



Tennessee State Unintentional Drug Overdose Reporting System (SUDORS) Report 2023

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

February 27, 2023

Contents

1	Executive Summary	2
2	Introduction: What is SUDORS?	3
2.1	SUDORS Data	3
2.2	Case Definition	3
	Demographic Distribution among SUDORS Deaths in Tennessee, 2019 - 2021	5
2.3	Total SUDORS Overdoses in Tennessee	5
2.4	Age-Specific SUDORS Death Rate in Tennessee	6
2.5	Age-Adjusted SUDORS Death Rate by Race in Tennessee	7
2.6	Age-Adjusted SUDORS Death Rate by Sex in Tennessee	8
2.7	Marital Status among SUDORS Deaths in Tennessee	9
2.8	Highest Education Level Among SUDORS Deaths in Tennessee	10
3	Toxicology among SUDORS Deaths in Tennessee, 2019 - 2021	11
3.1	Drug Classes among SUDORS Decedents in Tennessee	11
3.2	Individual Substances among SUDORS Decedents in Tennessee	12
4	Circumstances among SUDORS Deaths in Tennessee, 2019 - 2021	13
4.1	Evidence of Substance Use Disorder History among SUDORS Decedents in Tennessee	13
4.2	Injury Location of SUDORS Decedents in Tennessee	14
4.3	EMS Presence at Scene for SUDORS Deaths in Tennessee	15
4.4	Percent of SUDORS Decedents Treated in the Emergency Department in Tennessee	16
4.5	Death Location of SUDORS Decedents in Tennessee	17
4.6	Bystander Presence at Time of Overdose for SUDORS Deaths in Tennessee	18
4.7	Percent of SUDORS Deaths with Evidence of Naloxone Administration in Tennessee	19
5	Conclusion	20
5.1	Additional Data Resources	20
5.2	Resources for Treatment and Prevention	20



Department of Health Authorization No. 355880
 This Electronic publication was promulgated at zero cost.
 March 2023.

1 Executive Summary

In Tennessee, 8,729 individuals died of an accidental or undetermined drug overdose between 2019-2021. SUDORS deaths increased 87% from 2019 to 2021.

- The largest increase in age-adjusted death rate occurred for individuals aged 35-44 years.
- The age-adjusted death rate for Black individuals increased 150% between 2019 and 2021.
- Illicit opioids and stimulants accounted for the highest proportions of deaths 75.1% and 56.5% respectively in 2021. Fentanyl was the most frequently occurring substance on toxicology.
- Most decedents died at home, but only 22% of decedents had a bystander present in 2021 who could have intervened during the overdose.
- Only 24% of decedents had evidence of naloxone administration.

With increased in fentanyl involvement, naloxone training and distribution are critical to decreasing fatal overdoses. Family, friends, and the general public should know how to administer naloxone in case an individual who uses drugs has an overdose. Research on prevention and intervention strategies should continue focusing on ethnic minorities and culturally relevant treatment and prevention options. The SUDORS team plans to conduct future analyses to determine if treatment options are available near individuals who need it most.

2 Introduction: What is SUDORS?

Unintentional injuries are the leading cause of death for individuals under 45 years old in the United States. Drug overdoses comprise most of these deaths. Since 1999, there have been close to 841,000 deaths from drug overdoses in the United States. With the number of drug overdoses rising every year, the Centers for Disease Control and Prevention (CDC) provided funding to states in 2016 under the Enhanced State Opioid Overdose Surveillance (ESOOS) grant to enhance surveillance and bolster prevention efforts of opioid overdoses. Tennessee began participating in ESOOS in 2018 and started collecting data on undetermined and unintentional opioid overdoses in Tennessee as part of the State Unintentional Drug Overdose Reporting System (SUDORS). SUDORS uses death certificate data, autopsies, toxicology reports, and Prescription Drug Monitoring Program data (PDMP) to collect over 600 variables relating to the overdose and the decedent.

SUDORS became a subset of the already established National Violent Death Reporting System (NVDRS), which collects similar data for all violent deaths, not just overdoses. SUDORS and NVDRS share a web-based platform for collecting and storing the data as well as all undetermined drug overdose deaths. Despite these undetermined cases overlapping between both NVDRS and SUDORS, and their shared platform, SUDORS is a unique strategy under the Overdose Data to Action Grant (OD2A), which replaced ESOOS in 2019. The OD2A grant began collecting overdose deaths from January 2019 onward and expanded SUDORS to collect information on all overdose deaths, not just opioid overdose deaths.

2.1 SUDORS Data

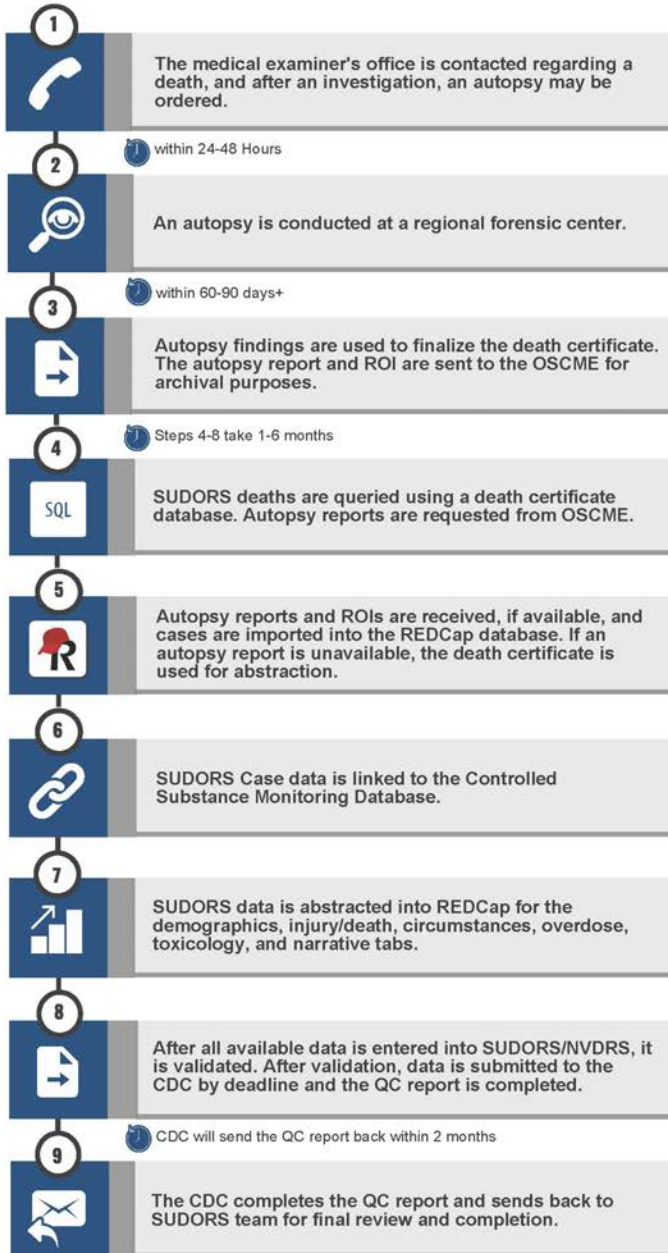
SUDORS data is collected in six-month periods from January-June and then from July-December and is reported to the CDC biannually in February and August. Because SUDORS uses autopsy and toxicology data, there is a delay in the availability of finalized data. Tennessee is a decentralized state with five regional forensic centers and the state agency serving as an advisor. Autopsies available for SUDORS abstraction are limited to those sent from the five centers to the state agency. SUDORS data is entered into the secured CDC database that stores the rest of the NVDRS data, but it is first abstracted and entered into a platform called the Research Electronic Data capture (REDCap), which the Tennessee SUDORS team uses for data management.

2.2 Case Definition

SUDORS cases are found using an algorithm that searches the death certificate database for ICD-10 poisoning and overdose codes (X40-X44, Y10-Y14, T36-T50) and drugs listed as a cause of death in the cause of death text fields. The algorithm was designed to maximize the sensitivity so that all possible cases would be identified. Abstractors manually go through each case using all available information to exclude any cases not meeting the case definition. SUDORS cases have an underlying cause of death of acute drug toxicity. The manner of death is usually unintentional or undetermined, although there are some natural manner of death in cases where a physician fills out the death certificate. A drug is defined in the SUDORS coding manual as, “any chemical compound that is chiefly used by or administered to humans or animals as an aid in the diagnosis, treatment, or prevention of disease or injury, for the relief of pain or suffering, to control or improve any physiologic or pathologic condition, or for the feeling it causes.”



