



2021 Tennessee Drug Overdose Deaths

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

November 7, 2022

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Introduction and Purpose

The purpose of this brief report is to describe drug overdose deaths in Tennessee in 2021, 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 (CSMD).

Definitions

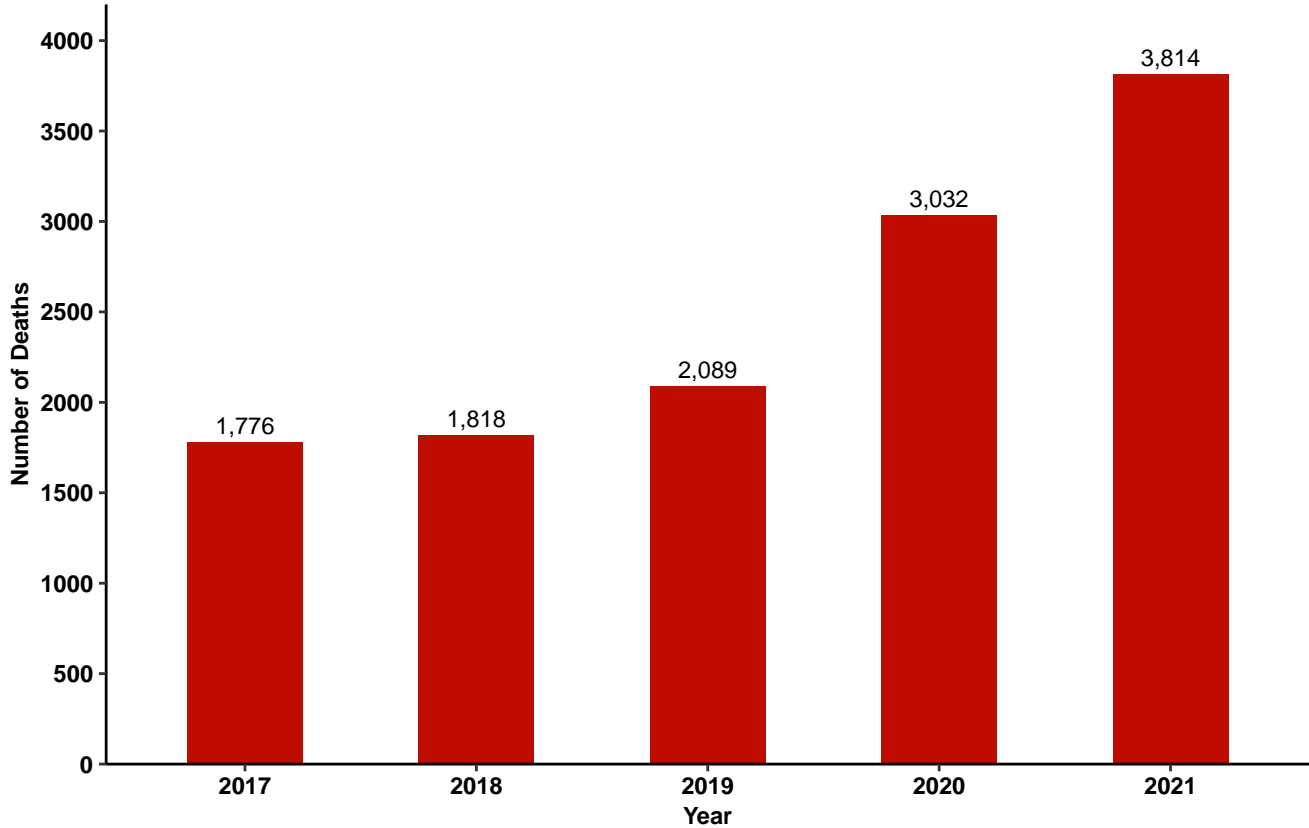
- Drug overdose (fatal and nonfatal)
 - A drug overdose is classified medically as a “drug poisoning.” An overdose may be fatal or nonfatal, and in Tennessee in 2020, approximately 9 nonfatal overdose discharges (both outpatient visits and inpatient stays combined) occurred for every identified fatal 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.²
- 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 (CSMD) 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[TDH drug overdose data dashboard](#)

²[TDH drug overdose mortality report, 2020](#)

