

Vital Statistics Death Certificate Data for Drug Overdose Surveillance

The Tennessee Department of Health (TDH) monitors fatal drug overdoses using Tennessee death certificate data. This document explains the methods, definitions, and data sources used to identify and track overdose deaths in Tennessee.

It is intended to help users understand and interpret the data consistently. The document describes the death certificate system, explains how overdose deaths and the substances involved are identified, defines the indicators used by the surveillance program, and outlines the strengths, limitations, and timeliness of the data. It also describes the available demographic variables and provides information on accessing public overdose data products or requesting additional data.

The methods and definitions in this document are used across TDH's fatal drug overdose surveillance activities and support multiple public data products, including reports, downloadable datasets, and the Tennessee Drug Overdose Dashboard.

Section Guide

- [About Vital Statistics Death Certificate Data](#)
- [Drug Overdose Death Indicators](#)
- [Demographic Information Available in Death Certificates](#)
- [Public Data Products with Fatal Data](#)
- [Requesting Additional Data](#)

About Vital Statistics Death Certificate Data

The TDH Overdose Surveillance Program uses death certificate data to identify and track fatal drug overdoses in Tennessee. This section provides more information about death certificates and how it is used for fatal overdose surveillance.

About Tennessee Death Certificate Data

The Tennessee Department of Health (TDH) Division of Vital Records and Statistics collects and maintains death records for Tennessee residents. Death certificates are submitted electronically by funeral homes, physicians, and medical examiners through the Vital Records Information Management System (VRISM). If a Tennessee resident dies in another state or jurisdiction, that death record is shared with Tennessee through an agreement among U.S. vital records offices. The cause of death is determined and certified by the physician or medical examiner. Tennessee's mortality statistics include all deaths of Tennessee residents, regardless of where the death occurred, so they can be accurately compared with the state's resident population.

Timeliness of Death Certificate Data

Finalizing death certificate data takes time because information must be collected, reviewed, and coded before the record is complete. As a result, finalized death certificate data are typically available about 15 months after the end of the calendar year. For example, deaths that occur in 2025 are expected to be finalized in March 2027.

Preliminary death certificate data are available much sooner and can be used to monitor overdose trends with less delay. These data are typically available 6 months after a death occurs. Although preliminary data may change as death certificates are finalized, they provide valuable early information for surveillance and trend monitoring.

Identifying Drug Overdose Deaths in Death Certificate Data

On a death certificate, physicians or medical examiners record the sequence of medical conditions that led to a person's death, as well as other health conditions that may have contributed but were not the direct cause of death. These descriptions are converted into standardized ICD-10 codes using national coding rules developed by the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC). One ICD-10 code is assigned to identify the underlying cause of death, and additional ICD-10 codes are assigned to capture all other conditions listed on the death certificate. Using standardized codes allows causes of death to be analyzed and compared consistently across Tennessee and the United States.

For more information about how causes of death are coded, visit the National Vital Statistics System website: https://www.cdc.gov/nchs/nvss/mortality_methods.htm#methods

Considerations When Interpreting Death Certificate Data

Death certificate data is an important source of information for fatal drug overdoses in Tennessee, but there are limitations to consider when interpreting these data.

Identification of specific drugs. ICD-10 codes do not identify every individual drug or substance. Some codes represent broad drug classes rather than specific substances. As a result, certain overdose indicators may require toxicology results or searches of the cause-of-death text. For example, xylazine does not have a unique ICD-10 poisoning code and may be included in a broader category, such as sedatives, opioids, or unspecified drugs. TDH may also search the cause-of-death text for specific drug names to identify substances that do not have a unique ICD-10 code.

Identification of substances involved in an overdose. Toxicology information is not available for every death, and the results reported to TDH may not include all tests performed. In addition, toxicology panels vary and may not detect newer or specialized substances, such as designer opioids or benzodiazepines. In some cases, forensic centers may order expanded testing to identify these substances. As a result, data on newer or designer drugs may be inconsistent across the state and may underestimate the number of deaths involving these substances.

Preliminary versus finalized data. Preliminary death certificate data provide more timely information about recent and emerging overdose trends. However, these records may be updated as additional information becomes available, and counts may change over time. Preliminary data are best used to monitor potential changes in overdose activity. Finalized death certificate data are more appropriate for reporting long-term trends, conducting research, and supporting program planning.

