

# 2021 Virtual COSSAP National Forum

COSSAP 2021: New Partners, New Tools, Renewed Hope

November 16–18, 2021

# Leveraging Multiple Data Systems to Design and Implement a Drug Overdose Surveillance System in Middle Tennessee

**Haley Hershey, MPH**

Epidemiologist

**Josh Love, MPH**

Epidemiologist

This event was supported by Grant No. 2017-AR-BX-K003 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the U.S. Department of Justice's Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking (SMART). Points of view or opinions in this presentation are those of the author(s) and do not necessarily represent the official position or policies of the U.S. Department of Justice.

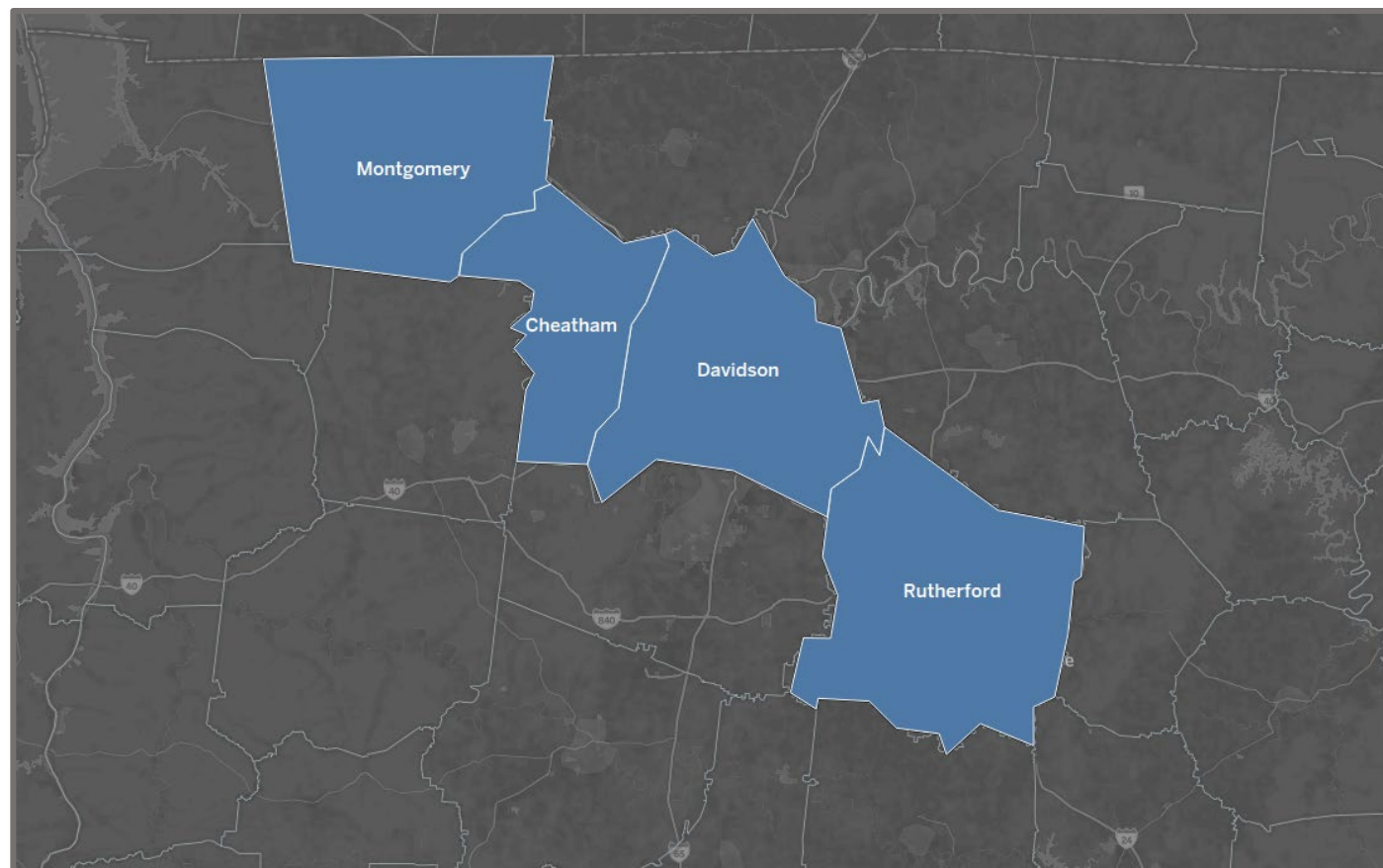
# Learning Objectives

After this session, participants will have an increased awareness of:

- How ODMAP is utilized for overdose response efforts in two geographic areas (Northeast and mid-South).
- Methodology associated with developing an overdose surveillance system including possible data streams and acute overdose activity detection channels.
- How an overdose surveillance system can be leveraged in order to implement data-to-action strategies with public health, public safety, and prevention partners.
- How an overdose surveillance system can be utilized as a core component of acute overdose response planning.

# Overview

- Background
- Design of surveillance systems in Davidson County and middle TN
- Implementation and output of surveillance system
  - Acute overdose response plan
  - Spike alert examples
  - Cluster analyses
  - Community initiatives
- Evaluation of surveillance and response activities
- Future activities



# Background

- Similar to national and state trends, the drug overdose epidemic has been increasing unabatedly for several years in middle Tennessee.
- Declared Public Health Emergency by President Trump in October 2017, renewed in 2021 by President Biden's administration
- Enhanced monitoring and analysis across multiple data systems is crucial in order to monitor, detect, and respond to emerging activity.
- In 2019, a drug overdose surveillance system was developed and operationalized to address this gap.



# Public Health Surveillance

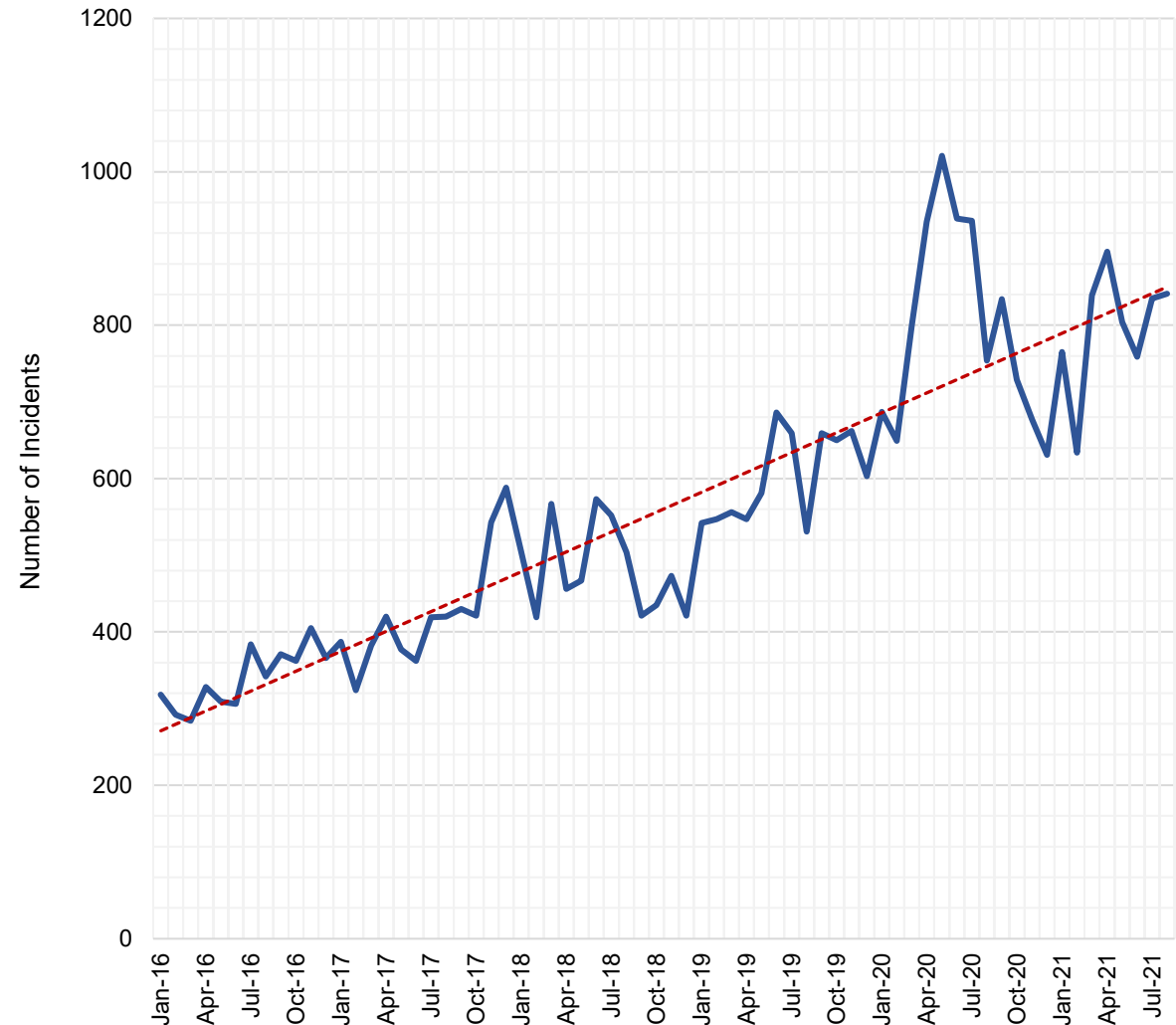
## What is it?