State-level Overview 2017 - 2021

Drug Overdose Deaths in TN, 2017-2021

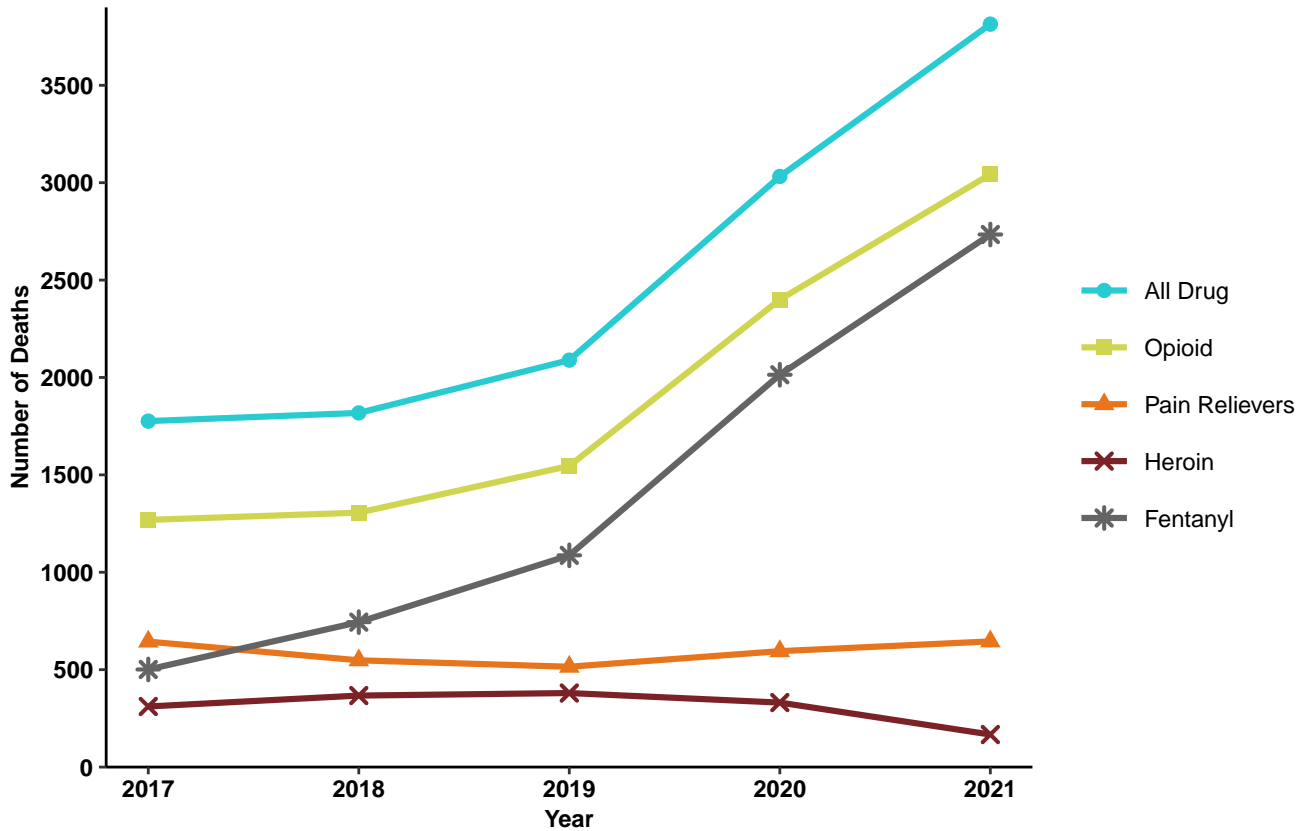


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

In 2021, a total of 3,814 Tennesseans died of a drug overdose, representing a 26% increase from 2020. Over the past five years, drug overdose deaths in Tennessee increased consistently, however, the increase from 2019 to 2020 is the largest observed during this period.

The intent, sometimes referred to as manner of death, is the general classification of how the injury led to the death. In 2021, about 97% of all drug overdose deaths (n=3,688) in TN were due to unintentional poisoning, while 2% of overdose deaths were intentional.

Number of Overdose Deaths by Drug Type in TN, 2017-2021



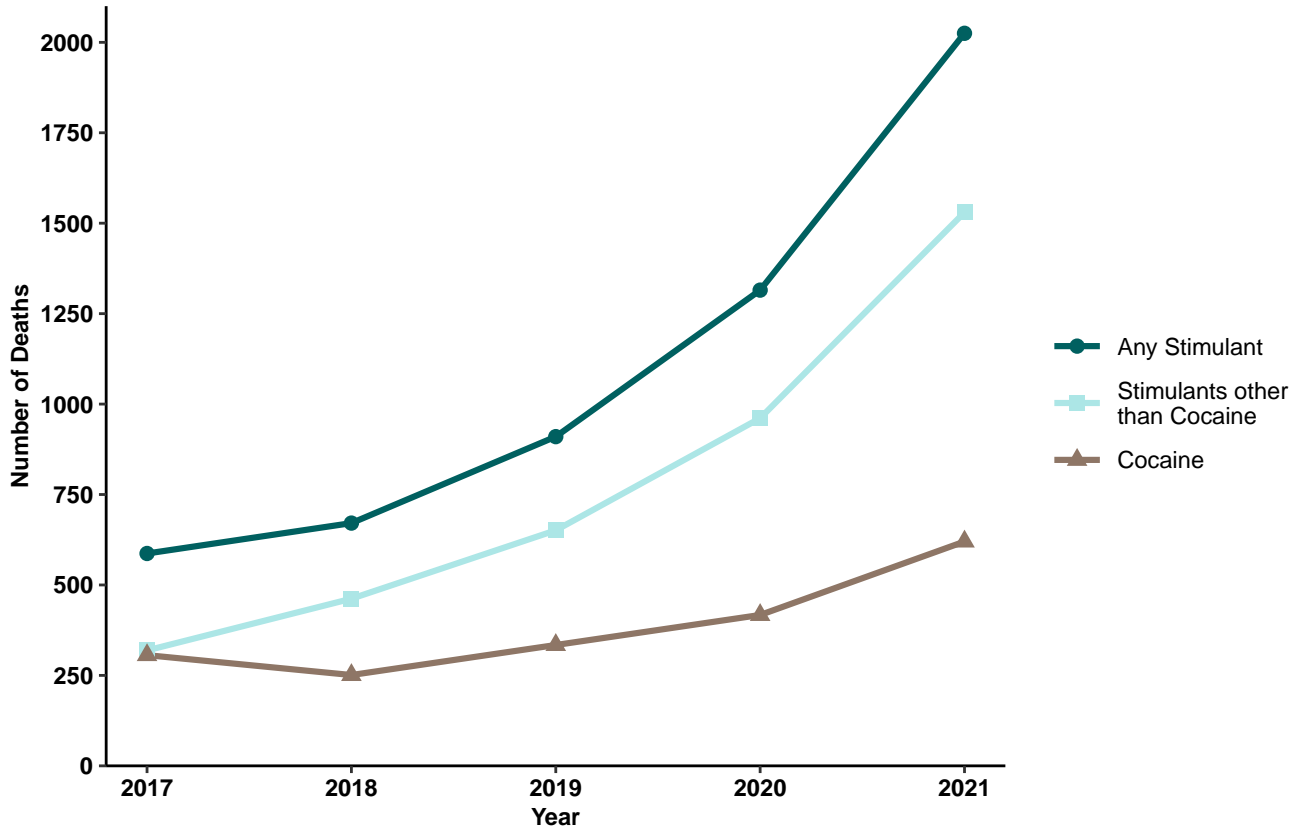
Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of Overdose Deaths in TN by Drug Type					
Type	2017	2018	2019	2020	2021
All Drug	1,776	1,818	2,089	3,032	3,814
Opioid	1,269	1,306	1,546	2,400	3,043
Pain Relievers	644	548	515	595	645
Heroin	311	367	380	331	167
Fentanyl	501	744	1,087	2,014	2,734

Opioids have consistently played a role in drug overdose deaths in Tennessee and were involved in 80% of overdose deaths in 2021. The increase in opioid overdose deaths is primarily driven by deaths involving illicit fentanyl. Deaths involving opioids identified as pain relievers (i.e., those typically obtained through a prescription) have increased slightly after several years of decline, while deaths involving heroin have decreased significantly after several years of increase prior.

