Drug Overdose Surveillance and Epidemiology (DOSE) System

The United States (US) overdose epidemic affects people of every age, sex, race, ethnicity, and geographic location. Monitoring trends in emergency department (ED) visits and inpatient hospitalizations for nonfatal overdoses provides timely data to inform drug overdose response and prevention activities.

CDC's Drug Overdose Surveillance and Epidemiology (DOSE) System

In 2016, CDC's DOSE System began as part of the Enhanced State Opioid Overdose Surveillance (ESOOS) program. As of 2025, DOSE captures data from two surveillance systems representing 49 states and the District of Columbia as part of the Overdose Data to Action in States (OD2A-S) program.

1. Electronic health record (EHR) data are collected monthly, with a one- to two-month lag, from syndromic surveillance systems to rapidly identify anomalies and provide situational awareness of changes in suspected nonfatal drug overdose-related ED visit trends.
   - Among 47 participating states and the District of Columbia (Figure), on average, more than 90% of ED facilities in participating states are covered in DOSE syndromic surveillance data.
   - DOSE syndromic surveillance data are updated on the DOSE Syndromic Dashboard each month.
2. ED and inpatient hospitalization discharge surveillance data are collected annually, with a six-month lag from end-of-year closeout to submission, for a more complete and accurate understanding of overdose burden in EDs and among inpatient hospitalizations.
   - With robust coverage across 35 participating jurisdictions, averaging over 95% of ED and hospital facilities, this data stands out as one of the most valuable resources for understanding state and national trends.
   - DOSE ED and inpatient hospitalization discharge surveillance data are updated on the DOSE Discharge Dashboard annually.

Data collected through DOSE syndromic surveillance are used for rapid identification of nonfatal overdoses

Timely reporting and analysis of syndromic surveillance EHR data from EDs is used to identify, track, and respond to changes in drug overdose trends more quickly.

Rapid availability of data helps to promote response readiness for overdose increases at the state or national level and improves coordination among:

- Health departments
- Healthcare providers
- Law enforcement
- Communities
- Public health
- Government agencies

Data from the DOSE System are used for action

Provides timely data on nonfatal overdoses treated in emergency departments

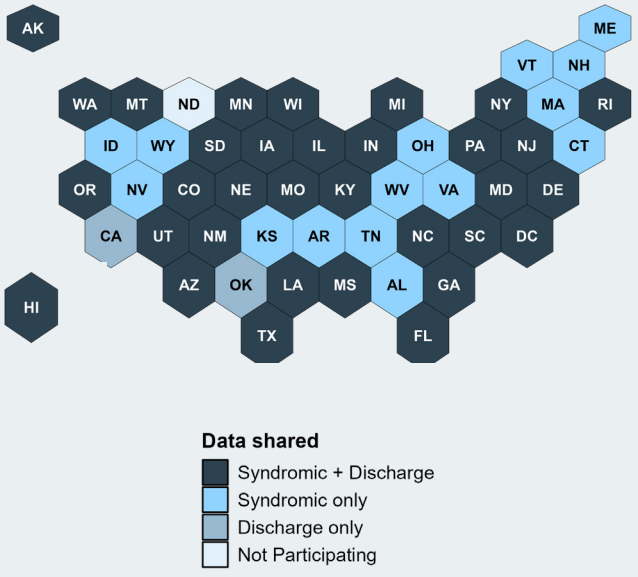
Identifies overdose anomalies or outbreaks and changes in trends

Gives additional insight into nonfatal overdoses with inpatient hospitalization data

Informs drug overdose response and prevention activities

The drug overdose epidemic continues to impact our communities.

Figure. Jurisdictions Participating in DOSE



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The DOSE System includes two complementary data sources that are collected and analyzed separately. A comparison of these data sources is provided in the table below.

	Syndromic Surveillance Data	Discharge Data
Data source description	Preliminary information from ED visits before a diagnosis is confirmed	Finalized discharge data used to identify the reason for ED visit/hospital admission for billing purposes
Timeliness	Faster (one-month delay)	Slower (six-month lag from end-of-year closeout to submission)
Data completeness	Less complete due to reliance on preliminary data from a limited number of hospitals, which may not accurately reflect the full scope of overdoses	More complete, based on finalized discharge diagnosis codes from both ED and inpatient hospitalization visits
Data best used for	Rapid assessment of trends and identification of overdose spikes and emerging issues	Estimating long-term trends and burden
Data shared with CDC	Separated into (1) age group, sex, race and ethnicity, and (2) county of patient residence	Separated into (1) age group, sex, race and ethnicity, and (2) county of patient residence. Participating jurisdictions also share line-level data on visits involving any T36–T50 ICD-10-CM code, including all intents, encounter types, drugs, underdosing, and adverse effects.
Definitions	DOSE syndrome definitions are designed to be used to identify ED visits for suspected nonfatal drug overdoses of unintentional or undetermined intent. The query relies on data in two fields from ED visit records to identify encounters that meet one or more of the definitions: **Discharge Diagnosis Field** The discharge diagnosis field, which includes ICD-9-CM, ICD-10-CM, and/or SNOMED-CT diagnosis codes, with descriptive text removed, and which may indicate an acute drug overdose or poisoning of unintentional or undetermined intent. **Chief Complaint Field** The chief complaint free text field, which is a processed version of the reported chief complaint and may include terms indicating a drug overdose or poisoning, as well as relevant exclusion terms (e.g., terms indicating withdrawal without acute intoxication, which would exclude ED visit records from this syndrome definition).	Utilizes ICD-10-CM coding schemes to query key fields that describe the reason for ED visit/ hospital admission **Visits that meet the following criteria are classified per DOSE discharge case definitions:** **Final Discharge Diagnosis Field** Search all diagnosis codes for line-level data on visits with an ICD-10-CM code between T36–T50, including all intents, encounter types, drugs, underdosing, and adverse effects. For the DOSE Discharge Dashboard, nonfatal drug overdoses of unintentional/undetermined intent are classified according to DOSE discharge case definitions.
Data captured by DOSE	Syndromic: ED visits for suspected nonfatal overdoses of unintentional/undetermined intent involving all drugs, all opioids, heroin, fentanyl, benzodiazepines, all stimulants, cocaine, and methamphetamine. Discharge: ED visits and inpatient hospitalizations for nonfatal overdoses of unintentional/undetermined intent involving all drugs, all opioids, heroin, fentanyl, benzodiazepines, all stimulants, cocaine, and methamphetamine, as well as line-level data on all visits associated with T36-T50 ICD-10-CM codes, covering all intents, encounter types, drugs, underdosing, and adverse effects.	

For more detailed information on data sources, definitions, and specific categories, please visit our websites!

DOSE Dashboard: Nonfatal Overdose Syndromic Surveillance Data

DOSE Dashboard: Nonfatal Overdose Emergency Department and Inpatient Hospitalization Discharge Data