- Ongoing **collection**, **analysis**, and **interpretation** of health data
- Allows for the timely **dissemination** of information
- Utilized for investigation, control, and prevention

## Objectives of an Effective Surveillance System

- Estimate magnitude of a disease
- Understand the history of a disease
- **Detect outbreaks**
- Distribution and spread of a disease
- Evaluate prevention/control strategies for mitigation
- Monitor changes in trends

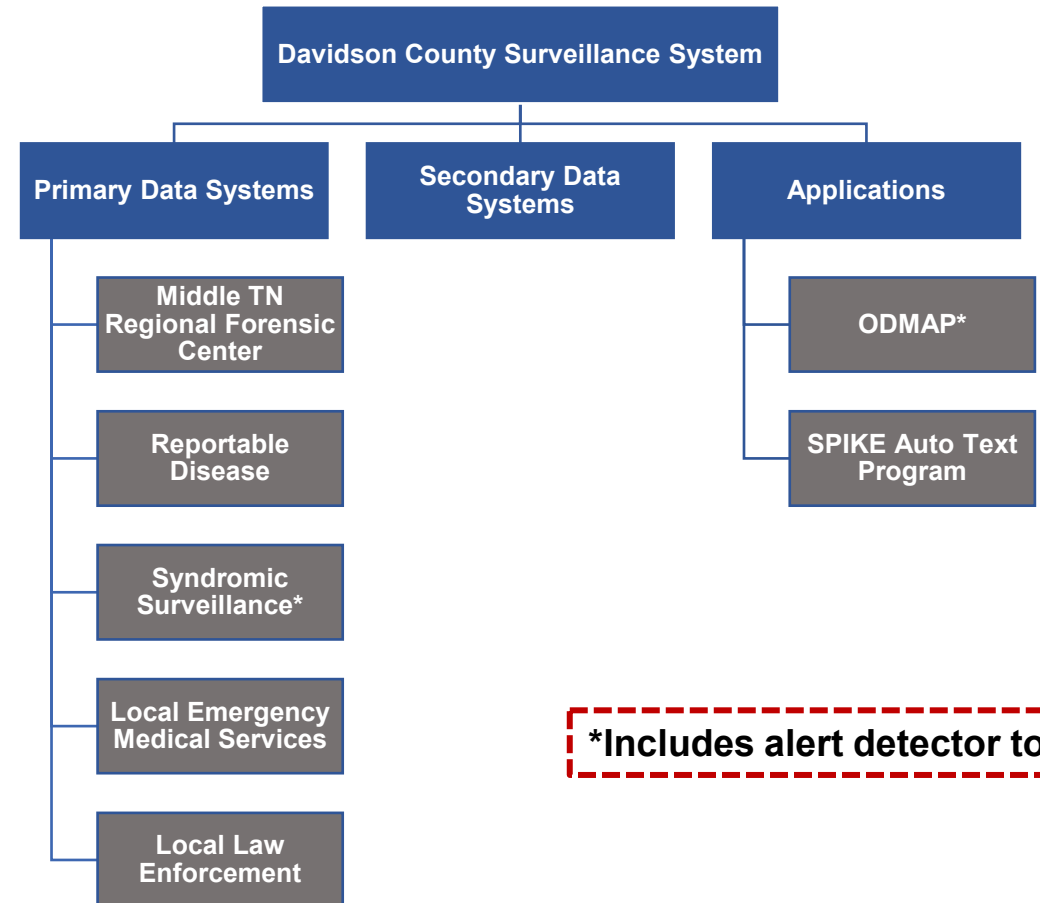
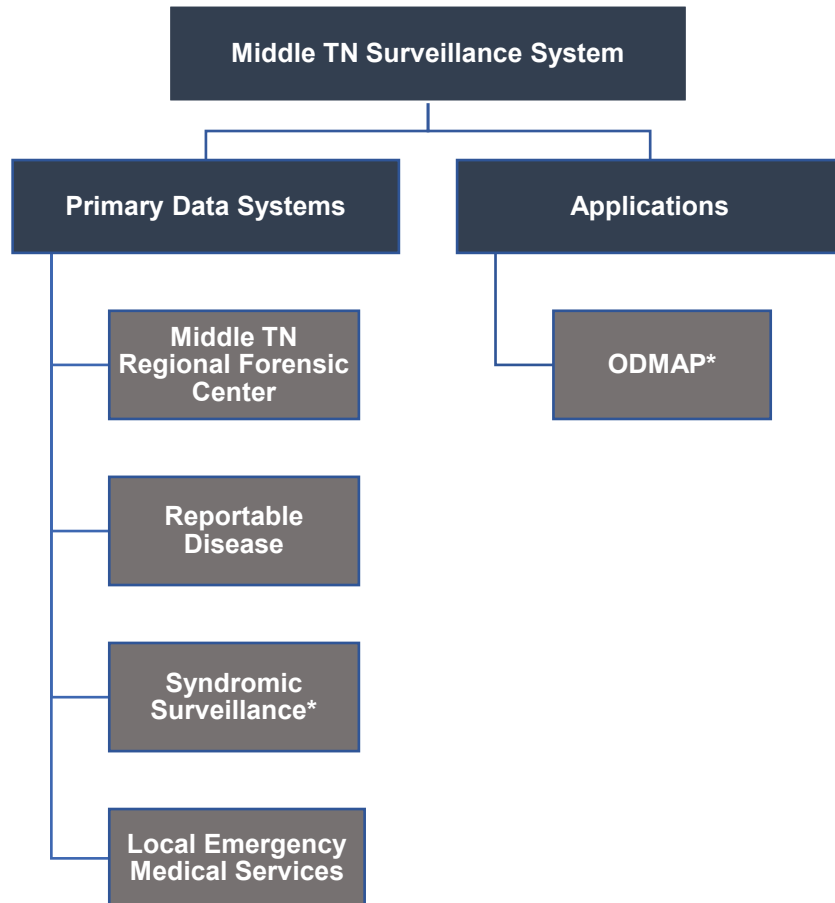
Fatal and Nonfatal Overdose Activity, January 2016-August 2021, Davidson County, TN



Sources: NFD-EMS, ESSENCE-TN, MNPD Incidents, Death Investigation and Decedent Information Database, accessed October 22, 2021

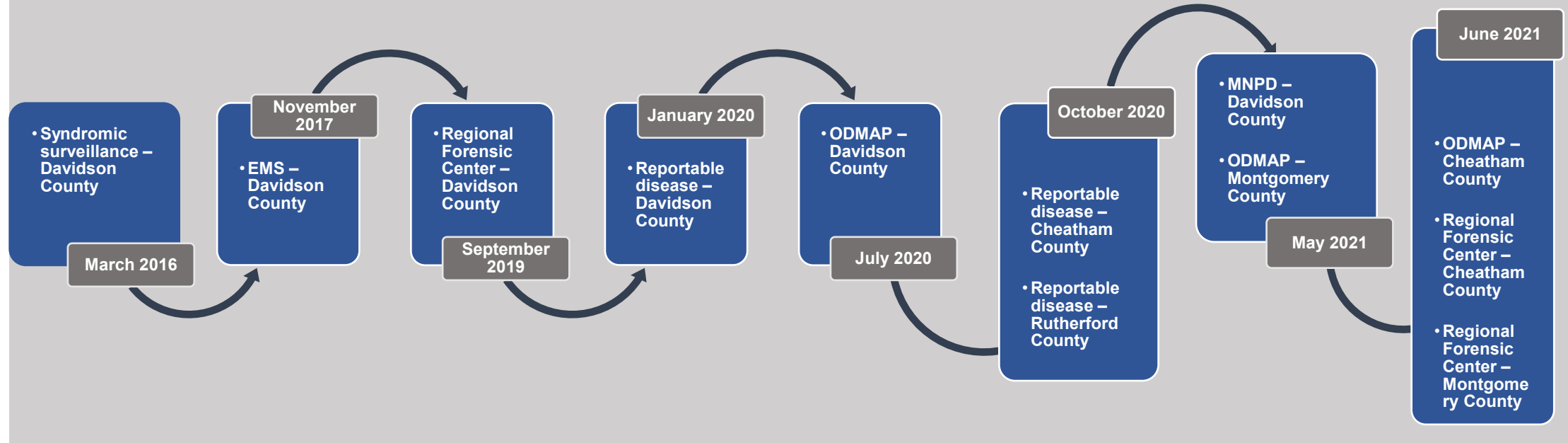
# Identify and Integrate Data Systems

- Integrated data systems include public health, public safety, forensic science, and hospital/EDs
- Primary data systems are utilized daily and provide information during acute response situations
- Secondary data systems provide further context and are utilized on an intermittent/ad hoc basis



**\*Includes alert detector tool**

# Timeline



	Cheatham	Davidson	Montgomery	Rutherford
Middle TN Regional Forensic Center	X	X	X	
Reportable Disease	X	X		X
Syndromic Surveillance	X	X	X	X
Local EMS/ODMAP	X	X	X	