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, 2017-2021

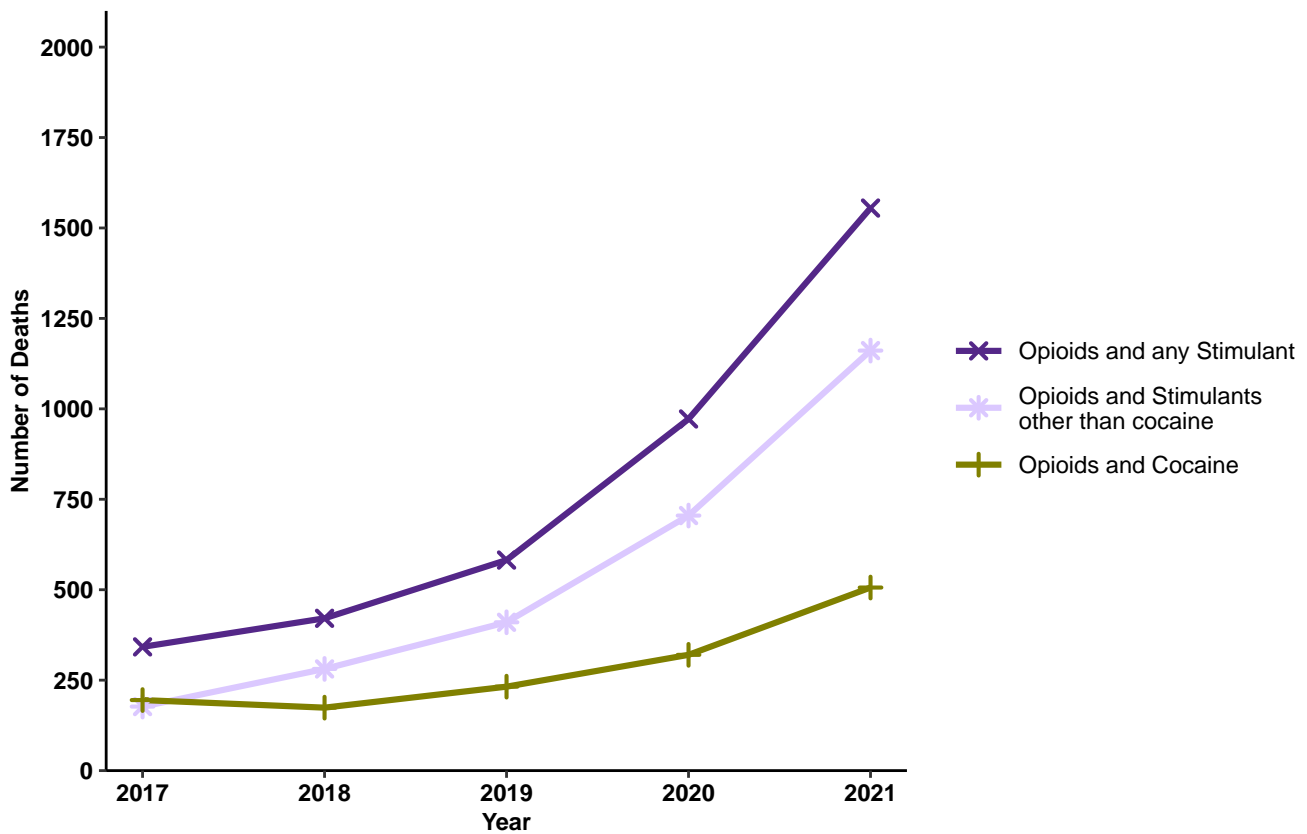


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of Stimulant Overdose Deaths in TN					
Type	2017	2018	2019	2020	2021
Any Stimulant	587	671	910	1,315	2,025
Stimulants other than Cocaine	319	462	651	961	1,530
Cocaine	306	251	334	417	620

Deaths involving any stimulants have consistently increased over the past five years: a 245% increase from 2017 to 2021. Deaths involving stimulants other than cocaine, a category that includes primarily deaths involving methamphetamine, have increased substantially over this period.