SUDORS Data Collection Process

KEY

QC - Quality Control

SUDORS - State Unintentional Drug Overdose Reporting System

ROI - Report of Investigation

OSCME - Office of the State Chief Medical Examiner

NVDRS - National Violent Death Reporting System

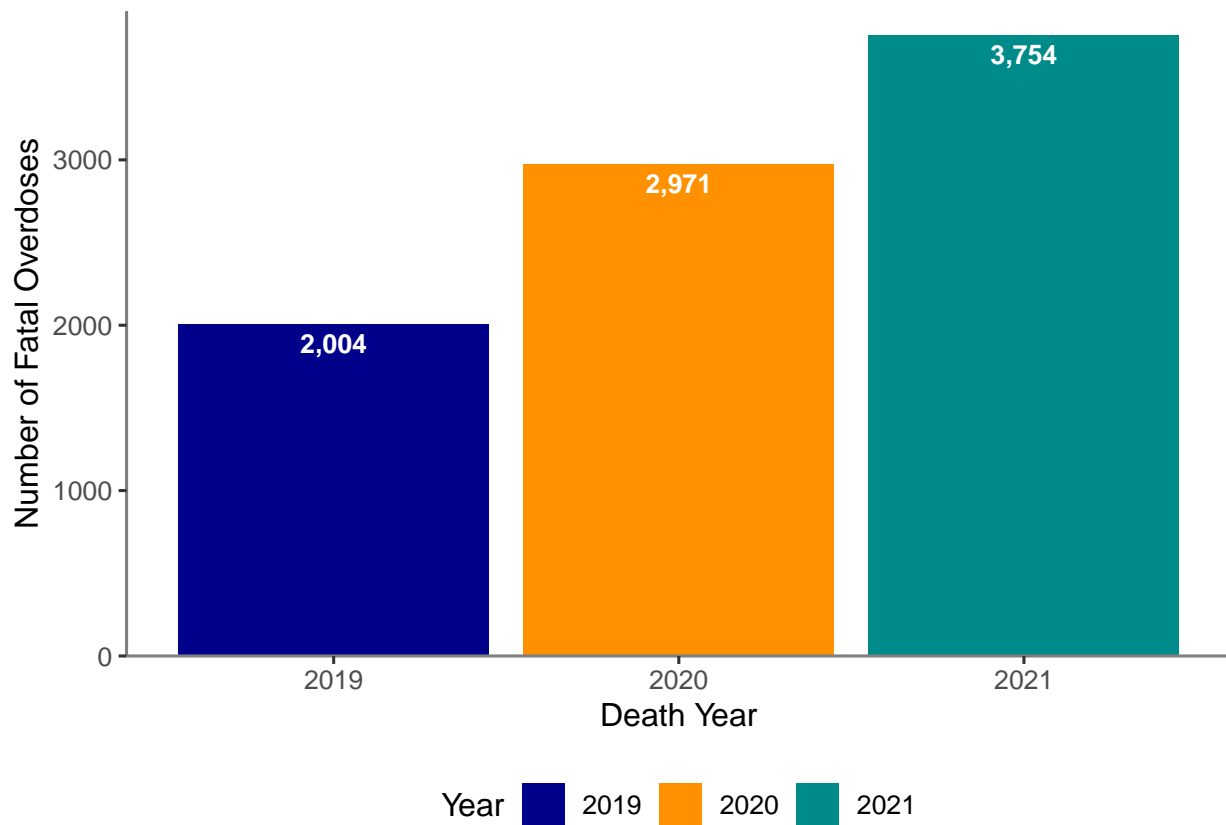
REDCap- Research Electronic Data Capture

This infographic was prepared by the Office of Informatics and Analytics and OSCME in October 2022.

Demographic Distribution among SUDORS Deaths in Tennessee, 2019 - 2021

SUDORS collects demographic information for each decedent, including age, race, sex, marital status, and education level. This information is important for tailoring prevention strategies to the population most impacted. The rate data presented is calculated per 100,000 Tennessee residents.

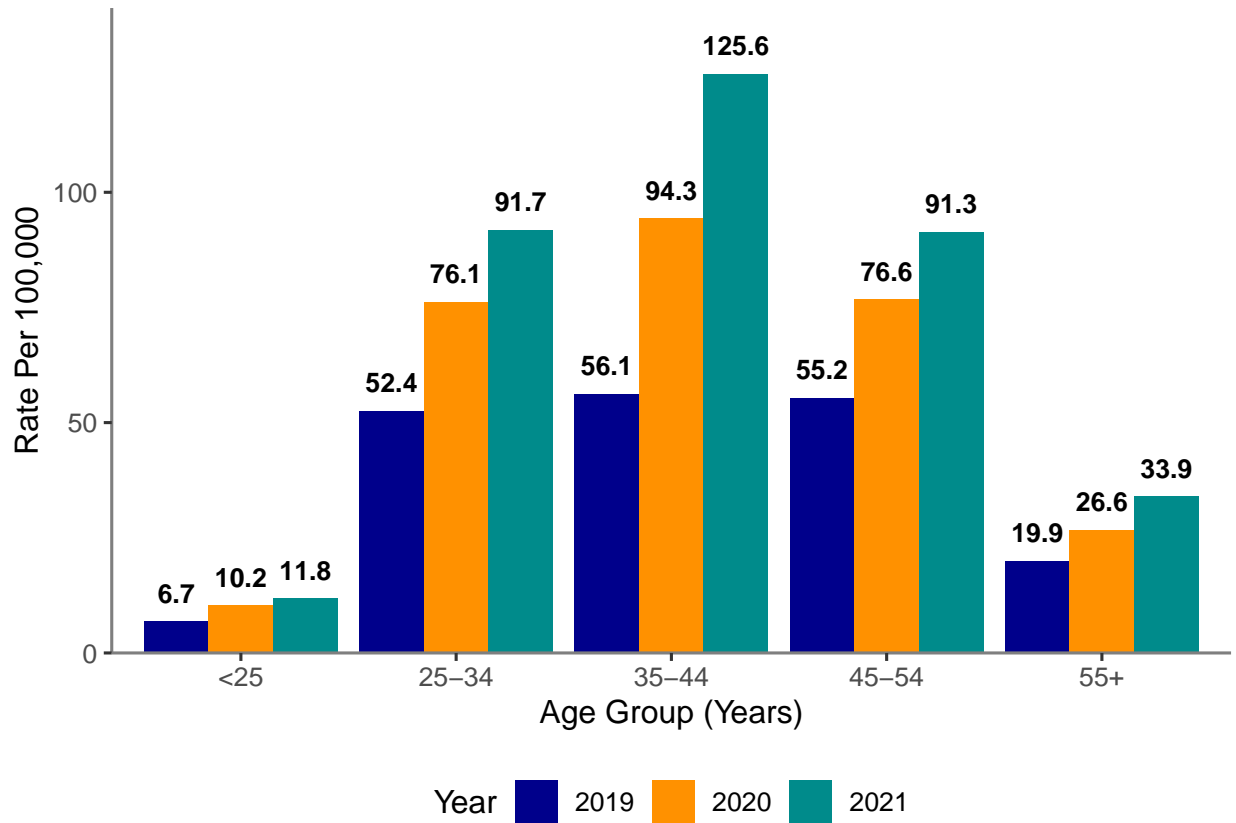
2.3 Total SUDORS Overdoses in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021.

Between 2019 and 2021, 8,729 deaths met the the SUDORS case definition. SUDORS deaths increased by 26% between 2020 to 2021. Currently, the SUDORS team is assessing how the COVID-19 pandemic impacted drug overdose deaths in Tennessee.

