Public Health Monitoring and Forensic Laboratory: Stronger Drug Trend Data Through Collaboration

Scott Johnston and Patrick Porubsky

KBI Laboratory Drug Trends

THIS IS A CONVERSATION NOT A PRESENTATION

Statewide Drug Landscape

Thank you for what you do!!!

- Two years ago…

- Trends are not people…

Who am I


KANSAS
SERVICE
KBI
DEDICATION
INTEGRITY
1939
BUREAU OF INVESTIGATION

What are we trying to do that is different?

- Stronger together
- Bridging communities
- Building relationships
- Data sharing
- Improving data sets

Laboratory Services

- Evidence Control Center
- Biology Casework
- Biology Databank
- Bloodstain Pattern
- Bloodstain Pattern Analysis (BPA)
- Digital Evidence
- Firearm / Toolmarks
- Latent Prints
- Chemistry
- Toxicology
- Trace

Chemistry and Toxicology

- Forensic Drug Chemist
  - Responsible for the analysis of controlled substances, clandestine laboratory, and general chemical and alcoholic beverage evidence.
- Forensic Toxicologist
  - An interdisciplinary field that applies the methods of analytical chemistry, pharmacology, and toxicology to the analysis and interpretation of drugs and chemicals in biological samples for legal purposes

A Look at Chemistry Volume

- Assignments - 2024

	Chemistry
Cases	7,964
Submissions	8,119
Items	14,007

A Look at Toxicology Volume

- Assignments - 2024

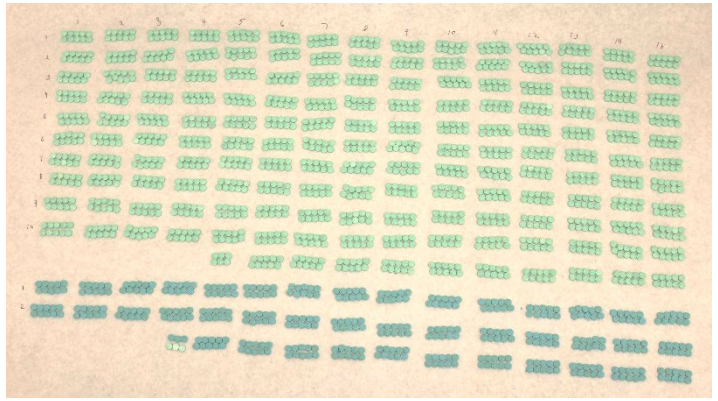
	Toxicology
Cases	3,284
Submissions	3,306
Items	3,463