# Primary Data Systems – Nonfatal Drug Overdoses

## I. Nashville Fire Department EMS

- **Description:**
  - Local suspected drug overdoses requiring EMS response
- **Notable Variables:**
  - Incident date/time
  - Patient demographics and address
  - Naloxone administration
  - Incident narrative
  - Patient disposition/destination

## II. Metro Nashville Police Department (MNP) Incidents

- **Description:**
  - Accidental overdoses in Davidson County reported by local law enforcement
  - Drug/equipment violations
- **Notable Variables:**
  - Incident date/time
  - Offense code
  - Demographics
  - ZIP Code

# Primary Data Systems – Nonfatal Drug Overdoses

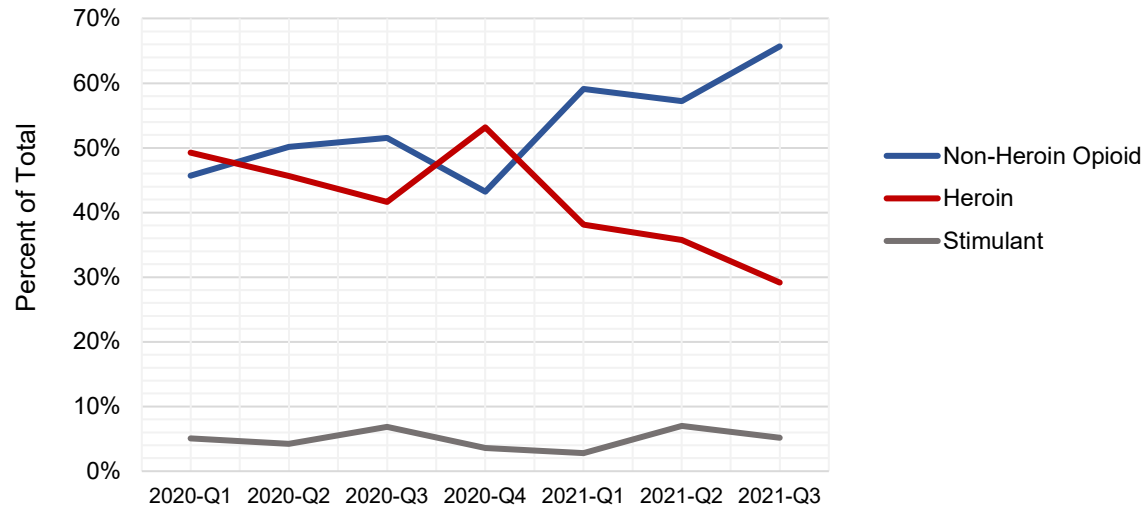
## III. Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE)

- **Description:**
  - National syndromic surveillance system
  - Suspected nonfatal overdose-related ED visits
- **Notable Variables:**
  - Incident date/time, chief complaint, discharge diagnosis, reporting hospital, patient demographics and ZIP Code
- **Consistent Definitions:**
  - Utilize standardized CDC queries to capture ED visits involving opioids and stimulants

## IV. Tennessee Department of Health Drug Overdose Reporting (TDH-DOR) Project

- **Description:**
  - Statewide reportable disease system (drug overdose was added in Tennessee in 2016)
  - Nonfatal drug overdoses reported by hospitals
- **Notable Variables:**
  - Admission/discharge date, reporting hospital, drug/substance category, patient demographics, and address
- **Drug Categories:**
  - Benzodiazepines
  - Muscle relaxants
  - Opioids
  - Stimulants

Percent of Total Overdose-related ED Visits by Drug Class  
January 2020-September 2021 – Davidson County, TN



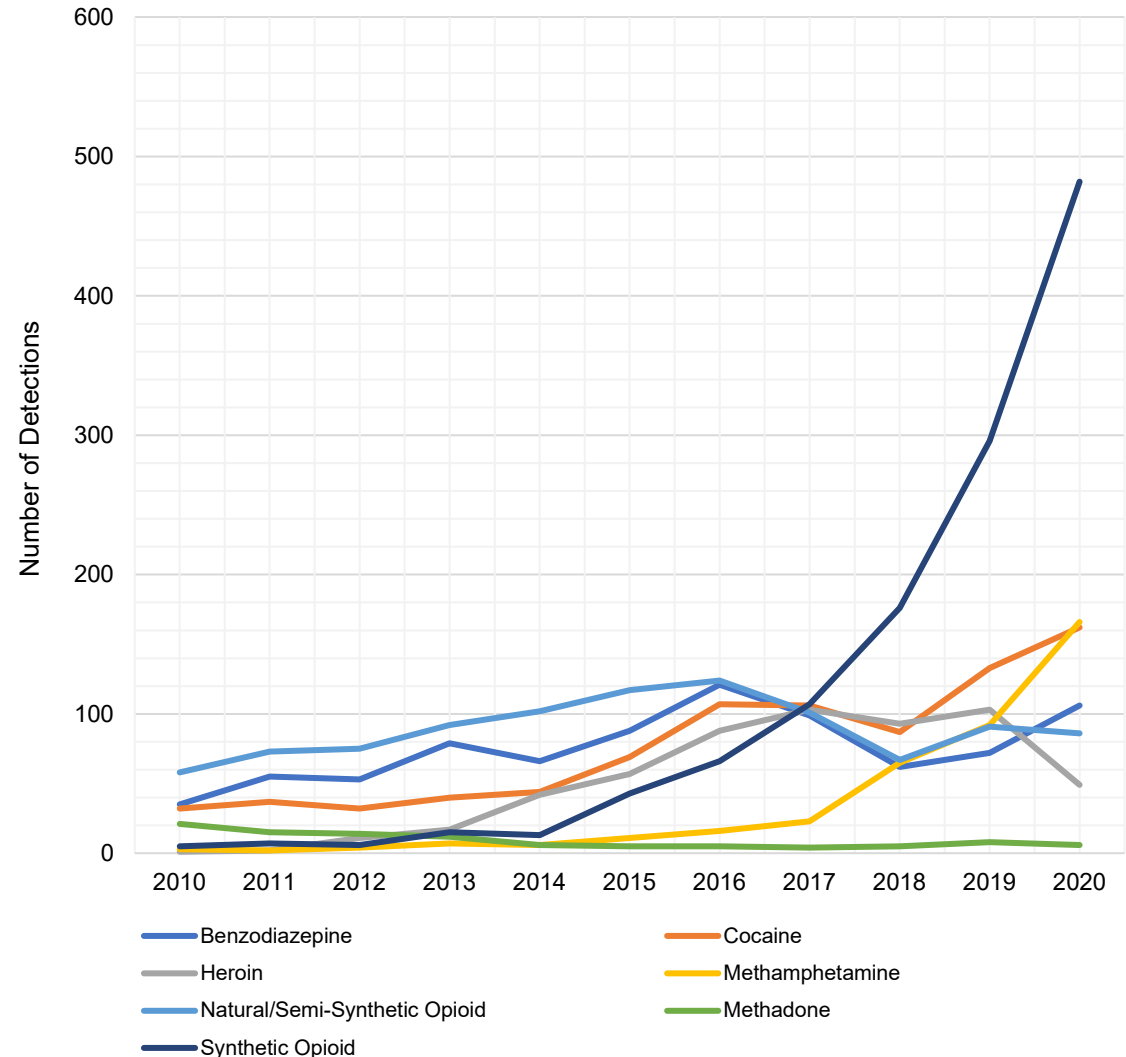
Source: ESSENCE-TN, accessed October 25, 2021.

# Primary Data Systems – Fatal Drug Overdoses

## V. Middle TN Regional Forensic Center Database

- **Description:**
  - Suspected fatal drug overdoses occurring in the county
- **Notable Variables:**
  - Incident date
  - Patient demographics/address
  - Injury/death location
  - Toxicology report including substances detected
  - Incident narrative
  - Scene details
- **Substance Categories:**
  - Natural/Semi-synthetic opioids
  - Synthetic opioids (i.e., fentanyl, fentanyl analogs, and tramadol)
  - Methadone
  - Cocaine
  - Methamphetamine
  - Benzodiazepine

Substances Detected among Suspected Overdose Deaths, 2010-2020  
Davidson County, TN



Source: Death Investigation and Decedent Information Database, accessed October 22, 2021.