Number of Stimulant and Opioid Overdose Deaths in TN, 2017-2021

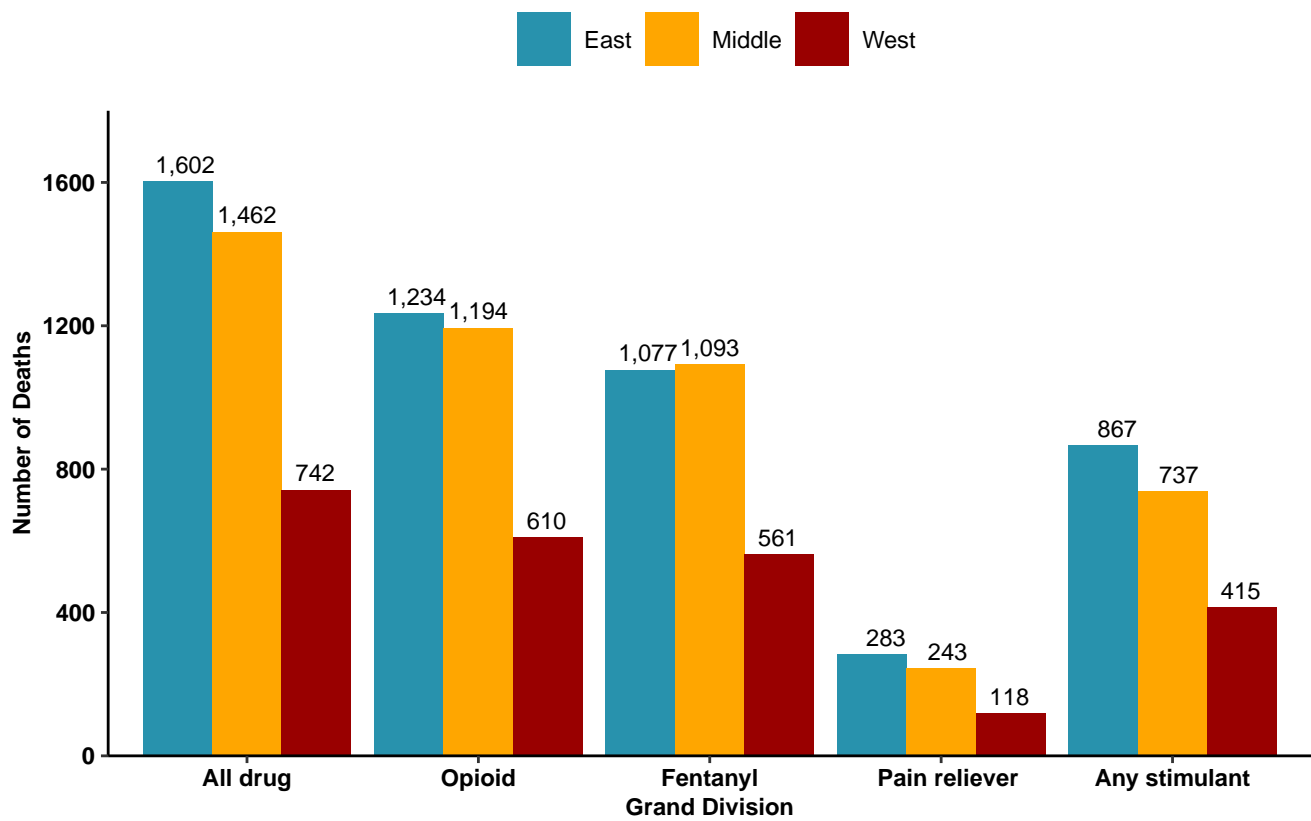


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of Stimulant and Opioid Overdose Deaths in TN					
Type	2017	2018	2019	2020	2021
Opioids and Any Stimulant	342	421	582	972	1,555
Opioids and Stimulants other than Cocaine	177	281	410	705	1,161
Opioids and Cocaine	195	174	232	320	506

Deaths involving both opioids and stimulants have also increased over the past five years. In 2021, 77% of stimulant-involved deaths also involved an opioid. Of these deaths (n=1,555), the opioid most frequently involved was fentanyl (94%).

Number of All Drug Overdose Deaths by Grand Division in TN, 2021

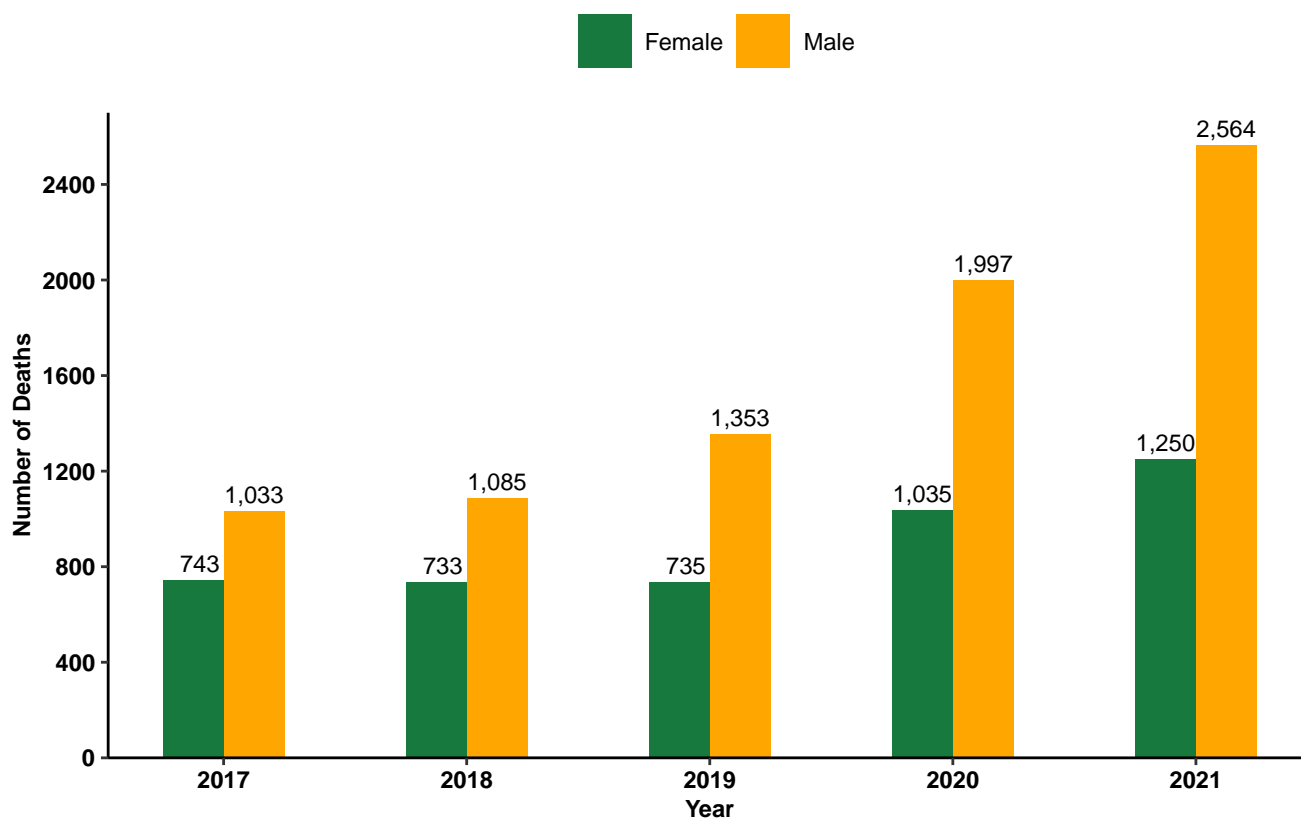


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of All Drug Overdose Deaths by Grand Division in TN					
GrandDivision	All drug	Opioid	Fentanyl	Pain reliever	Any stimulant
East	1,602	1,234	1,077	283	867
Middle	1,462	1,194	1,093	243	737
West	742	610	561	118	415

East TN had the highest number of overdose deaths, encompassing 42% of the deaths in 2021, followed by Middle and West grand divisions. The “Unknown” category is not shown in the graph.