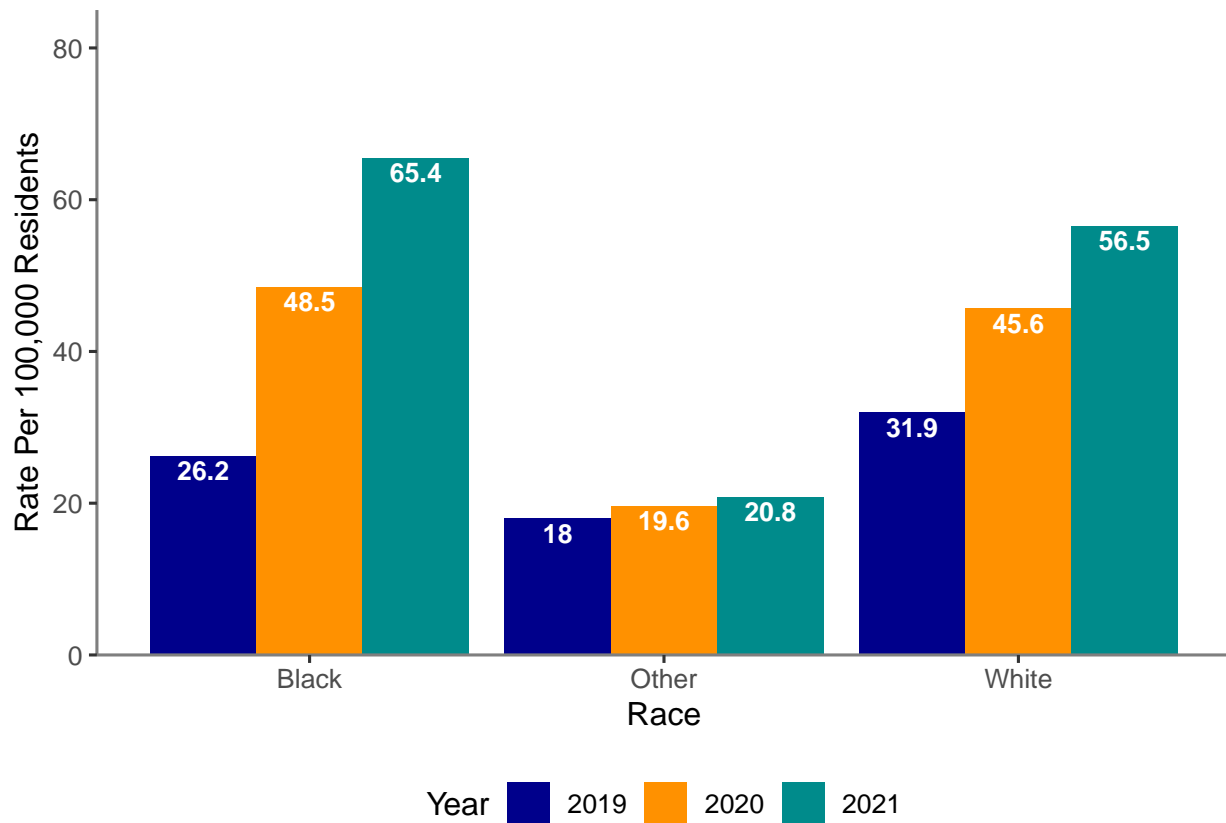
2.4 Age-Specific SUDORS Death Rate in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021.

Age-specific death rates increased for all age categories between 2019 and 2021. The most striking increase occurred for individuals aged 35-44 years. The smallest increase occurred for individuals <25 years of age.

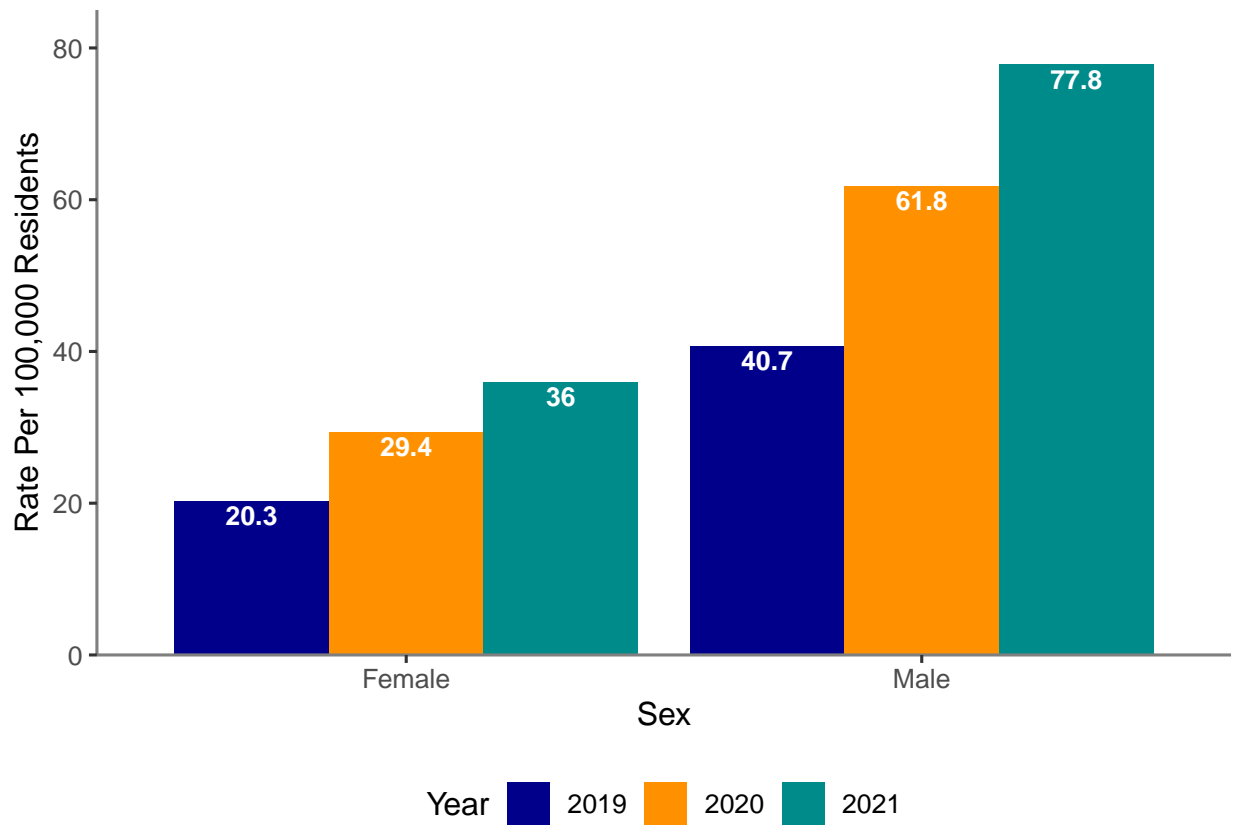
2.5 Age-Adjusted SUDORS Death Rate by Race in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021.

Age-adjusted death rates for all races increased between 2019 and 2021. Black individuals experienced a higher death rate compared to White individuals (65.4 vs. 56.5) in 2021. Black individuals also experienced a 150% increase in death rate between 2019 and 2021, while White individuals experienced a 77% increase in the same time period. The death rate for other race individuals remained relatively constant.

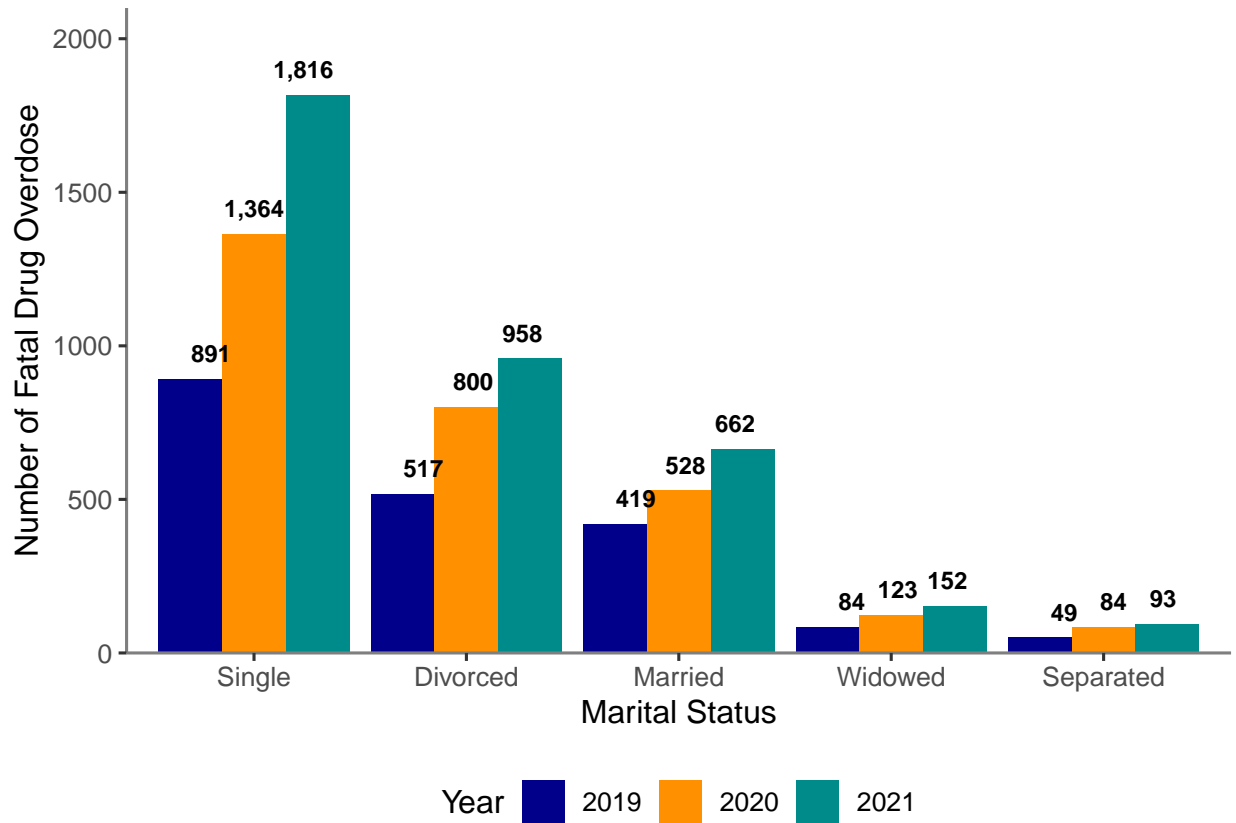
2.6 Age-Adjusted SUDORS Death Rate by Sex in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021.