Drug Data Limitations

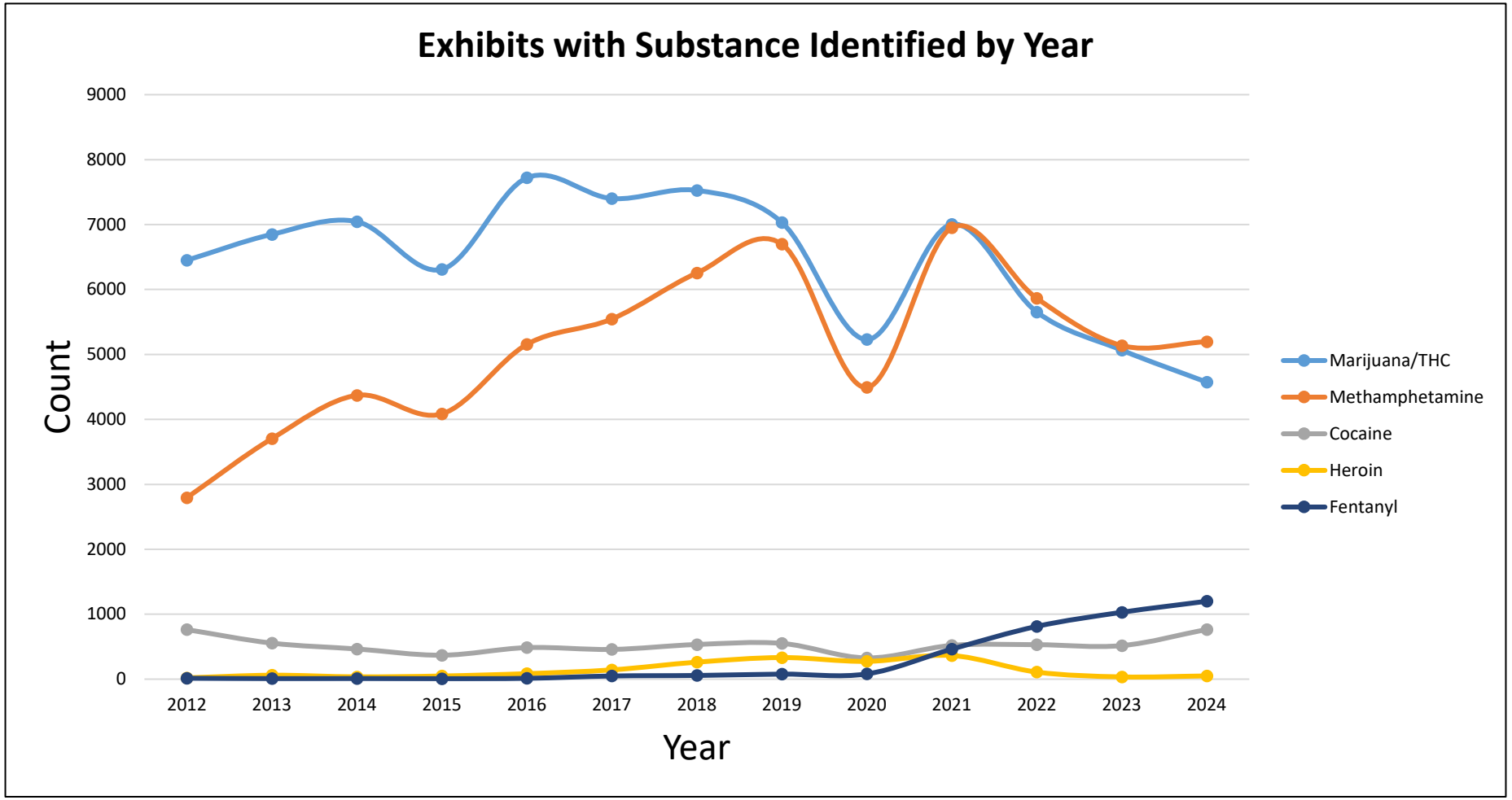
- This drug data is based on the number of items with a substance detected
- Not every item confiscated is submitted
- Not every item submitted to the KBI is analyzed
- Location does not imply drug use at that location
  - No way to remove interdictions (may have been moving through Kansas)
- Multiple drugs can be detected in a single item and are counted separately in this report
- Regional labs – Sedgwick county and Johnson county have their own forensic labs
  - Sedgwick county
    - Limited Submissions
  - Johnson county
    - Limited Submissions