Number of All Drug Overdose Deaths by Sex in TN, 2017-2021

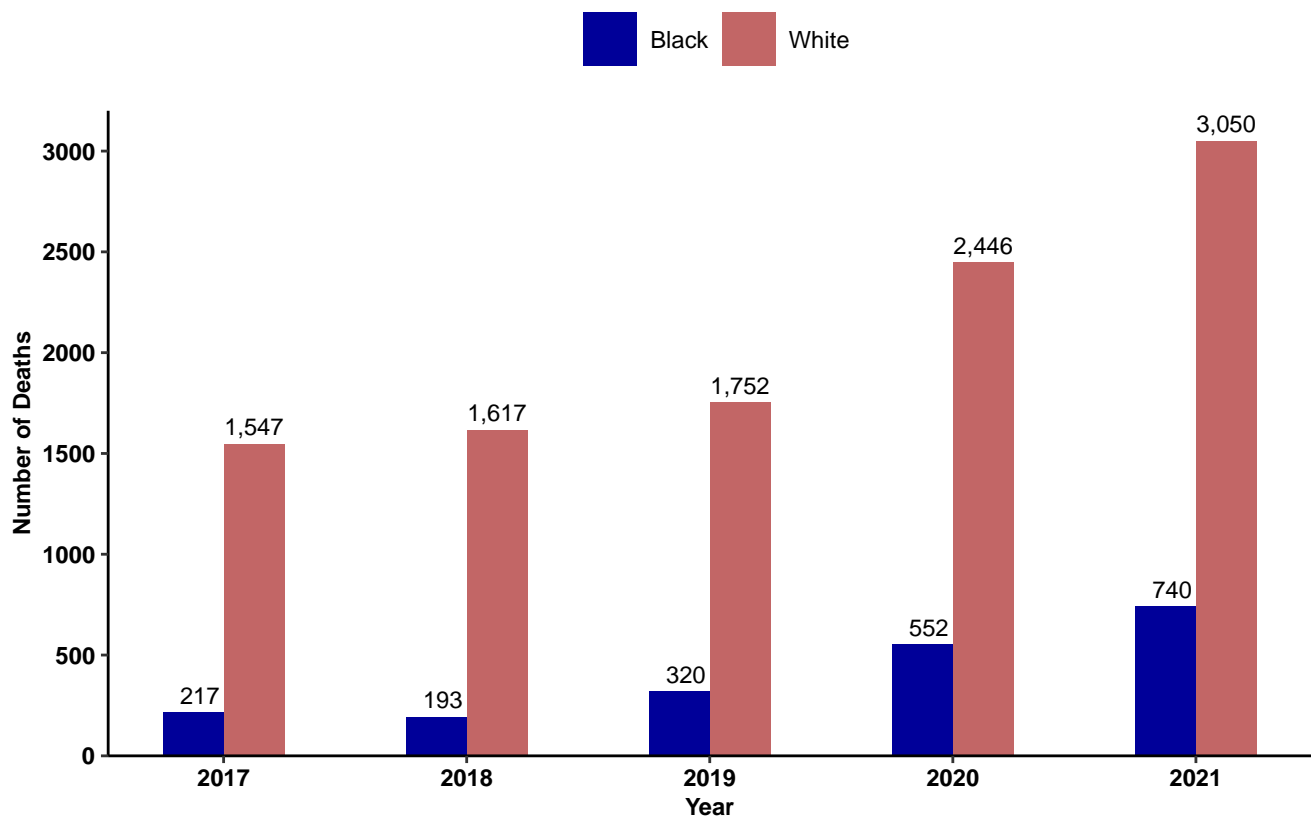


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of All Drug Overdose Deaths by Sex in TN					
Sex	2017	2018	2019	2020	2021
Female	743	733	735	1,035	1,250
Male	1,033	1,085	1,353	1,997	2,564

Males have made up an increasing proportion of overdose deaths over the past five years, and they now account for approximately two-thirds of all overdose deaths. The number of males who died of a drug overdose increased 28% between 2020 and 2021. Even though the number of females who died of a drug overdose remained relatively stable from 2017-2019, there was a 21% increase between 2020 and 2021.