Males experienced a higher age-adjusted death rate compared to females for all years. Males also experienced a greater percent change between 2019 and 2021 compared to females (91% vs. 77%).

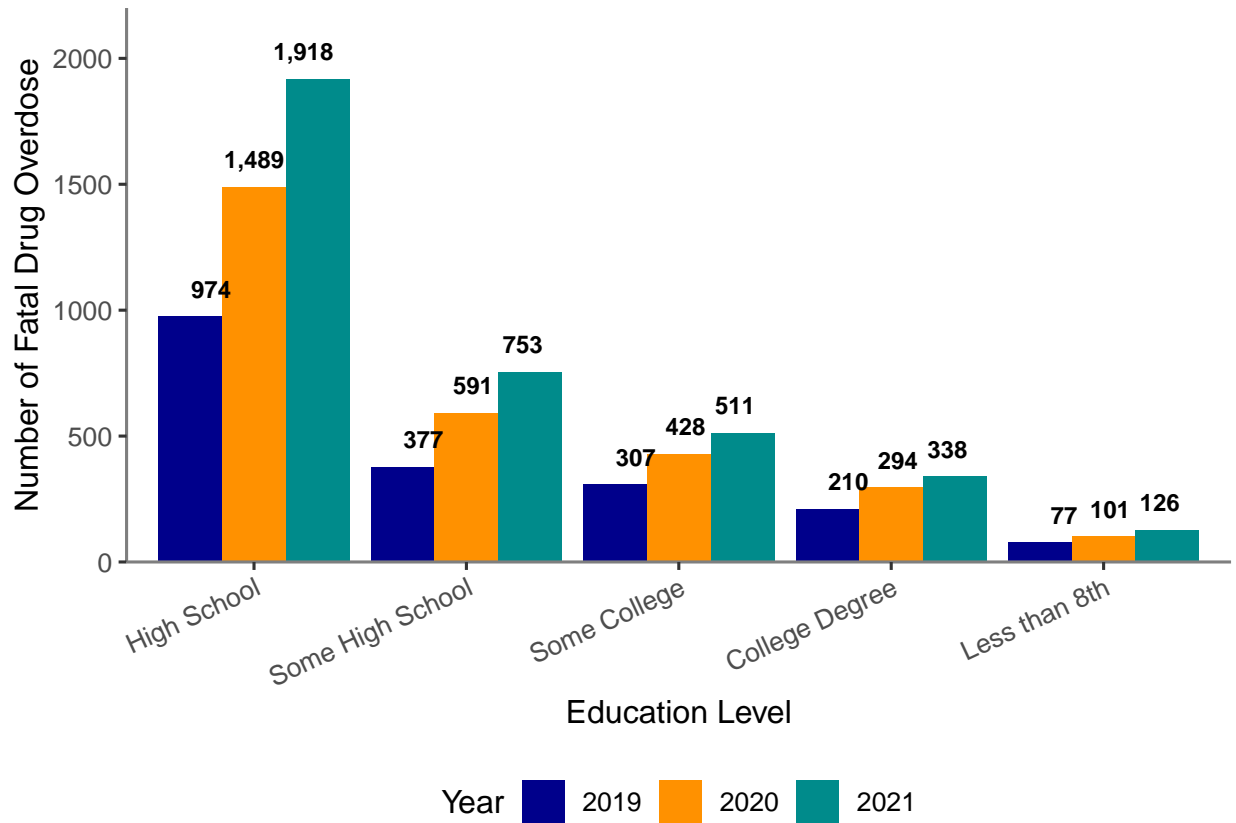
2.7 Marital Status among SUDORS Deaths in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021.

When looking at 2019 to 2021 data together, only 18% of SUDORS decedents were married at the time of death. A similar pattern occurred between 2019 and 2021 for all types of marital status. We did not include the category “Unknown” in the graph.

2.8 Highest Education Level Among SUDORS Deaths in Tennessee



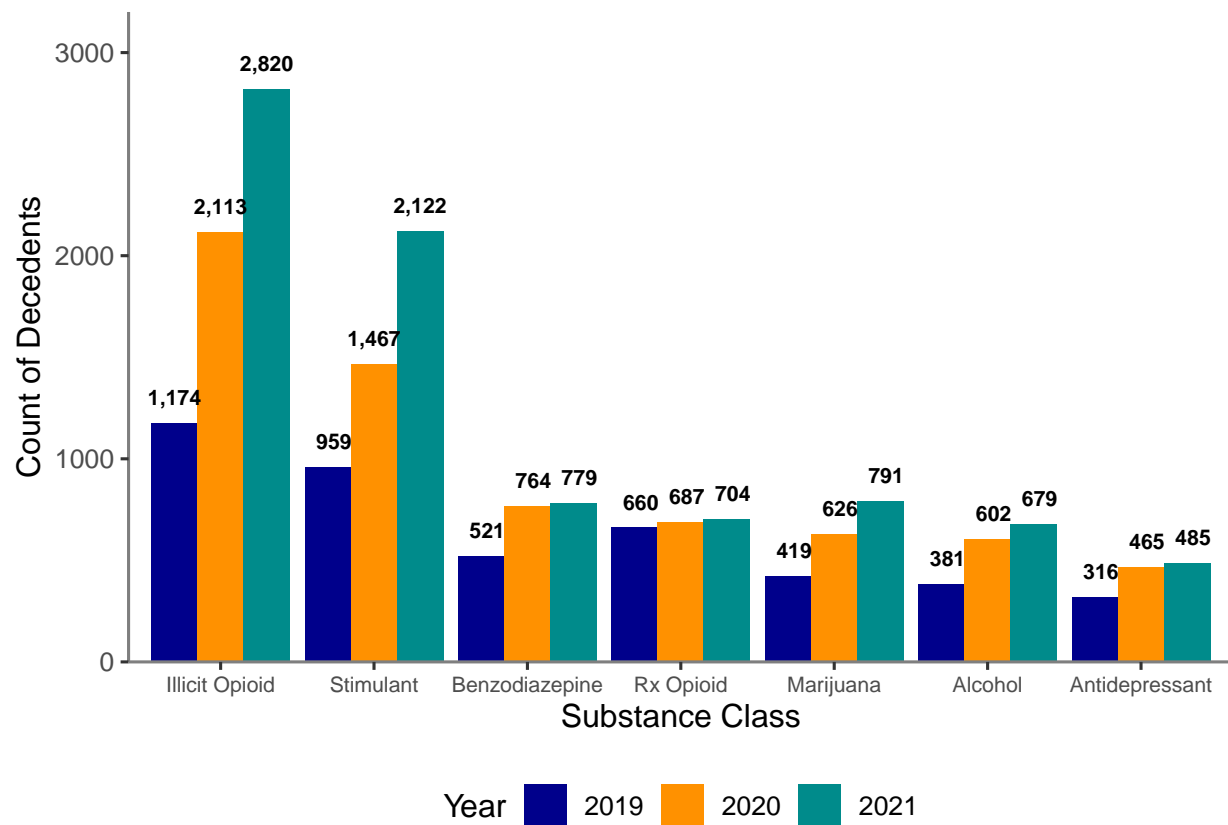
Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021.

Most SUDORS decedents had at least a high school education or General Educational Development (GED) equivalent for deaths from 2019-2021. A similar pattern occurred between 2019 and 2021 for all education levels. We did not include the category “Unknown” in the graph.