# Secondary Data Systems

## Public Health

Metro Public Health Department Clinic EHR System

TDH Hospital Discharge Data System

TDH Vital Statistics

TDH Controlled Substances Monitoring Database (CSMD)

## Public Safety

TN Incident Based Reporting System (TIBRS)

Davidson County Sheriff's Office

## Forensic Science

Center for Forensic Science Research and Education (CSFRE)

## Treatment Recovery

Local behavioral healthcare partner

## Prevention

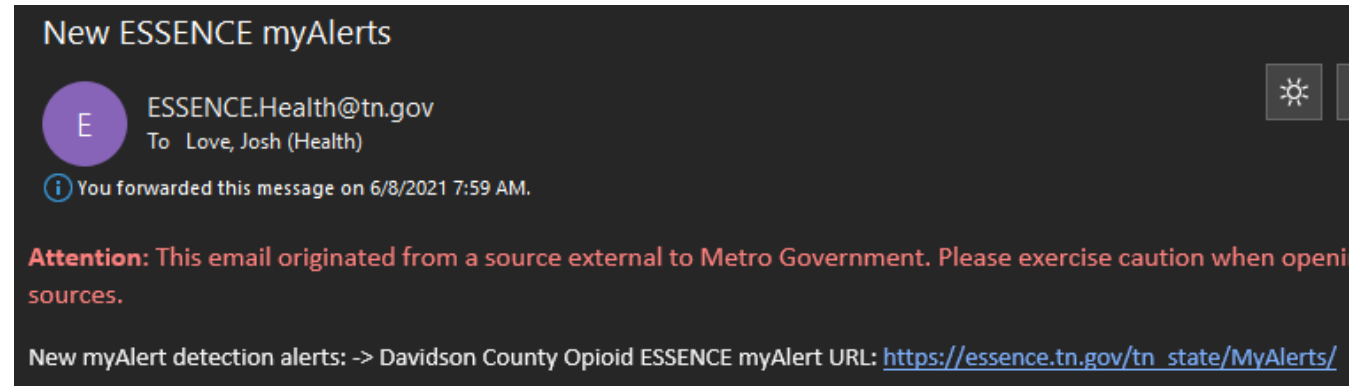
Syringe Services Program (SSP)

# Overdose Activity Alert Detectors

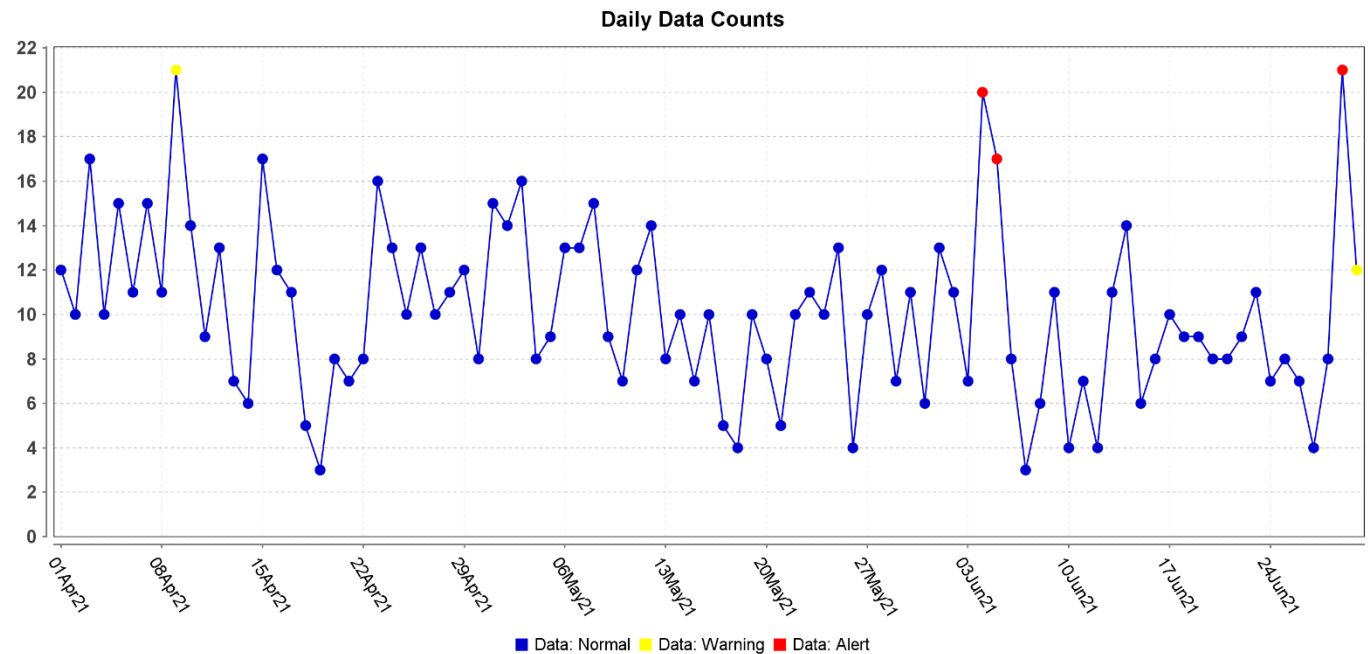
## ESSENCE myAlerts

- Multiple alerts set for county and hospital-level activity across middle TN
- Based on location of reporting hospital (not patient location) and daily number of overdose-related ED visits
- Utilize CDC Opioid Overdose v2 and CDC Stimulant v3 to capture activity
- Email sent to program staff when alert is detected

## ESSENCE myAlert Email, June 8, 2021 – Davidson County, TN



## ESSENCE Time Series: Number of Overdose-related ED Visits, April-June 2021 – Middle Tennessee



Source: ESSENCE-TN, accessed October 25, 2021.

# Overdose Activity Alert Detectors

## ODMAP

- Daily fatal/nonfatal overdose threshold set for Davidson County
- Set to alert program staff/local EMS
- Activates SPIKE Auto Text Program Application when threshold is triggered
- Current Users in Davidson County
  - Metro Public Health Department
  - Nashville Fire Department EMS
  - Metro Nashville Police Department

## ODMAP Spike Alert Email, October 16, 2021 – Montgomery County, TN

From: [odmap@wb.hidta.org](mailto:odmap@wb.hidta.org) <[odmap@wb.hidta.org](mailto:odmap@wb.hidta.org)>

Sent: Saturday, October 16, 2021 6:14 AM

To: REDACTED

Subject: Montgomery, Tennessee Spike Alert

**Attention:** This email originated from a source external to Metro Government. Please exercise sources.

Montgomery, Tennessee is in a spike. There have been 5 total overdose incidents in the last 24 hours.

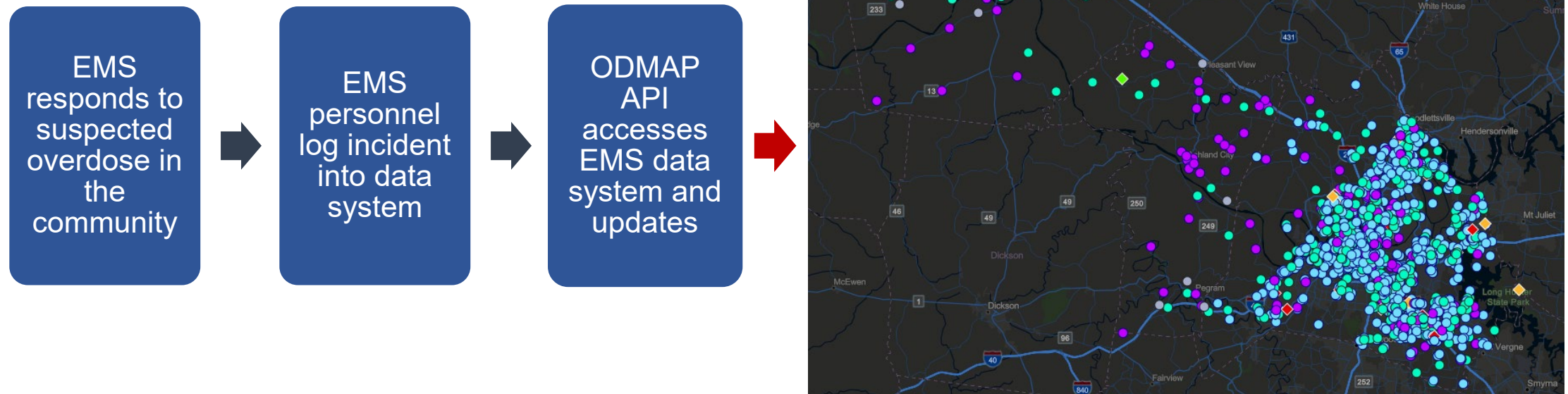
Currently your spike alert threshold is 5 overdose incidents in 24 hours.

This spike alert was requested by the Nashville Metro Health Department .

# Surveillance System Applications

## ODMAP

- Application programming interface (API) provides connection between EMS data system and ODMAP
- Increasingly used by public safety and public health
- For acute overdose response plan, ODMAP spike alert tool utilized



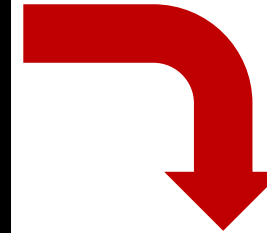
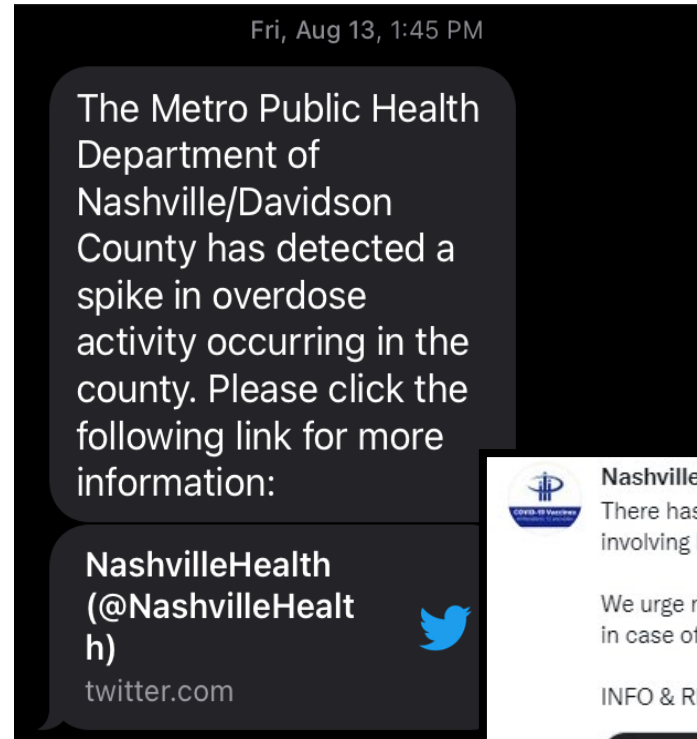
Source: ODMAP, accessed October 22, 2021.