Number of All Drug Overdose Deaths by Race in TN, 2017-2021

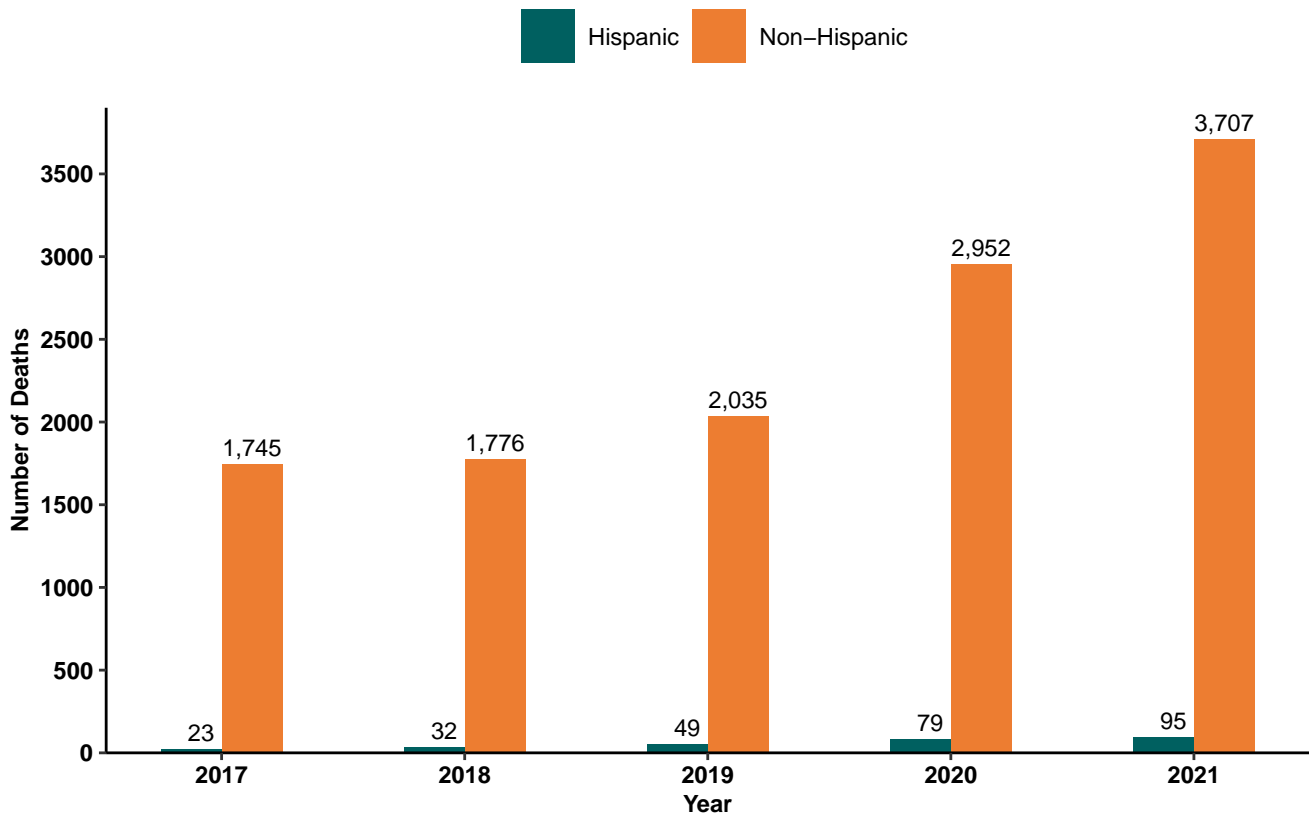


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of All Drug Overdose Deaths by Race in TN					
Race	2017	2018	2019	2020	2021
Black	217	193	320	552	740
White	1,547	1,617	1,752	2,446	3,050

Tennesseans who died from a drug overdose were more likely to be White, but the proportion of White Tennesseans who died of drug overdose has decreased from 87% in 2017 to 80% in 2021. Between 2020 and 2021, drug overdose deaths involving Black Tennesseans have increased 34%.

Number of All Drug Overdose Deaths by Ethnicity in TN, 2017-2021

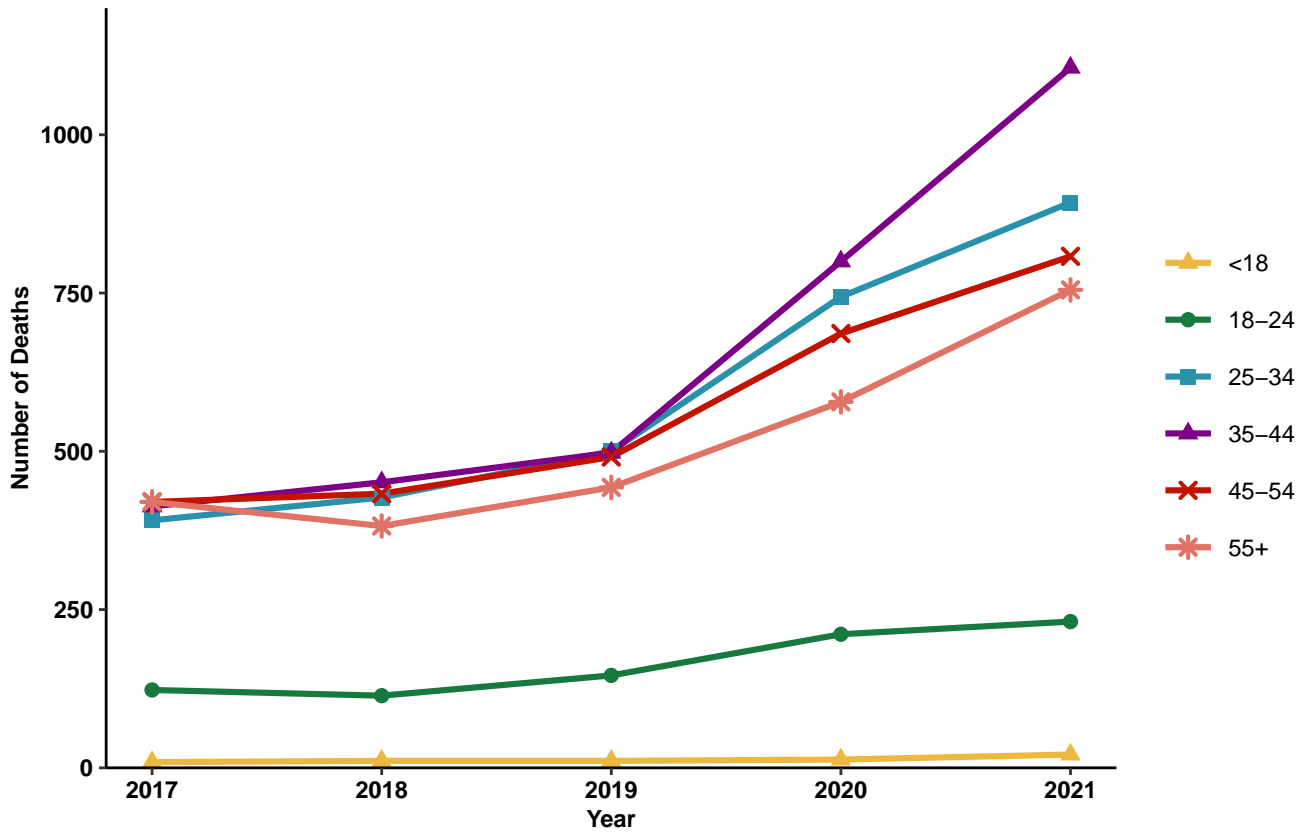


Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of All Drug Overdose Deaths by Ethnicity in TN					
Ethnicity	2017	2018	2019	2020	2021
Hispanic	23	32	49	79	95
Non-Hispanic	1,745	1,776	2,035	2,952	3,707

Between 2017 and 2021, drug overdose deaths involving Hispanic Tennesseans has increased 313%. Over the five year time period, deaths among Hispanic Tennesseans have primarily involved opioids (specifically fentanyl) and stimulants (both cocaine and methamphetamine). The “Unknown” category is not shown in the graph.