3 Toxicology among SUDORS Deaths in Tennessee, 2019 - 2021

Toxicology reports are a key component of data collected for SUDORS. Toxicology reports generally accompany an autopsy report and give detailed information about all substances an individual had in their system at the time of death. If a toxicology report is not available, substances from the death certificate are used to determine substances involved in a death. The following figures show the most common drug classes and individual substances present in 2019-2021 SUDORS data.

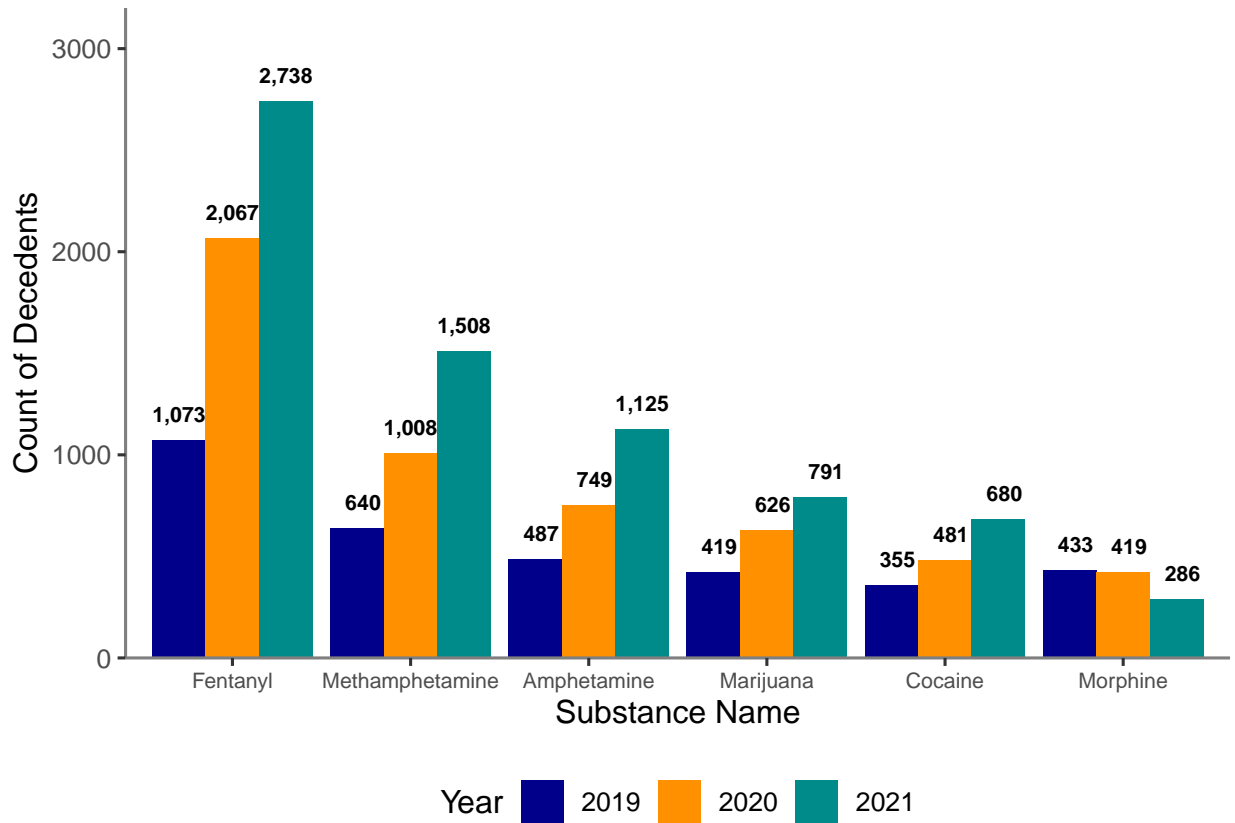
3.1 Drug Classes among SUDORS Decedents in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

The graph above shows the most common drug classes for substances found in toxicology reports for Tennessee SUDORS deaths between 2019 and 2021. The most common drug class seen was illicit opioids. The pattern from the most common drug class found in SUDORS decedents to the least common remained relatively consistent between three years.

3.2 Individual Substances among SUDORS Decedents in Tennessee



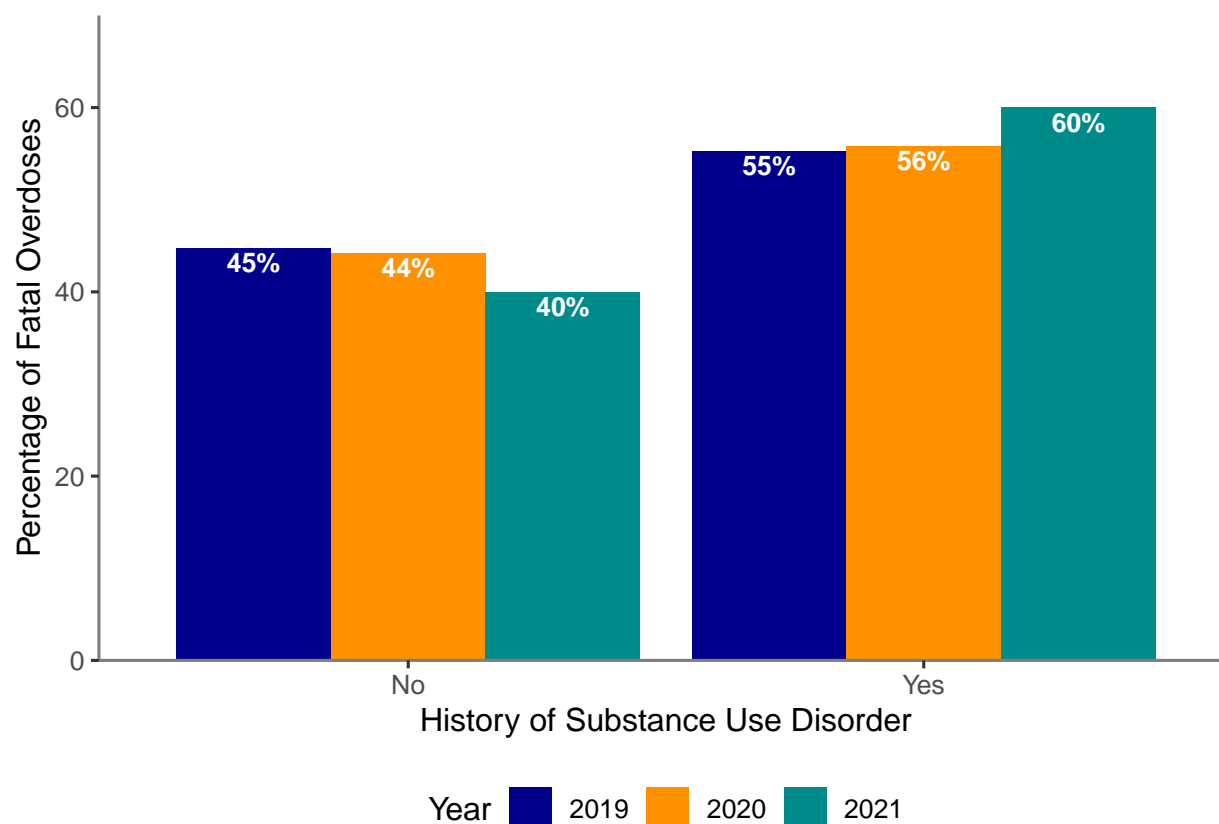
Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

The graph above shows the most prevalent substances found in toxicology reports for Tennessee SUDORS deaths between 2019 and 2021. Fentanyl was the most common substance involved in SUDORS deaths. While morphine involvement decreased in 2021.

4 Circumstances among SUDORS Deaths in Tennessee, 2019 - 2021

One of the strengths of SUDORS data is the rich information regarding the circumstances surrounding the fatal overdose event. SUDORS collects information on numerous variables describing the circumstances surrounding an overdose death. This section highlights key variables to provide more insight into fatal overdoses in Tennessee. Circumstantial data come primarily from investigative summaries found within autopsy reports and reports of investigation for cases that were not autopsied. Due to the lack of detailed information in some autopsies and reports of investigation, these data can be underestimated or limited for some decedents. The SUDORS team generally receives autopsies for 70-80% of cases.