# Surveillance System Applications

## SPIKE Auto Text Program

- Implemented in Davidson County in June 2021
- Four subscriber categories
  - Community/Health Professional
  - Parent/Caregiver
  - Community Member
  - Person Actively Using Substances
- Activated 5 times to date since implementation

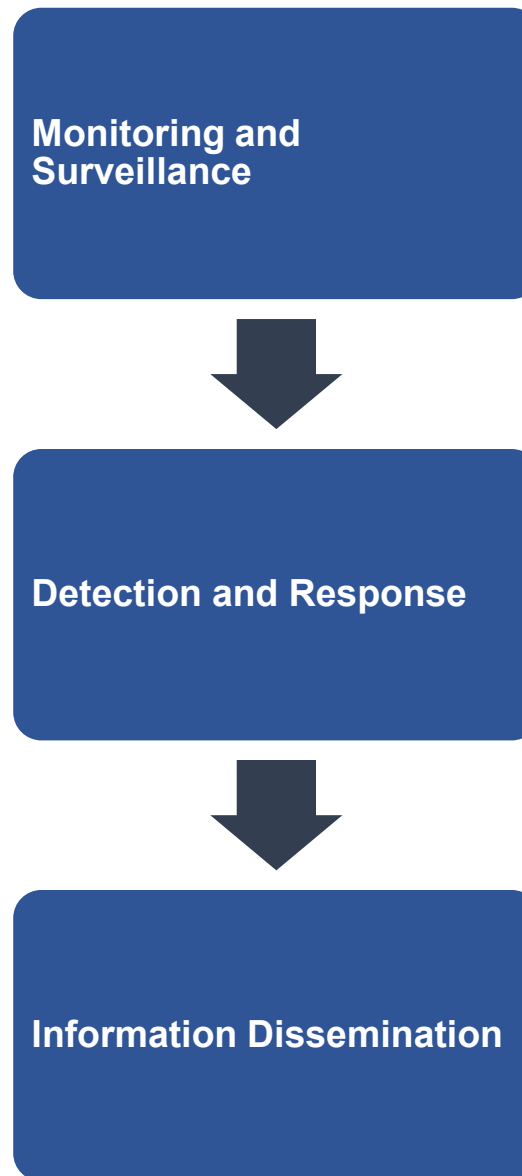
Month Alert Issued	Alert Description
Jun-2021	Increase in suspected overdose-related EMS responses and emergency department visits in the county
Jul-2021	Acute increase in suspected fatal overdoses occurring over a 24-hour period in the county
Aug-2021	Increase in suspected MDMA-related fatal overdoses occurring over previous several weeks
Sep-2021	Increase in suspected fatal/nonfatal overdoses occurring in the eastern part of the county
Oct-2021	Increase in suspected overdose-related EMS responses and emergency department visits occurring over a 3-day period in the county





# Implement Drug Overdose Surveillance System

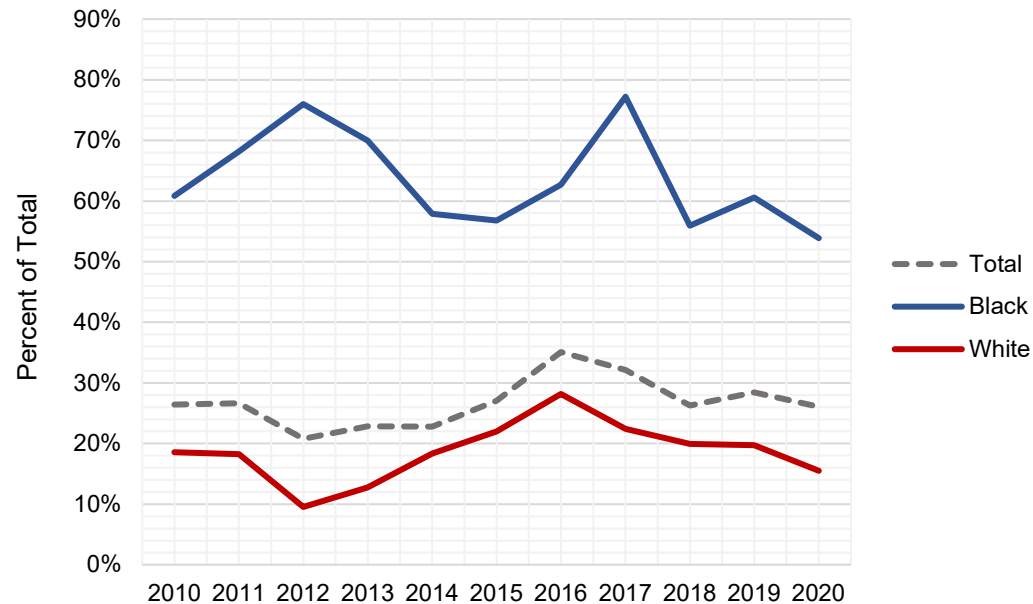
- Monitoring and Surveillance
  - Conduct timely and accurate *monitoring* of overdose activity
- Detection and Response
  - Ability to detect increased or unusual overdose activity
- Information Dissemination
  - Deliver timely and comprehensive *reporting* of fatal/nonfatal overdose activity to inform prevention and response efforts



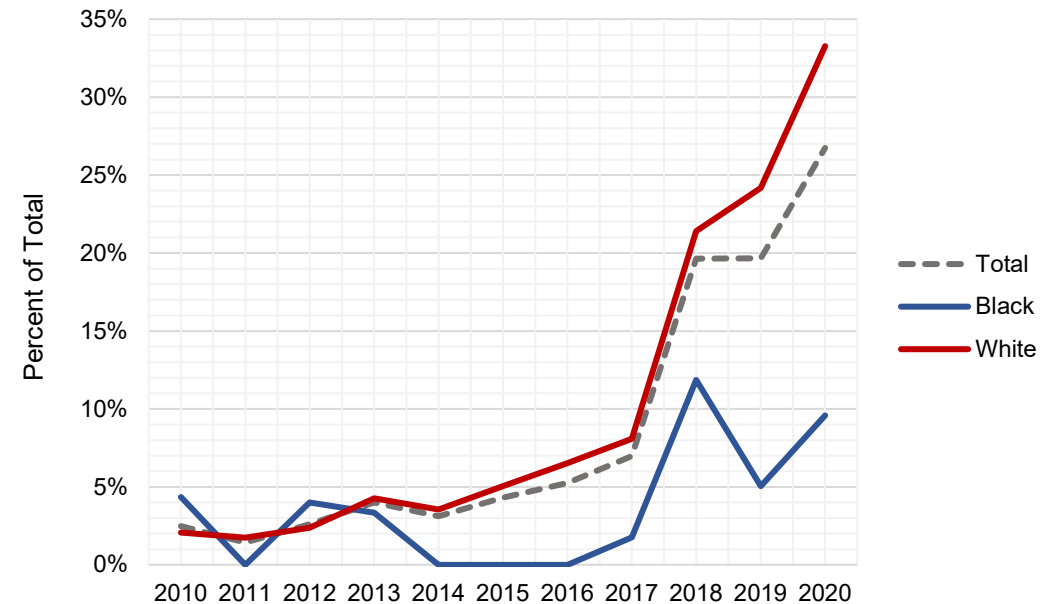
# Monitoring and Surveillance

- Daily analysis of fatal/nonfatal incidents to assess:
  - Number of incidents occurring in the county
    - Baseline and thresholds calculations to detect statistically significant increases
  - Temporal and geographic trends
  - Cluster activity (i.e., hot spots)
  - Characteristics of affected population (i.e., high-risk groups)
  - Change in trends

**Toxicology: Percent of Total Cocaine Detections among Suspected Drug Overdose Deaths by Race, 2010-2020 – Davidson County, TN**



**Toxicology: Percent of Total Methamphetamine Detections among Suspected Drug Overdose Deaths by Race, 2010-2020 – Davidson County, TN**