Number of All Drug Overdose Deaths by Age in TN, 2017-2021



Analysis by the Office of Informatics and Analytics, TDH (last updated October 27, 2022). Limited to TN residents.
Data Source: TN Death Statistical File.

Number of All Drug Overdose Deaths in TN by Age					
AgeCategory	2017	2018	2019	2020	2021
< 18	9	11	11	13	21
18 - 24	123	114	146	211	231
25 - 34	391	427	500	744	893
35 - 44	413	451	498	800	1,106
45 - 54	420	433	491	686	808
55+	420	382	443	578	755

From 2017 to 2021, overdose deaths have increased among all age groups. Between 2020 and 2021, persons aged 35-44 years had the highest percent increase (38%) of drug overdose deaths among these age groups.

Prescription History among Overdose Deaths for Tennessee Residents

Prescription History in the 365 Days Before Overdose Deaths in TN, 2017-2021

Percent who filled any prescription in the TN CSMD within 365 days of death by type of overdose death among all individuals who died, 2017-2021 (n_total=12,399, n_linked=10,678)					
Overdose Death	2017	2018	2019	2020	2021
All Drug	64	58	53	48	44
Opioid	66	58	53	47	44
Pain Relievers	76	69	63	62	60
Heroin	57	51	49	47	44
Fentanyl	54	50	49	44	42
Benzodiazepine	76	75	66	66	60
Opioid and Benzodiazepine	75	73	66	65	59

The Controlled Substance Monitoring Database (CSMD) provides insight on the degree to which Tennesseans who die of drug overdoses have received prescriptions for controlled substances. The table on this page shows the percentage of overdose decedents who filled any controlled substance prescription in the 365 day period before their death. Overdose deaths are further divided into categories by the drug involved in the death. For example, in 2021, 44% of individuals who died of an opioid overdose had filled any prescription (reported to the CSMD) in the past year, compared to 27% 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, 2017-2021

Percent who filled any prescription in the TN CSMD within 60 days of death by type of overdose death among all individuals who died, 2017-2021 (n_total=12,399, n_linked=10,678)

Overdose Death	2017	2018	2019	2020	2021
All Drug	43	38	34	31	27
Opioid	45	39	35	30	27
Pain Relievers	58	53	47	47	42
Heroin	28	30	28	29	23
Fentanyl	31	27	28	25	24
Benzodiazepine	57	61	52	51	46
Opioid and Benzodiazepine	56	59	52	50	45

The table on this page shows the percentage of overdose decedents who filled any controlled substance prescription in the 60 day period before their death. Overdose deaths are further divided into categories by the drug involved in the death. Over the five year period from 2017-2021, there has been a continual decrease in the percentage of decedents who filled a prescription in the CSMD in the 60 days before death for most categories. Whereas in 2017, 43% of overdose decedents had a filled prescription in the 60 days before death, by 2021 that number dropped to just 27%. These trends reflect the decrease of deaths involving prescription opioids and increase in deaths involving illicit opioids, the current driving force of the epidemic of overdose deaths.

Opioid and Benzodiazepine Prescription History in the 60 Days Before Overdose Deaths in TN, 2017-2021

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, 2017-2021 (n_total=12,399, n_linked=10,678)

Overdose Death	Opioid prescription filled					Benzodiazepine prescription filled				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
All Drug	34	26	22	19	17	21	20	15	14	11
Opioid	37	27	24	19	17	22	20	15	14	11
Pain Relievers	51	40	36	34	30	31	29	23	24	20
Heroin	22	22	18	18	12	10	13	13	11	8
Fentanyl	23	18	18	15	15	11	11	11	11	9
Benzodiazepine	44	38	30	29	23	39	47	38	38	34
Opioid and Benzodiazepine	45	40	32	29	23	37	45	38	38	32

The table above shows the percentage of overdose decedents who filled an opioid or benzodiazepine prescription in the 60 day period before their death. Overdose deaths are further divided into categories by the drug involved in the death. For example, in 2021, 17% of all drug overdose decedents had filled an opioid prescription in the 60 days before death, a 50% decrease from 2017.

2021 County Level Data

The following pages include county data on the number of overdose deaths in 2021 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.

2021 Overdose Death Counts by County

2021 Overdose Death Counts by County						
County	Alldrug	Opioid	Painreliver	Heroin	Fentanyl	Any Stimulant
Anderson	91	80	18	7	69	55
Bedford	24	17	5	0	15	13
Benton	6	3	3	0	2	3
Bledsoe	8	5	1	0	4	5
Blount	95	77	19	6	67	38
Bradley	51	32	5	1	29	25
Campbell	24	17	3	2	15	10
Cannon	11	9	4	0	9	5
Carroll	4	0	0	0	0	2
Carter	26	21	8	2	15	16
Cheatham	31	28	6	2	26	17
Chester	5	1	0	0	1	3
Claiborne	9	3	1	0	2	3
Clay	5	2	1	0	0	3
Cocke	28	25	6	2	22	12
Coffee	25	16	5	1	13	18
Crockett	2	1	0	1	1	1
Cumberland	47	39	13	1	33	32
Davidson	529	456	76	17	434	263
Decatur	5	2	0	0	2	4
DeKalb	16	9	1	0	9	12
Dickson	41	38	9	3	36	19
Dyer	8	3	1	0	2	1
Fayette	19	14	3	0	12	8
Fentress	11	9	4	0	5	5
Franklin	9	5	2	0	4	1
Gibson	19	10	2	0	9	11
Giles	11	9	2	0	8	8
Grainger	19	8	0	1	8	12
Greene	45	29	11	1	22	27
Grundy	7	3	1	0	3	5
Hamblen	41	35	11	2	24	21
Hamilton	171	132	11	8	121	92
Hancock	2	2	0	0	2	0
Hardeman	5	3	1	0	3	4
Hardin	12	8	1	1	6	7
Hawkins	24	16	3	1	13	17
Haywood	1	1	0	0	1	0