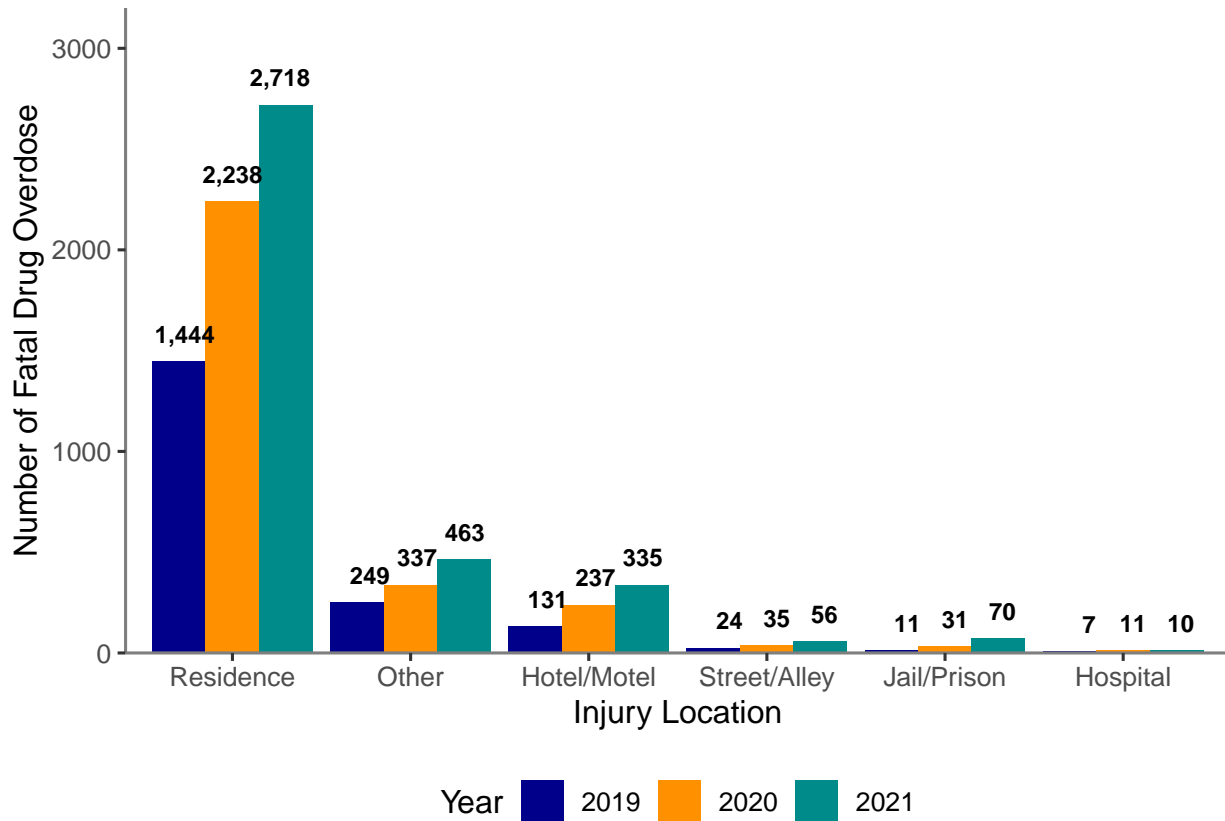
4.1 Evidence of Substance Use Disorder History among SUDORS Decedents in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

SUDORS manual defines substance use disorder as a previous history of drug use or misuse, relapse after abstinence, current or past treatment for substance use, previous overdose, recent emergency department visits and/or involvement with the criminal justice system that involves a substance. Among the 8,729 overdose deaths in Tennessee between 2019 and 2021, 57% of decedents had a history of substance use disorder. Annual percentages and the proportion of history of substance use disorder versus none remained relatively consistent between 2019 and 2021. This information is provided in narrative summaries within autopsy reports, either from medical records or reports from loved ones.

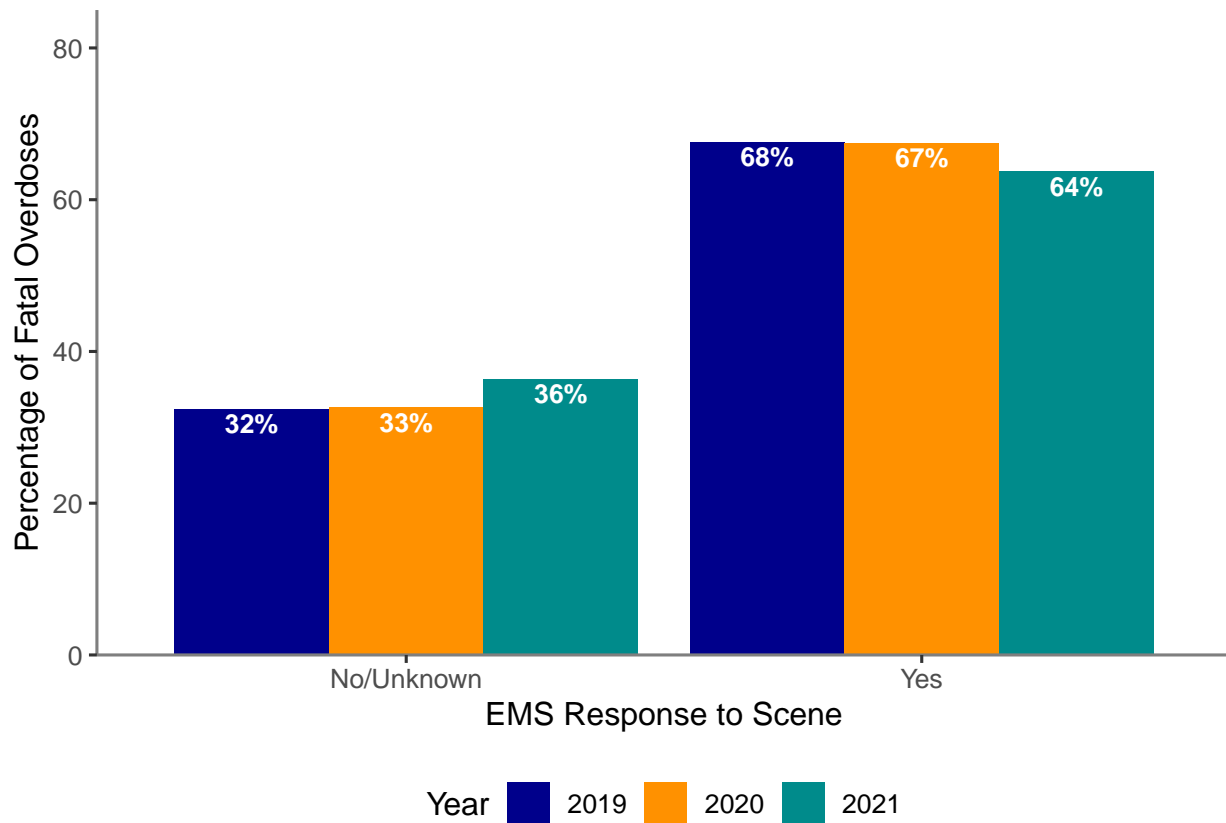
4.2 Injury Location of SUDORS Decedents in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

In Tennessee, 73% of all fatal overdoses begin at a residential location, such as a house or apartment. Overdoses occurring at a hotel or motel were the third highest among injury locations reported in Tennessee. Other injury locations, including outside in a natural area or commercial establishments, such as grocery stores, laundromats, or parking lots, accounted for the second most common area found. The “Unknown” category is not shown in the graph.