Tennessee Drug Overdose Death Definitions

Drug overdose deaths are identified using the ICD-10 codes and text search methods described in the indicator section below. First, deaths are restricted to only include Tennessee residents. Death certificate data includes all manners of death which are reported as natural, accidental, homicide, suicide, and undetermined.

Drug Overdose Death Indicators

Primary Criteria:

- Only Tennessee residents

Indicators exclude the following:

- Death related to chronic use of drugs (e.g., damage to organs from long-term drug use)
- Deaths that occur under the influence of drugs, but do not involve acute poisoning (e.g., a car crash that occurred because the driver was under the influence of a particular drug)

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

Identifying Drugs Involved in Overdose Deaths

After identifying deaths with an overdose as the underlying cause, the multiple cause-of-death fields are examined for ICD-10 codes and cause-of-death text to identify the drug or drugs involved. Common drug categories are listed below. Because not all substances have a corresponding ICD-10 code, the Tennessee Department of Health also uses cause-of-death text to identify certain drugs. Drug involvement identified from death certificate data is limited to substances determined to have contributed to the death, rather than every substance detected during toxicology testing. For example, substances such as caffeine or nicotine may be identified during toxicology testing but are not typically listed as contributing causes of death. Similarly, some substances may be detected only in very small concentrations or determined not to have contributed to the death based on the medical examiner's findings and therefore are not included on the death certificate as causes of death.

Drug Overdose Deaths Involving All 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
 - Contain the following text in the contributing cause of death text fields: 'FENTAN', 'FENTA', 'FANTAN' and some other misspellings when no opioid code is available

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' and some other misspellings'

Drug Overdose Deaths Involving Prescription Opioids for Pain

- 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 Benzodiazepines

- Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code as a contributing cause of death:
 - **T42.4:** Poisoning by benzodiazepine

Drug Overdose Deaths Involving All Opioids and Benzodiazepine

- Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code 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
- **AND** Contains the following as a contributing cause of death:
 - **T42.4:** Poisoning by benzodiazepine

Drug Overdose Deaths Involving All Stimulants

- 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

Drug Overdose Deaths Involving Cocaine

- Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code as a contributing cause of death:
 - **T40.5:** Poisoning by cocaine

Drug Overdose Deaths Involving Psychostimulants (Primarily Methamphetamine)

- 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

Drug Overdose Deaths Involving Opioids and Any Stimulant

- 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)
 - **AND** Contains the following as a contributing cause of death:
 - **T43.6:** Poisoning by psychostimulant with abuse potential
 - **T40.5:** Poisoning by cocaine

Drug Overdose Deaths Involving Antidepressants

- Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code as a contributing cause of death:
 - **T43.2:** Poisoning by antidepressant

Drug Overdose Deaths Drug Overdose Deaths Involving Xylazine

- Must meet criteria for All Drug Overdose deaths AND contain the following ICD-10 code as a contributing cause of death text fields: Xylazine

Drug Overdose Deaths Involving Medetomidine

- Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: Medetomidine

Drug Overdose Deaths Involving Nitazenes

- Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: Nitazene

Drug Overdose Deaths Involving Orphines

- Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: cychlorphine, chlorphine, brorphine, n-propionitrile, etodezitramide

Drug Overdose Deaths Involving Kratom

- Must meet criteria for All Drug Overdose deaths AND contain the following text in the contributing cause of death text fields: Kratom, mitragynine

Demographic Information Available in Death Certificates

Tennessee death certificates include demographic information about the decedent, including age, race, and sex. These variables are used to describe patterns in drug overdose deaths and identify differences in overdose mortality across population groups. Categories are grouped to improve interpretability, ensure sufficient counts for reporting, and maintain consistency with public health surveillance practices.

Age

Age is calculated according to date of birth and date of death. Drug overdose deaths have been grouped into standard age categories for reporting purposes including: < 18 years, 18-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65+ years.

Note: Age-adjustment is used for all fatal overdose rates except for those stratified by age. Age-adjusted rates were calculated using 2000 US standard population. The rate for a specific age group in a given population was multiplied by the proportion of people in the same age group in the 2000 U.S. standard population; adding across age groups yields the final age-adjusted rate.

Race

Race information is collected from the death certificate and is reported based on the information provided by the certifier. Due to small numbers, the 'Another Race' category combines individuals reported as American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, multiple races, or another race.