Seized drugs – Kansas Seized Drug Ranking

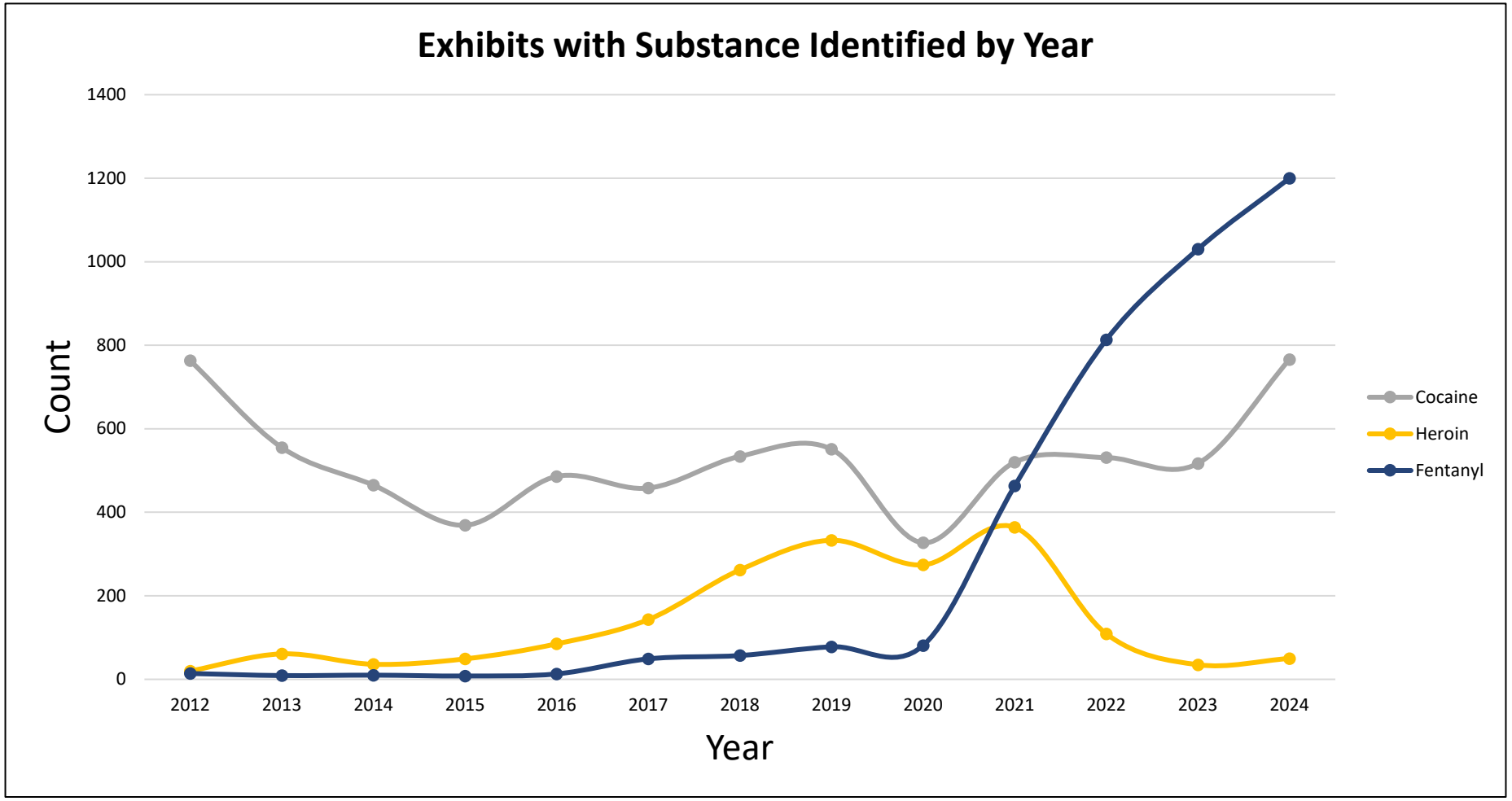
- Top 5 of 2024
  1. Methamphetamine
  2. Marijuana/THC
  3. Fentanyl/Derivatives
  4. No controlled substances detected
  5. Cocaine



Seized drugs



Seized drugs (zoomed)



Seized drugs reported with fentanyl

- 2024 Data

Substance / Substance Combination	Count of Combined Results
Fentanyl	800
Fentanyl fluorofentanyl	76
Fentanyl methamphetamine	41
Fluorofentanyl	22
Fentanyl cocaine	18
Fentanyl tramadol	8
Fentanyl heroin	5
Carfentanil	5
Fentanyl carfentanil	4
Fentanyl fluorofentanyl methamphetamine	3
Fentanyl 4-ANPP	2
Fentanyl acetyl fentanyl	2
Fentanyl alprazolam	2
Fentanyl tetrahydrocannabinol ("THC")	2
Fentanyl cocaine methamphetamine	2
Fentanyl Fluorofentanyl Methamphetamine	2
Fluorofentanyl fenfluramine	1
Fentanyl 3,4-methylenedioxymethamphetamine ("MDMA")	1
Fentanyl amphetamine	1
Fentanyl cocaine heroin	1
Fentanyl codeine diazepam	1
Fentanyl diazepam	1
Fentanyl despropionyl fluorofentanyl	1
Fentanyl heroin fluorofentanyl	1
Fentanyl MDMB-BUTINACA	1
Fentanyl methamphetamine tramadol	1
Fluorofentanyl Methadone MDMB-BUTINACA	1
Fentanyl Methamphetamine carfentanil	1
Fentanyl methamphetamine heroin	1
Fluorofentanyl methamphetamine	1
Fentanyl methamphetamine tetrahydrocannabinol ("THC")	1
Fentanyl Oxycodone	1