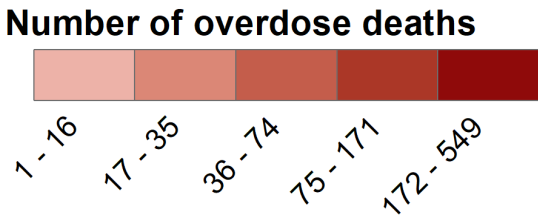
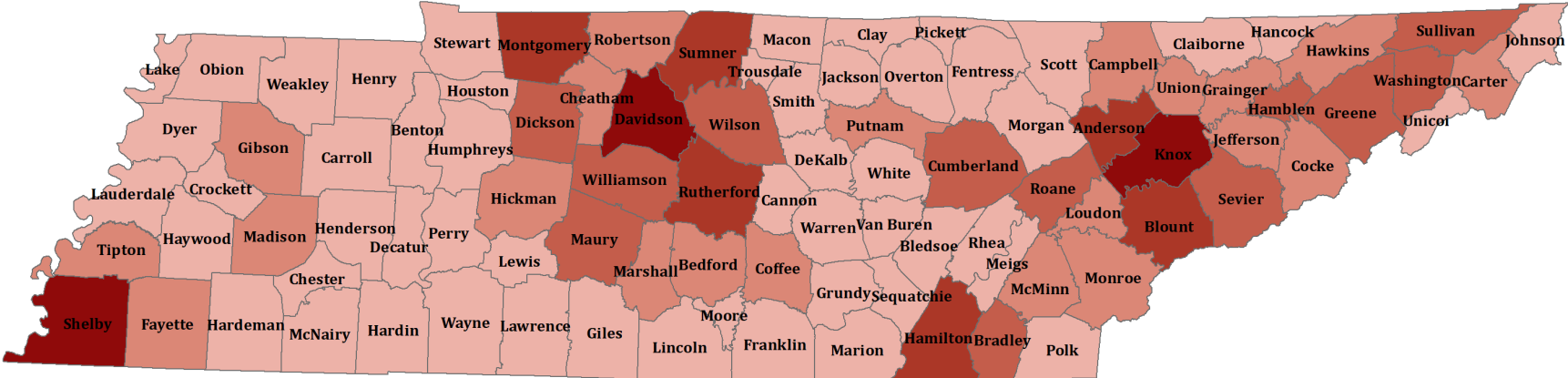
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2021 Overdose Death Counts by County						
County	Alldrug	Opioid	Painreliver	Heroin	Fentanyl	Any Stimulant
Henderson	5	5	1	0	5	0
Henry	10	9	2	0	6	1
Hickman	24	19	1	2	18	17
Houston	4	3	0	0	3	0
Humphreys	7	6	1	1	4	2
Jackson	6	5	1	0	4	4
Jefferson	30	17	4	1	15	15
Johnson	9	5	1	1	4	8
Knox	452	381	79	33	351	249
Lake	3	2	1	0	2	2
Lauderdale	1	1	0	0	1	1
Lawrence	16	10	2	0	10	9
Lewis	9	5	1	0	5	7
Lincoln	7	5	1	0	3	4
Loudon	34	29	6	3	26	18
McMinn	29	10	4	0	9	10
McNairy	13	8	5	0	5	6
Macon	8	4	0	0	3	5
Madison	35	27	3	2	24	21
Marion	11	10	1	0	7	7
Marshall	19	17	5	1	15	11
Maury	52	39	9	0	35	27
Meigs	9	2	1	0	2	3
Monroe	28	21	10	1	15	15
Montgomery	117	106	22	9	95	50
Moore	1	1	1	0	0	0
Morgan	13	9	1	1	9	10
Obion	5	3	1	0	1	2
Overton	9	6	2	1	5	5
Perry	3	3	2	0	2	1
Pickett	4	2	2	0	0	2
Polk	5	3	0	0	2	1
Putnam	22	15	4	0	13	14
Rhea	12	5	1	1	5	9
Roane	50	41	12	0	33	23
Robertson	32	28	6	1	25	20
Rutherford	141	121	26	8	110	61
Scott	3	1	0	1	0	1
Sequatchie	7	5	1	0	5	4
Sevier	72	62	13	6	60	37
Shelby	549	488	90	15	458	320
Smith	9	7	3	0	6	5
Stewart	11	9	2	0	9	8
Sullivan	74	54	20	2	48	44
Sumner	93	66	16	2	60	35
Tipton	28	19	4	1	18	13
Trousdale	5	4	0	0	3	1
Unicoi	10	7	6	0	3	7

(continued)

2021 Overdose Death Counts by County						
County	Alldrug	Opioid	Painreliver	Heroin	Fentanyl	Any Stimulant
Union	22	12	1	3	10	10
Van Buren	3	2	2	0	2	2
Warren	10	6	0	0	6	7
Washington	58	44	13	3	32	35
Wayne	5	4	0	1	3	3
Weakley	7	2	0	1	2	5
White	14	6	1	0	6	10
Williamson	41	36	5	3	33	17
Wilson	63	53	11	3	48	37
Unknown	8	5	1	1	3	6
Tennessee	3,814	3,043	645	167	2,734	2,025

Map: 2021 All Drug Overdose Deaths in TN Counties



Technical Notes: Tennessee 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 Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: 'FENTAN', 'FENTA', 'FANTAN' when no opioid code is available
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