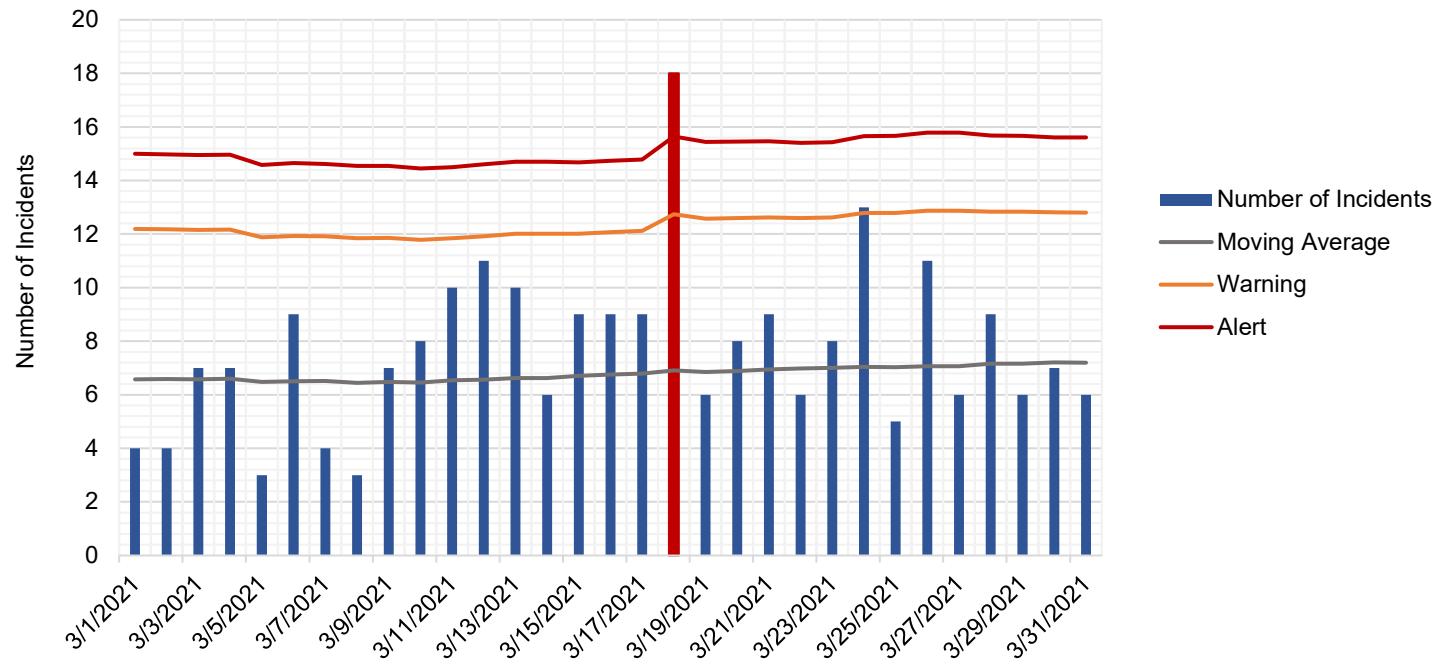


Source: Death Investigation and Decedent Information Database, accessed October 22, 2021.

# Detection and Response

- Surveillance system provides foundation for acute overdose response plan by providing near real-time data
- Capacity to monitor emerging trends and validate across data sources
- Timely detection and communication of significant overdose activity
- Stakeholder engagement

Number of Overdose-related ED Visits, March 2021 – Davidson County, TN



Source: ESSENCE-TN, accessed October 25, 2021.

Receive ODMAP/  
ESSENCE myAlerts

Data Collection

- NFD-EMS/ODMAP
- ESSENCE
- MNP
- Medical Examiner

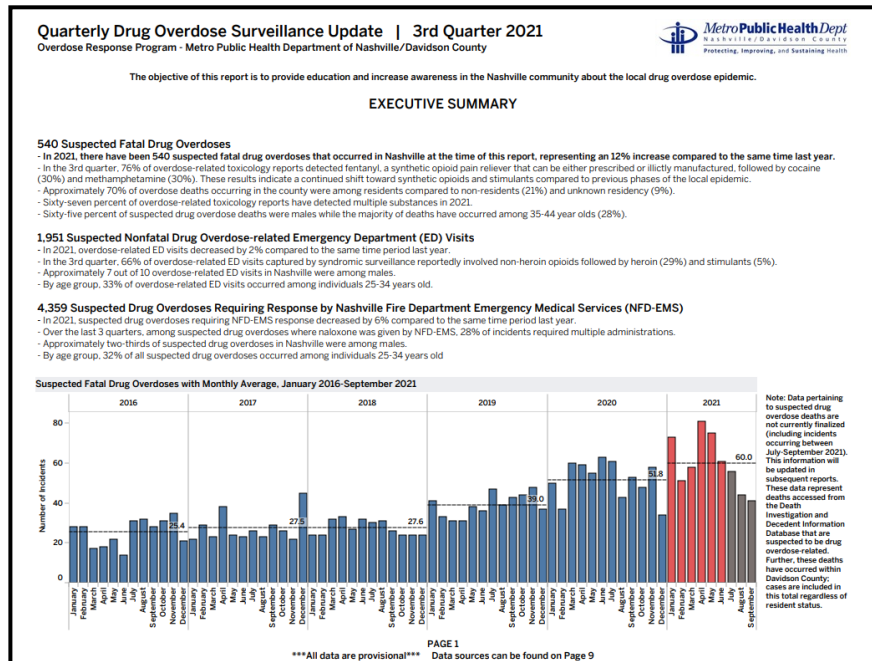
Data Analysis

Communication of  
incident and action  
items for partners and  
community

# Information Dissemination

- Seeks to inform prevention and control efforts
- Surveillance updates (internal, external, and hospitals) including public health and safety advisories
- Monthly mapping and dissemination of overdose activity for MNPD
- Quarterly, public-facing surveillance report
- Data-to-action initiative with prevention partners for targeted naloxone distribution

## Quarterly Surveillance Update – Q3 2021, Davidson County, TN



## Public Health and Safety Advisory - Fake Xanax and Roxicodone Pills February 2021 – Davidson County, TN



### PUBLIC HEALTH AND SAFETY ADVISORY Increase in Drug Overdose Deaths Involving Fake Xanax/Roxicodone Pills

February 12, 2021

#### DESCRIPTION

The purpose of this joint statement is to provide an urgent advisory to the public and community partners regarding an increase in suspected drug overdose deaths occurring in middle Tennessee reported to involve fake Xanax (alprazolam) or Roxicodone (oxycodone hydrochloride) pills.

In addition, local public health and safety officials have observed an increase of suspected drug overdose deaths involving benzodiazepines (such as Xanax) over the last several months. Of note, the most common substance detected with these cases was fentanyl, a synthetic opioid pain reliever that is 50-100 times stronger than morphine.

Taking fake or counterfeit pills puts an individual at greater risk of death due to increased likelihood of such pills also containing fentanyl. A lethal dose of fentanyl is two milligrams or the equivalent of a few grains of salt. **We urge the community to be alert to the life-threatening dangers associated with these products.**

#### IDENTIFYING FAKE/COUNTERFEIT PILLS

Fake pills can be identified by examining the edges and logo of the pill. Compared to fake/counterfeit pills bought on the street, prescription pills will have sharp edges and a well-defined logo.

#### Fake Xanax Pill



#### Fake Roxicodone Pill (30 mg with "M" logo)



# Acute Overdose Response Plan

**Objective:** Utilize drug overdose surveillance system including alert detectors **to detect and rapidly communicate** acute/anomalous overdose activity

## 1. Spike Alert Detection

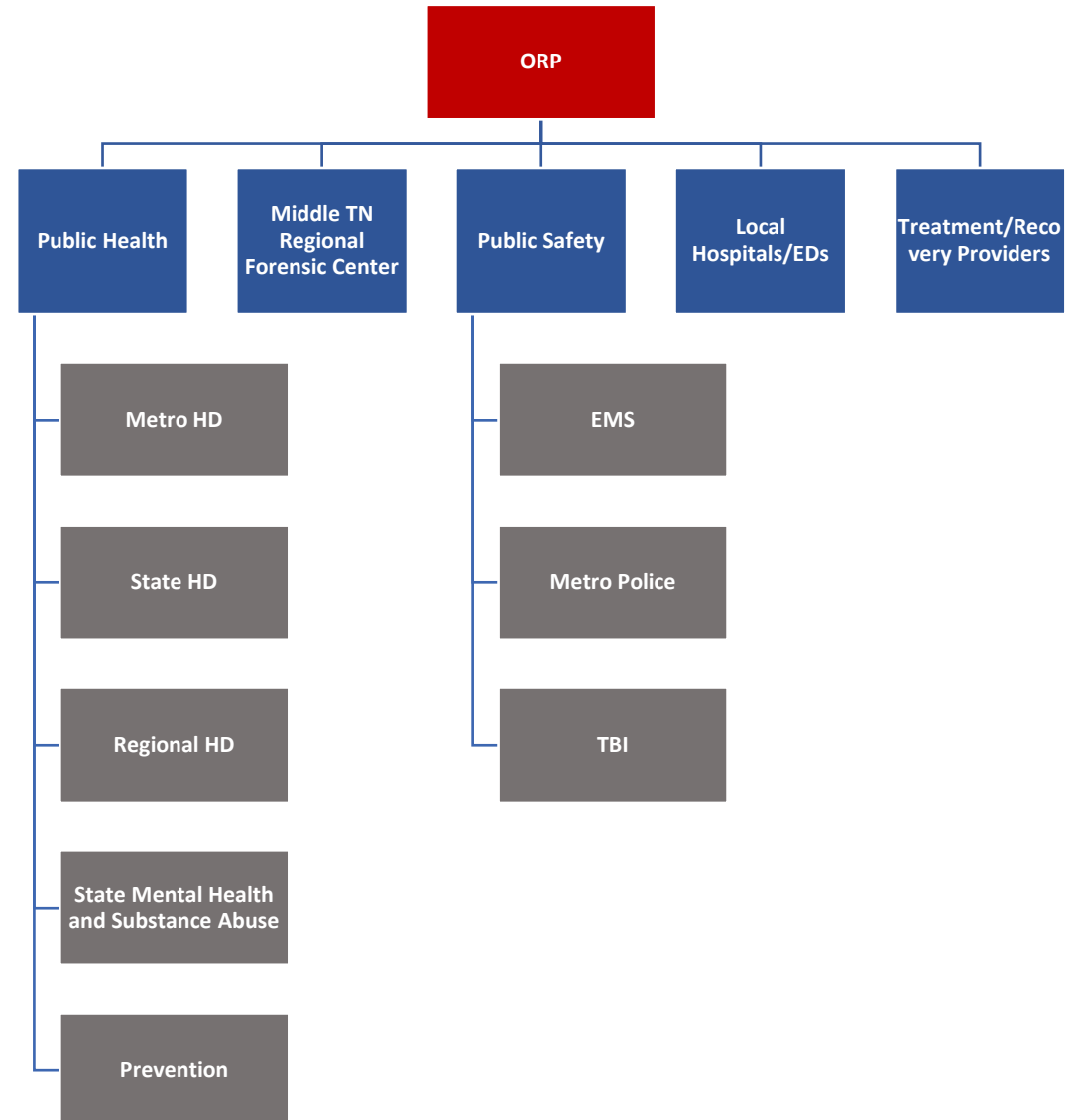
- ODMAP Spike Alert
- ESSENCE myAlerts
- Communication from local medical examiner/law enforcement
- Overdose response phone/email