Seized drugs reported with fentanyl

- 2024 Data

Substance / Substance Combination	Count of Combined Results
Fentanyl	800
Fentanyl fluorofentanyl	76
Fentanyl methamphetamine	41
Fluorofentanyl	22
Fentanyl cocaine	18
Fentanyl tramadol	8
Fentanyl heroin	5
Carfentanil	5
Fentanyl carfentanil	4
Fentanyl fluorofentanyl methamphetamine	3
Fentanyl 4-ANPP	2
Fentanyl acetyl fentanyl	2
Fentanyl alprazolam	2
Fentanyl tetrahydrocannabinol ("THC")	2
Fentanyl cocaine methamphetamine	2
Fentanyl Fluorofentanyl Methamphetamine	2
Fluorofentanyl fenfluramine	1
Fentanyl 3,4-methylenedioxymethamphetamine ("MDMA")	1
Fentanyl amphetamine	1
Fentanyl cocaine heroin	1
Fentanyl codeine diazepam	1
Fentanyl diazepam	1
Fentanyl despropionyl fluorofentanyl	1
Fentanyl heroin fluorofentanyl	1
Fentanyl MDMB-BUTINACA	1
Fentanyl methamphetamine tramadol	1
Fluorofentanyl Methadone MDMB-BUTINACA	1
Fentanyl Methamphetamine carfentanil	1
Fentanyl methamphetamine heroin	1
Fluorofentanyl methamphetamine	1
Fentanyl methamphetamine tetrahydrocannabinol ("THC")	1
Fentanyl Oxycodone	1

Seized drugs reported with fentanyl

- 2024 Data

Substance / Substance Combination	Count of Combined Results
Fentanyl	800
Fentanyl fluorofentanyl	76
Fentanyl methamphetamine	41
Fluorofentanyl	22
Fentanyl cocaine	18
Fentanyl tramadol	8
Fentanyl heroin	5
Carfentanil	5
Fentanyl carfentanil	4
Fentanyl fluorofentanyl methamphetamine	3
Fentanyl 4-ANPP	2
Fentanyl acetyl fentanyl	2
Fentanyl alprazolam	2
Fentanyl tetrahydrocannabinol ("THC")	2
Fentanyl cocaine methamphetamine	2
Fentanyl Fluorofentanyl Methamphetamine	2
Fluorofentanyl fenfluramine	1
Fentanyl 3,4-methylenedioxymethamphetamine ("MDMA")	1
Fentanyl amphetamine	1
Fentanyl cocaine heroin	1
Fentanyl codeine diazepam	1
Fentanyl diazepam	1
Fentanyl despropionyl fluorofentanyl	1
Fentanyl heroin fluorofentanyl	1
Fentanyl MDMB-BUTINACA	1
Fentanyl methamphetamine tramadol	1
Fluorofentanyl Methadone MDMB-BUTINACA	1
Fentanyl Methamphetamine carfentanil	1
Fentanyl methamphetamine heroin	1
Fluorofentanyl methamphetamine	1
Fentanyl methamphetamine tetrahydrocannabinol ("THC")	1
Fentanyl Oxycodone	1