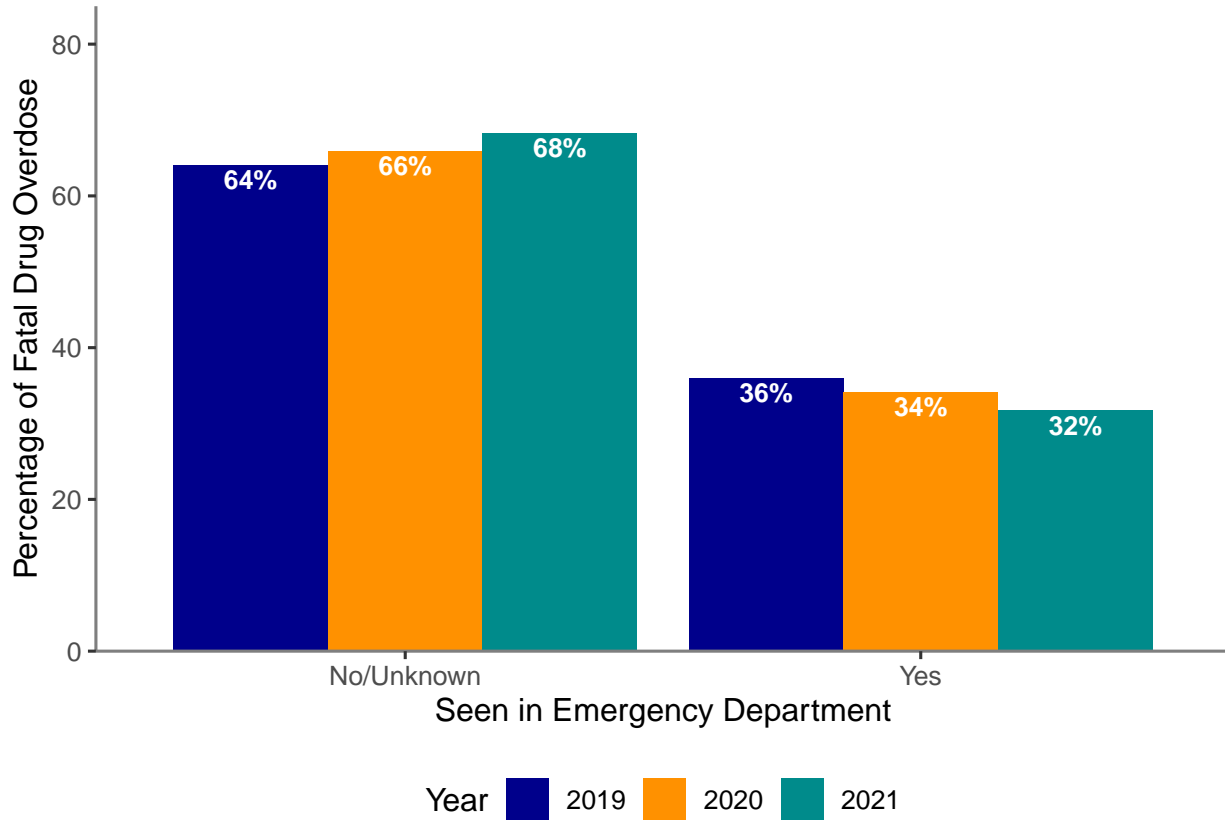
4.3 EMS Presence at Scene for SUDORS Deaths in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

Emergency medical personnel, including EMS and fire departments, responded to 64% of SUDORS deaths in 2021. Annual percentages and the proportion of EMS response versus no response or unknown remained relatively consistent between 2019 and 2021. These numbers could be underestimated due to lack of autopsy report or details describing the scene.

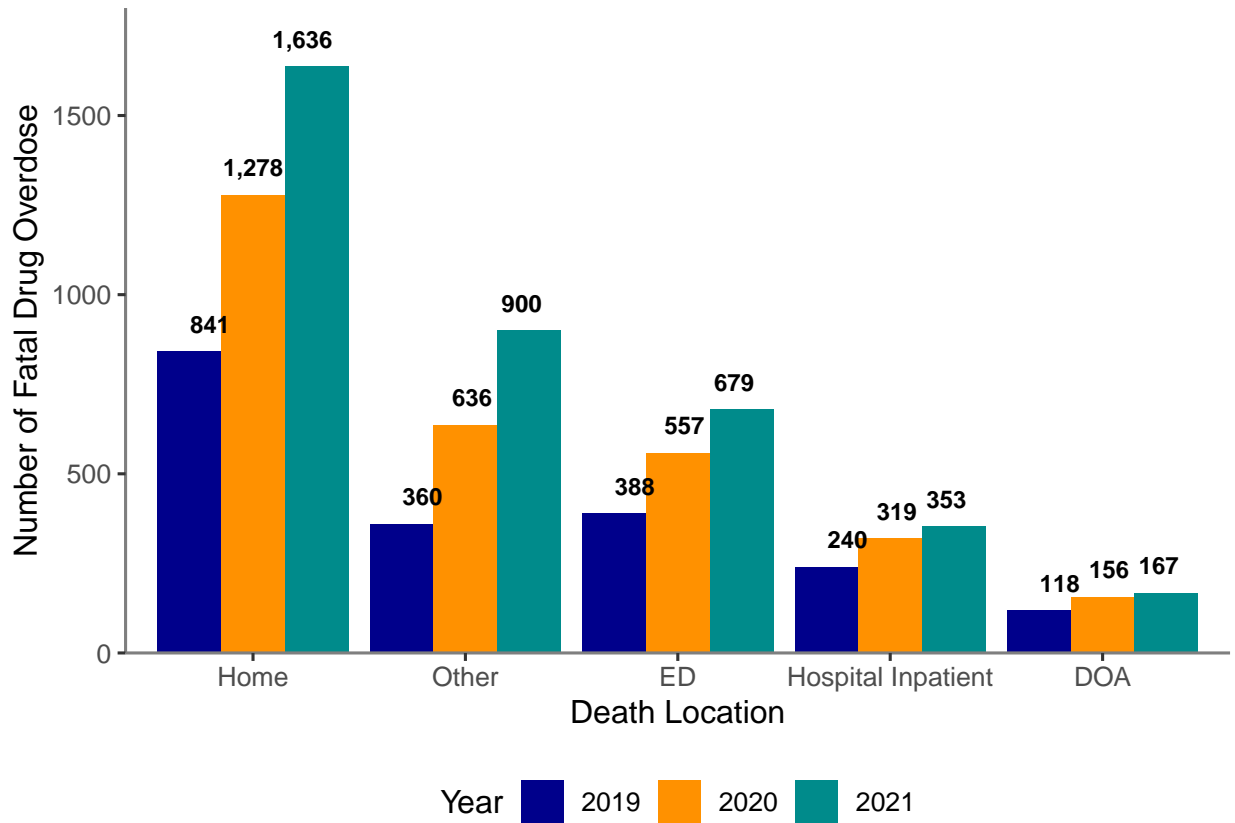
4.4 Percent of SUDORS Decedents Treated in the Emergency Department in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

Between 2019 and 2021, on average, only 34% of decedents in Tennessee were seen in an emergency department (ED) for their fatal overdose. This includes decedents taken to the emergency department by EMS or a private vehicle. Decedents that are taken to the emergency department but are dead on arrival (DOA), were also included in this percentage.

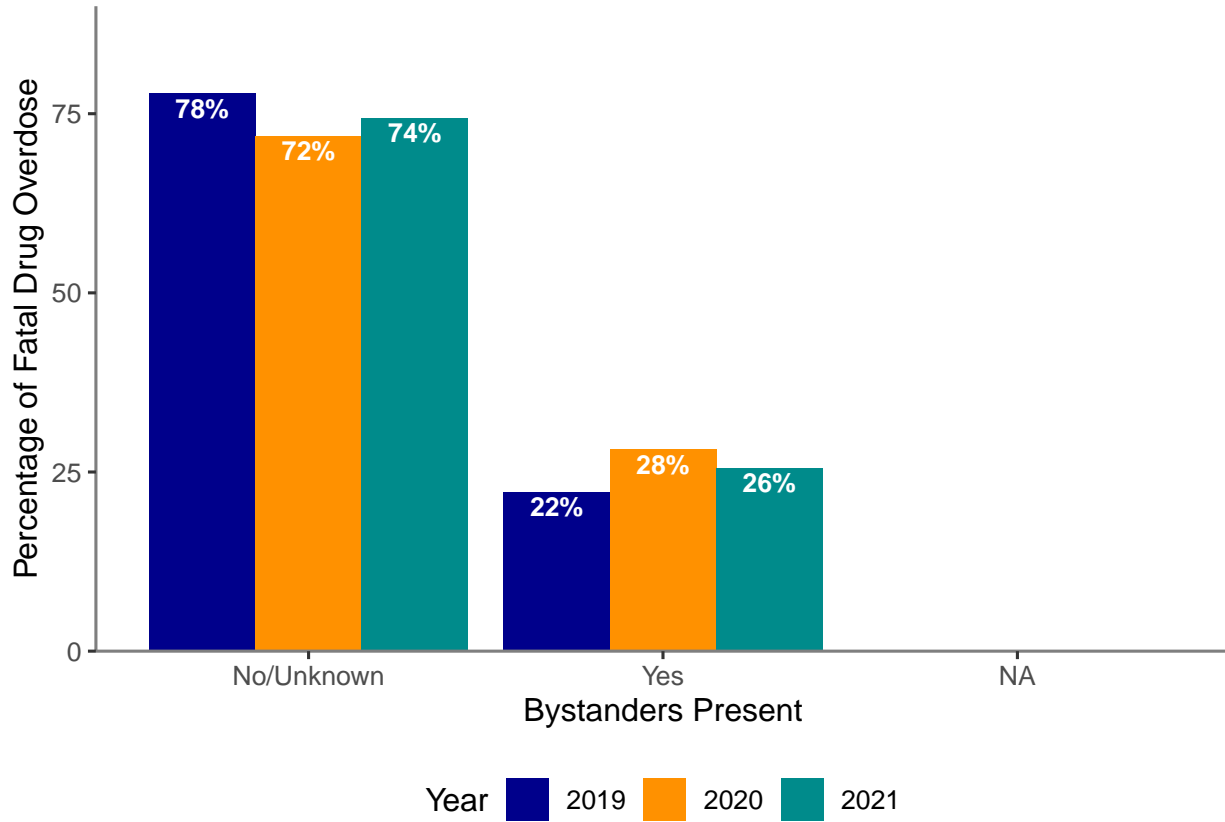
4.5 Death Location of SUDORS Decedents in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

Death location is defined as the place where the death was pronounced. Most fatal overdoses between 2019 and 2021 occurred at the decedent’s home. ‘Other’ location predominately refers to another residence.