## 2. Epidemiologists review spike alert and collect available data

- Generate situation report to establish person/place/time characteristics and compare to baseline overdose activity

## 3. Tiered Communication Process

- Internal alerts
  - Core group including public safety, public health, and forensic science
- External alerts
  - Treatment, prevention, law enforcement partner email or phone communication
  - Spike alert text to community members
  - Public health and safety advisory for media channels

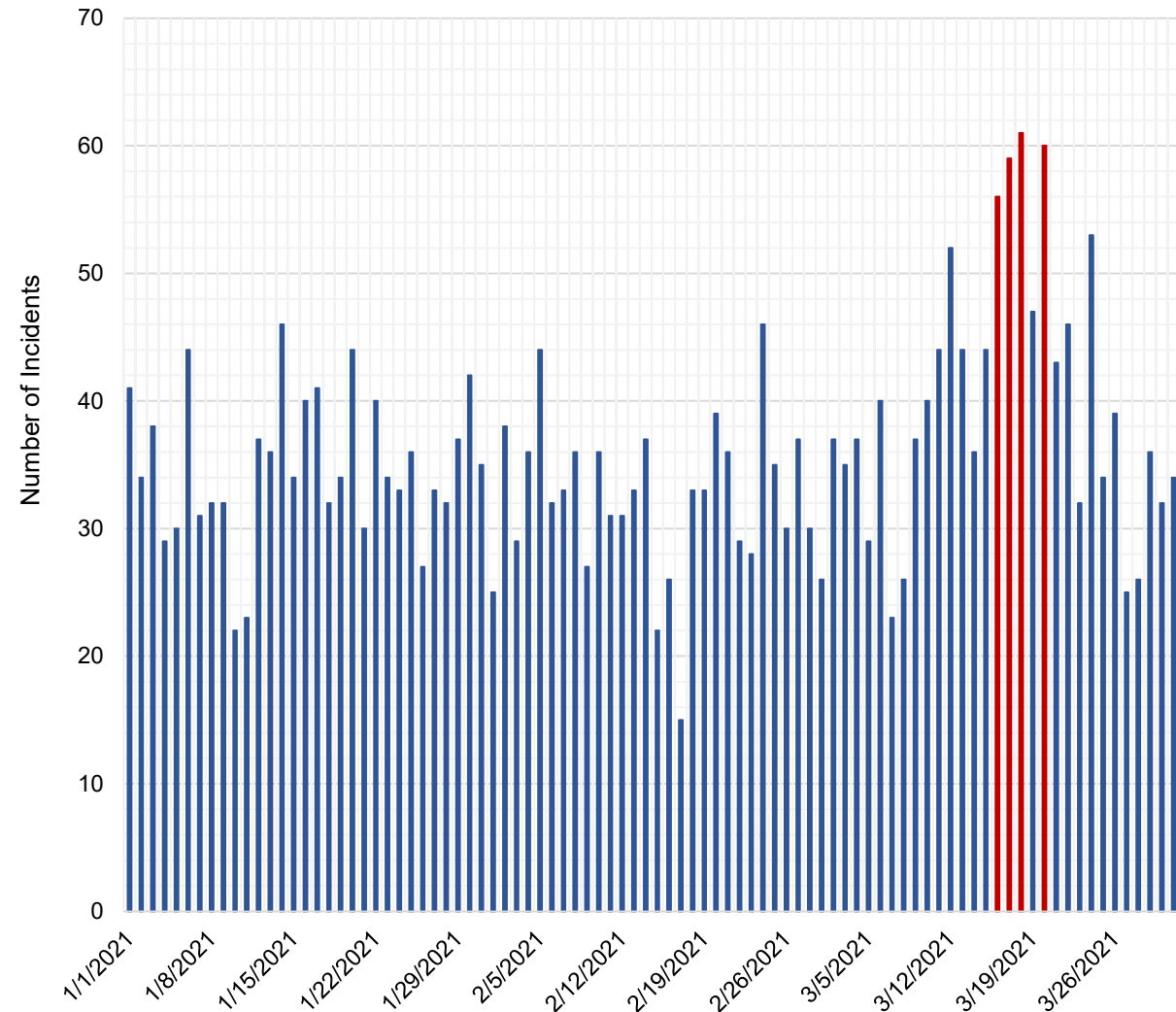


# Spike Alert: March 2021

## Increase in Overdose-related ED Activity

- Received myAlerts for multiple counties across TN in mid-March
- Alert-level activity in Davidson County on March 18
- Broad communication of incident involving news/social media
- Multiple meetings with TDH and regional health departments

Daily number of **suspected nonfatal overdose-related ED visits**, January-March 2021 – TN



Source: ESSENCE-TN, accessed October 25, 2021.

**NashvilleHealth** @NashvilleHealth · Mar 23

Our community continues to battle addiction, with increasing numbers of people needing emergency medical attention for an overdose. The Opioid/Overdose Response and Reduction Program at MPHD has observed a recent spike in visits to emergency departments for nonfatal overdoses.

Metro Public Health Department

### INCREASED OVERDOSE VISITS TO EMERGENCY DEPARTMENTS

In the past week, the Opioid/Overdose Response and Reduction Program has seen a significant increase in nonfatal overdose-related visits to emergency departments in Davidson County.

Compared to the same time last year, emergency departments are seeing 8% more overdose-related visits this year.

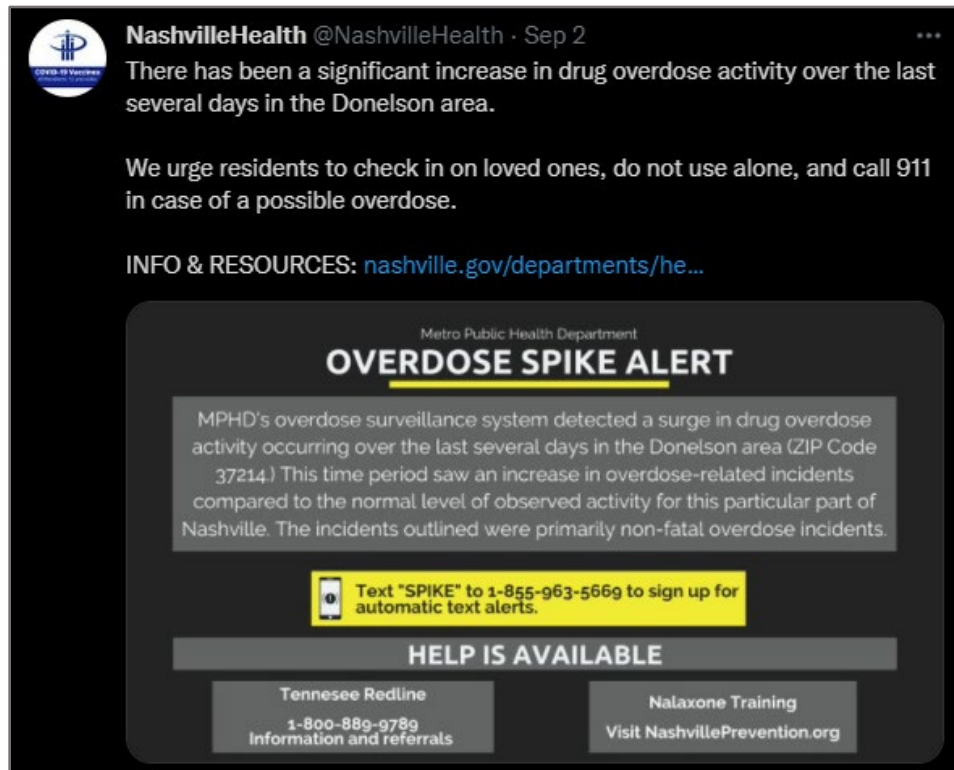
**HELP IS AVAILABLE**

Tennessee Redline 1-800-889-6789 Information and referrals	Addiction screening appointments. Email <a href="mailto:brigid.vingan@nashville.gov">brigid.vingan@nashville.gov</a> or call 615-795-8146 to set up a screening.	Naloxone Training Visit <a href="http://NashvillePrevention.org">NashvillePrevention.org</a>
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# Spike Alert: September 2021

## Increase in Overdose Activity in Cluster Area

- Detected increase via ODMAP and news article from previous day
- Preliminary meeting with ORP, MNPD and prevention partners
- Activated SPIKE Auto Text Program to alert community of increase in eastern part of county



**NashvilleHealth** @NashvilleHealth · Sep 2

There has been a significant increase in drug overdose activity over the last several days in the Donelson area.