Update on Fatal Race Demographics

In 2022, the National Center for Health Statistics (NCHS) discontinued its bridged race fields which allowed TDH to calculate single race statistics for Tennesseans who died each year of an overdose. With this, OIA has updated how race is calculated and applied to all previous years' data. To assign a single race for each decedent, OIA will use the following logic for all data products developed in 2024 and those moving forward:

- **White Race** is assigned for all decedents where only white race was indicated
- **Black Race** is assigned for all decedents where only black race was indicated
- **Another Race** is assigned for all decedents where any other race was indicated OR where multiple races were indicated
- Races without any assigned race codes will be considered unknown/not reported, and not included in the dashboard or accompanying downloadable data set

Sex

Sex is reported based on information recorded on the death certificate. For surveillance purposes, sex is reported as male or female.

Ethnicity

Ethnicity is reported based on information recorded on the death certificate. For surveillance purposes, ethnicity is reported as Hispanic or Non-Hispanic.

Public Data Products with Fatal Data

Fatal drug overdose information from Tennessee death certificate data is available through several public-facing resources maintained by Overdose Surveillance Program. These resources provide access to overdose trends, indicator-specific data, reports, and downloadable datasets. Available years of data and level of detail vary by resource. The two places you can find all data products are:

Overdose Surveillance Website: <https://www.tn.gov/health/odsurveillance.html>

TN Data Portal: <https://healthdata.tn.gov/>

Drug Overdose Data Dashboard

- Tennessee's Overdose Data Dashboard provides interactive visualizations of fatal drug overdose data using finalized death certificate data. The dashboard displays the most recent five years of available data and allows users to explore fatal overdose trends by selected indicators, demographics, and geographic characteristics.
 - *The Data Dashboard can be found at the OIA Webpage listed above. This dashboard is best viewed on a computer screen; however, a mobile version is also available.*
 - *Demographic data included in the dashboard are available at the statewide and public health region level.*
 - ***Drug Overdose Deaths Involving Antidepressants*** is not an indicator included in the dashboard.
 - ***Drug overdose deaths by ethnicity*** is not included in the dashboard.

Downloadable Data Sheets

- Downloadable data files are available for users who need access to the data displayed within the Tennessee Overdose Data Dashboard. These files include the dashboard data as well as additional historical years of data dating back to 2013. The same indicator definitions and methods used for TDH's fatal overdose surveillance are applied to the downloadable data.

Annual Reports

- The annual Tennessee Drug Overdose Death Reports provide comprehensive summaries of finalized fatal drug overdose data, including statewide trends, demographic characteristics, geographic patterns, and substances involved. This report is published each year after the data are finalized. Archived reports and related products are available on the overdose surveillance website dating back to 2015.

Preliminary Drug Overdose Data, Reports and Briefs

- Preliminary drug overdose data are available through the Tennessee Drug Overdose Dashboard, the Preliminary Drug Overdose Report, and Public Health Region data slides.

- Preliminary data are released with a six-month reporting lag and updated monthly as additional death records become available. This allows earlier months to become more complete overtime.

Requesting Additional Data

The Overdose Surveillance Program makes overdose data publicly available whenever possible through reports, dashboards, and downloadable data files. However, some data cannot be released because they are not yet complete or because the level of details could identify individuals or compromise privacy.

If the information you need is not available through existing public data products, you may submit a request for additional aggregate overdose data.

Data request form: <https://tdhrc.health.tn.gov/redcap/surveys/?s=DHMKP9HDD4FAT43K>

Examples of data that may be available include:

- Aggregate counts of drug overdose deaths by county of residence or public health region
- Aggregate counts of drug overdose deaths by geographic area and demographic characteristics (such as age, sex, or race/ethnicity), when disclosure rules allow.
- Other summary statistics that do not identify individuals.

To protect privacy, small counts may be suppressed or combine, particularly for counties with small populations or less common demographic groups.

Because data requests may take time to review and fulfill, we recommend contacting the Overdose Surveillance Program (TDH.Analytics@tn.gov) before submitting a formal request. We can help determine whether the data are already publicly available, discuss whether your request can be fulfilled, and identify the most appropriate data source for your needs.

Additional Questions

Feel free to reach out to OIA directly for any questions at tdh.analytics@tn.gov