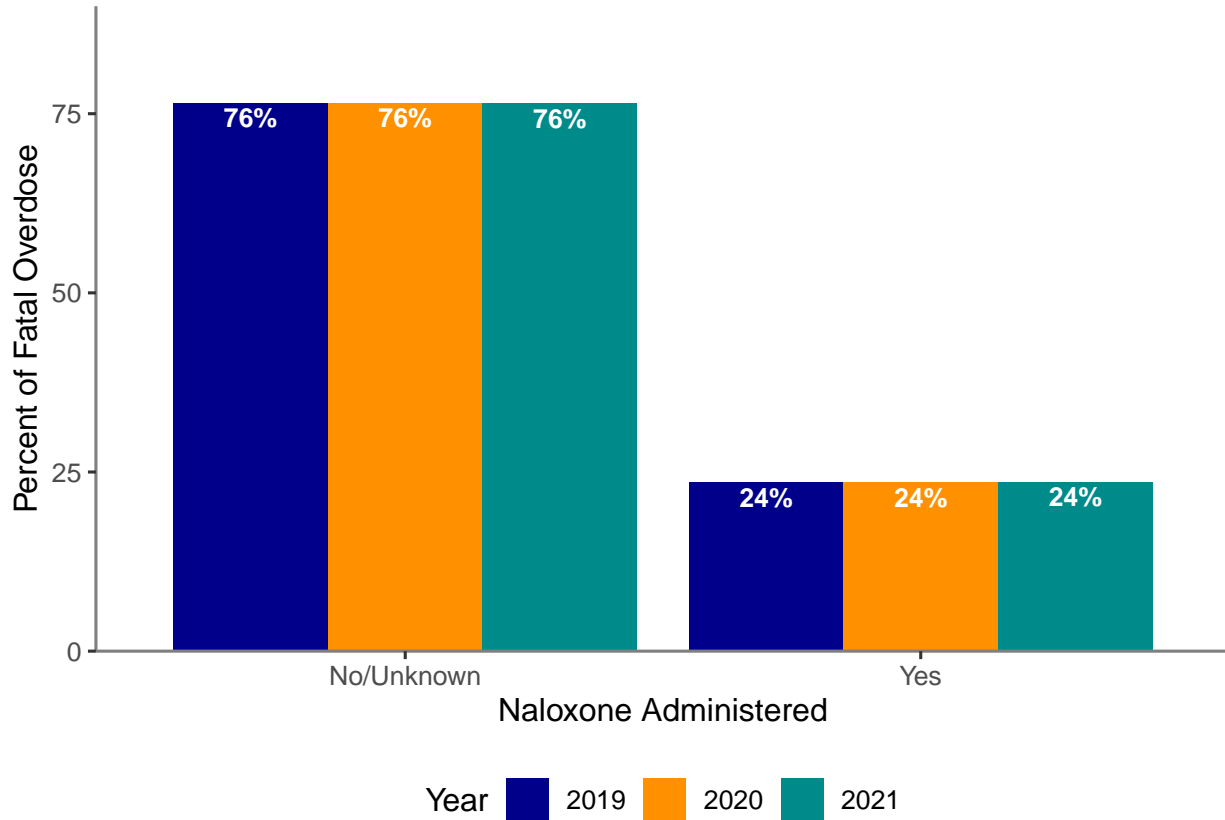
4.6 Bystander Presence at Time of Overdose for SUDORS Deaths in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

A bystander is a person who was in the same location and could have potentially intervened during an overdose. Between 2019 and 2021, on average, a bystander was confirmed to be present in only 23% of overdose deaths.

4.7 Percent of SUDORS Deaths with Evidence of Naloxone Administration in Tennessee



Analysis by the Office of Informatics and Analytics, TDH (last updated February 15, 2023). Data Source: TN SUDORS, 2019-2021

Naloxone is a life-saving medication that can reverse the effects of an opioid-involved overdose. In 2021, among SUDORS deaths in Tennessee, only 24% of decedents had evidence of naloxone administration. This evidence comes from witness reports, medical records, scene evidence, or toxicology results.

5 Conclusion

SUDORS is a powerful surveillance system that captures many details surrounding a decedent's fatal drug overdose. Between 2019 and 2021, 8,729 fatal drug overdoses in Tennessee met the SUDORS case definition. SUDORS deaths increased 87% from 2019 to 2021, indicating the drug overdose epidemic is not subsiding in Tennessee. The increase in the age-adjusted rate of overdose death in Black individuals as well as the growing number of overdose cases with fentanyl involvement are of particular concern.

Additionally, a bystander had the potential to intervene in 26% of overdose deaths in 2021, a decrease from 28% in 2020. On average, between 2019 and 2021, naloxone was administered in nearly 24% of deaths. With the increase in fentanyl involvement, naloxone training and distribution is critical to decrease fatal overdoses. Family, friends, and the general public should know how to administer naloxone to better help individuals during a drug overdose. Research on prevention and intervention strategies should continue focusing on minorities and culturally relevant treatment and prevention options. The SUDORS team plans to conduct future analyses to determine if treatment options are available near individuals who need it the most.

5.1 Additional Data Resources

The Office of Informatics and Analytics offers a variety of reports on its Facts & Figures page on the TDH website (<https://www.tn.gov/health/health-program-areas/pdo/pdo/facts-figures.html>)

If you are interested in data not available in this report or on our website, please submit a request through the TDH Data Request System (<https://www.surveygizmo.com/s3/5819792/TDH-Data-Request-Form>)

5.2 Resources for Treatment and Prevention

- Find Help Now is a national platform where individual can locate substance use disorder treatment options in their communities. This will soon be available to Tennesseans.
- The Tennessee REDLINE is the 24/7/365 resource for substance abuse treatment referrals. Anyone can call or text 800-889-9789 for confidential referrals.
- The Tennessee Statewide Crisis Line, available 24 hours a day/365 days a year, is a free resource for anyone experiencing a mental health crisis. All calls are routed to a trained crisis counselor in your area, who will provide you support and guidance, and work to connect you with the appropriate community supports. Call 855-CRISIS-1 (855-274-7471).
- For Tennesseans actively in recovery from substance use disorder or for people looking to get more information on preventing addiction, the Tennessee Department of Mental Health and Substance Abuse Services (TDMHSAS) offers the TN Recover App. This app is available for download in the Apple Store, the Google Play store, or by texting 'SAVE' to 30678.
- For naloxone training, the Regional Overdose Prevention Specialists (ROPS) are located throughout the state as a point of contact for overdose prevention and education. To learn more about the ROPS work or to contact your local ROPS, see <https://www.tn.gov/behavioral-health/substance-abuse-services/prevention/rops.html>
- In counties and communities across Tennessee, substance abuse prevention coalitions are working to reduce dependence on harmful and potentially lethal substances such as prescription drugs, alcohol, and tobacco. These local efforts, funded by the State of Tennessee since 2008, help spread the word about the dangers and consequences of substance use. To connect with a coalition in your community, see <https://www.tn.gov/behavioral-health/substance-abuse-services/prevention/anti-drug-coalition.html>.

- Fentanyl and fentanyl-involved overdoses are of growing concern across the state of Tennessee. While fentanyl is dangerous, overdoses involving fentanyl are preventable with the right knowledge and tools. To learn about fentanyl, TDMHSAS has created fentanyl specific resources and trainings are available for all Tennesseans. Find these at <https://www.tn.gov/behavioral-health/substance-abuse-services/prevention/fentanyl.html>.
- TN Together is a system designed specifically to engage and empower Tennessean to combat addiction in their community. It is an interactive, online resource hub with a 3-part goal: to provide examples of prevention activities, to showcase how other communities have been successful in prevention, and to access up-to-date addiction and recovery resources. To access this online hub: <https://tntogether.com/>.