We urge residents to check in on loved ones, do not use alone, and call 911 in case of a possible overdose.

INFO & RESOURCES: [nashville.gov/departments/he...](https://nashville.gov/departments/he...)

Metro Public Health Department

### OVERDOSE SPIKE ALERT

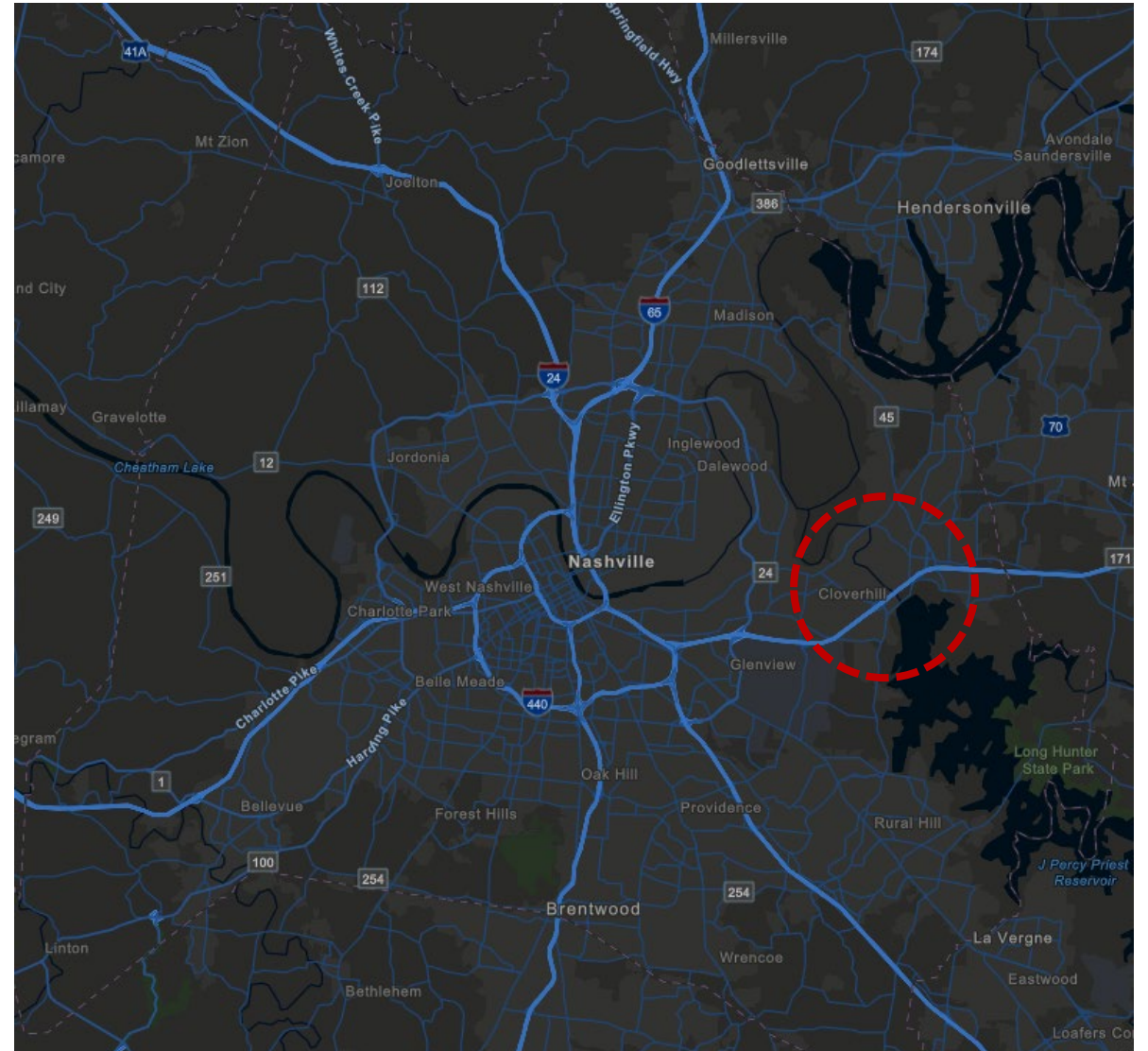
MPHD's overdose surveillance system detected a surge in drug overdose activity occurring over the last several days in the Donelson area (ZIP Code 37214.) This time period saw an increase in overdose-related incidents compared to the normal level of observed activity for this particular part of Nashville. The incidents outlined were primarily non-fatal overdose incidents.

Text "SPIKE" to 1-855-963-5669 to sign up for automatic text alerts.

**HELP IS AVAILABLE**

Tennessee Redline 1-800-889-9789 Information and referrals	Nalaxone Training Visit <a href="https://NashvillePrevention.org">NashvillePrevention.org</a>
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## Overdose Cluster Area, August-September 2021 – Davidson County, TN



Overdose Response Program

Metro Public Health Department of Nashville/Davidson County

Source: ODMAP, accessed October 25, 2021.

## Output: Data to Action Initiatives

- NFD-EMS post-overdose follow-up calls
- Linkage to care by Metro Public Health Department (MPHD) clinics
- Overdose Fatality Review panel
- Targeted naloxone distribution with local prevention partner
- Public health and public safety outreach events driven by hot spot analyses
- SPIKE Auto Text Pilot Program
- Partners in Care Pilot Program: MNPD + mental health clinicians combined response to mental health crises



# Data-to-Action Initiative

- Held monthly since November 2020 and includes ORP, public safety, and prevention partners
- Review fatal and nonfatal geospatial clusters from previous 3 months and other relevant trends
- Map overdose activity with ODMAP and ArcGIS Pro (density-based clustering analyses)
- Allows for targeted naloxone training and distribution in high-activity areas

# Evaluation: Surveillance System and Response

## Strengths

- Near real-time data available to inform acute response efforts (as requested by community stakeholders in 2018)
- Increased communication between public health and public safety
  - Inflow of drugs and seizures – public alerts
  - Substances contributing to fatal/nonfatal overdoses in the area
- Enhanced awareness of emerging fentanyl analogs and novel psychoactive substances from forensic science
- Increased collaboration with including agencies and drug coalitions from different across the state

## Weaknesses

- ODMAP is not ubiquitous in middle TN to provide comprehensive regional understanding of overdose activity
- Lacking data at the local level from key vulnerable populations including:
  - Correctional health
  - Persons experiencing homelessness
  - Minority/new Americans
  - Treatment/recovery providers
- Data sharing hesitancy persists among organizations with crucial data sources
- Potential substances contributing to acute spike events are not always available
- Resource and capacity assessment is needed
- Table-top exercise among state/local partners needs to be conducted (previously held in 2018)

## Future Activities

- Seeking to expand ODMAP and gain access to Regional Forensic Science database for Rutherford County to bolster regional monitoring and response efforts
- Developing data sharing structures to include correctional health and local treatment providers
- Expanding upon the drugs/substances being monitored to include emerging fentanyl analogs and novel psychoactive substances
- Identifying additional data sources to understand public safety/treatment/recovery trends
- Increasing staff to provide education and awareness to targeted populations
- Developing a continuum of care model similar to HIV model (diagnosis, linkage to treatment, etc.)

# Questions and Answers

# Contact Information

## **Haley Hershey, MPH**

Epidemiologist

Overdose Response Program

Metro Public Health Department of Nashville/Davidson County

[Haley.Hershey@nashville.gov](mailto:Haley.Hershey@nashville.gov)

## **Josh Love, MPH**

Epidemiologist

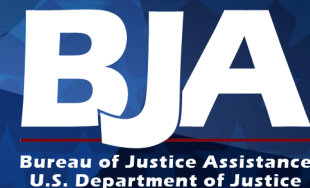
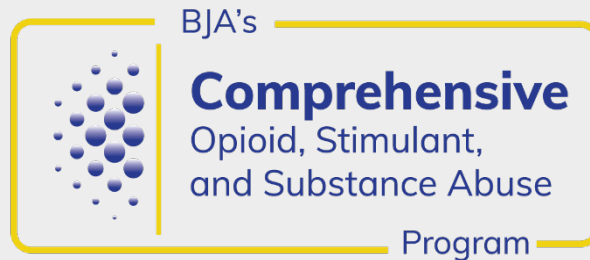
Overdose Response Program

Metro Public Health Department of Nashville/Davidson County

[Josh.Love@nashville.gov](mailto:Josh.Love@nashville.gov)

**Metro Public Health Department – Overdose Response Program**

<https://www.nashville.gov/departments/health/drug-overdose-information>



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<https://www.cossapresources.org>