Seized drugs reported with fentanyl

- 2024 Data

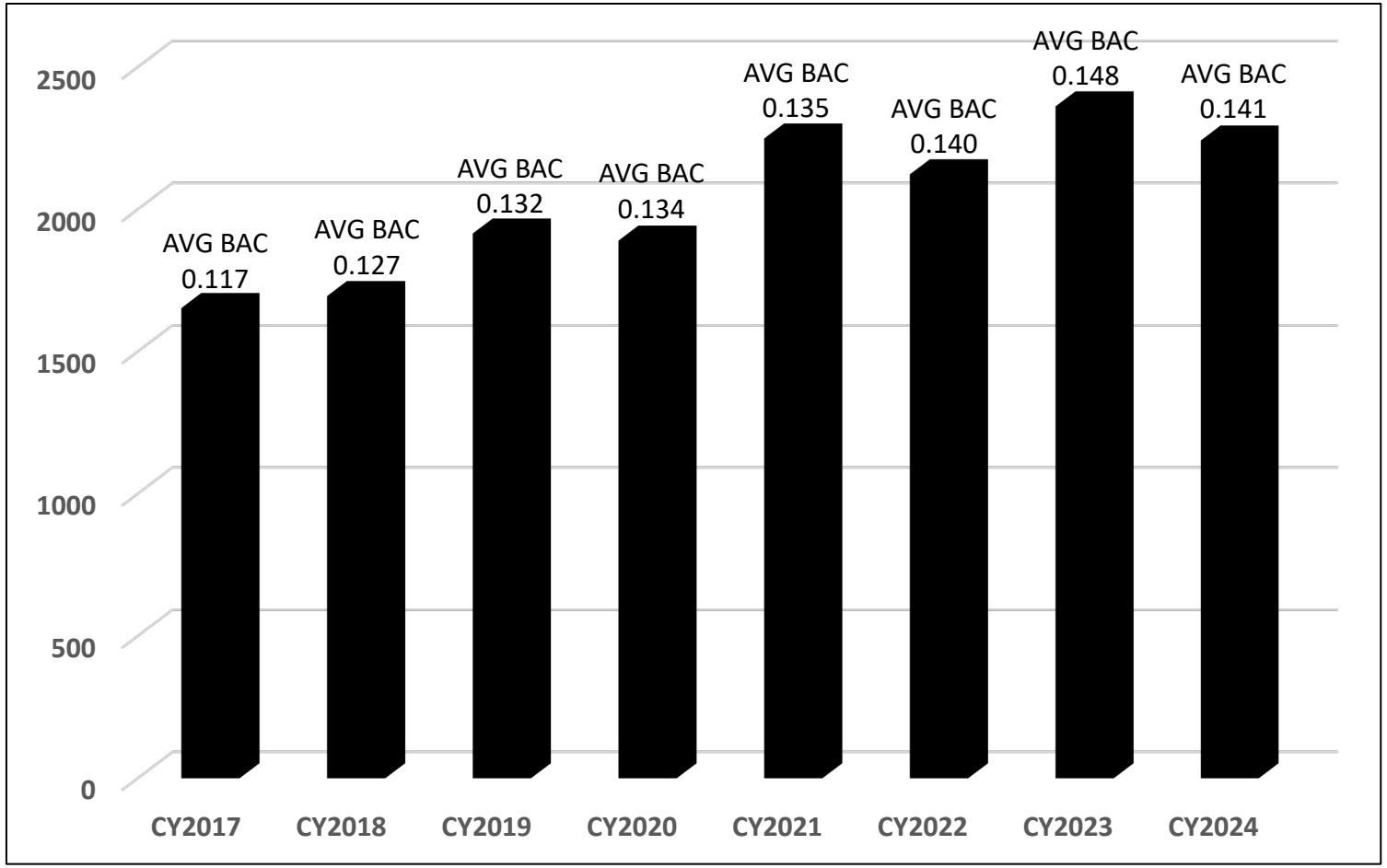
Substance / Substance Combination	Count of Combined Results
Fentanyl	800
Fentanyl fluorofentanyl	76
Fentanyl methamphetamine	41
Fluorofentanyl	22
Fentanyl cocaine	18
Fentanyl tramadol	8
Fentanyl heroin	5
Carfentanil	5
Fentanyl carfentanil	4
Fentanyl fluorofentanyl methamphetamine	3
Fentanyl 4-ANPP	2
Fentanyl acetyl fentanyl	2
Fentanyl alprazolam	2
Fentanyl tetrahydrocannabinol ("THC")	2
Fentanyl cocaine methamphetamine	2
Fentanyl Fluorofentanyl Methamphetamine	2
Fluorofentanyl fenfluramine	1
Fentanyl 3,4-methylenedioxymethamphetamine ("MDMA")	1
Fentanyl amphetamine	1
Fentanyl cocaine heroin	1
Fentanyl codeine diazepam	1
Fentanyl diazepam	1
Fentanyl despropionyl fluorofentanyl	1
Fentanyl heroin fluorofentanyl	1
Fentanyl MDMB-BUTINACA	1
Fentanyl methamphetamine tramadol	1
Fluorofentanyl Methadone MDMB-BUTINACA	1
Fentanyl Methamphetamine carfentanil	1
Fentanyl methamphetamine heroin	1
Fluorofentanyl methamphetamine	1
Fentanyl methamphetamine tetrahydrocannabinol ("THC")	1
Fentanyl Oxycodone	1

Toxicology –

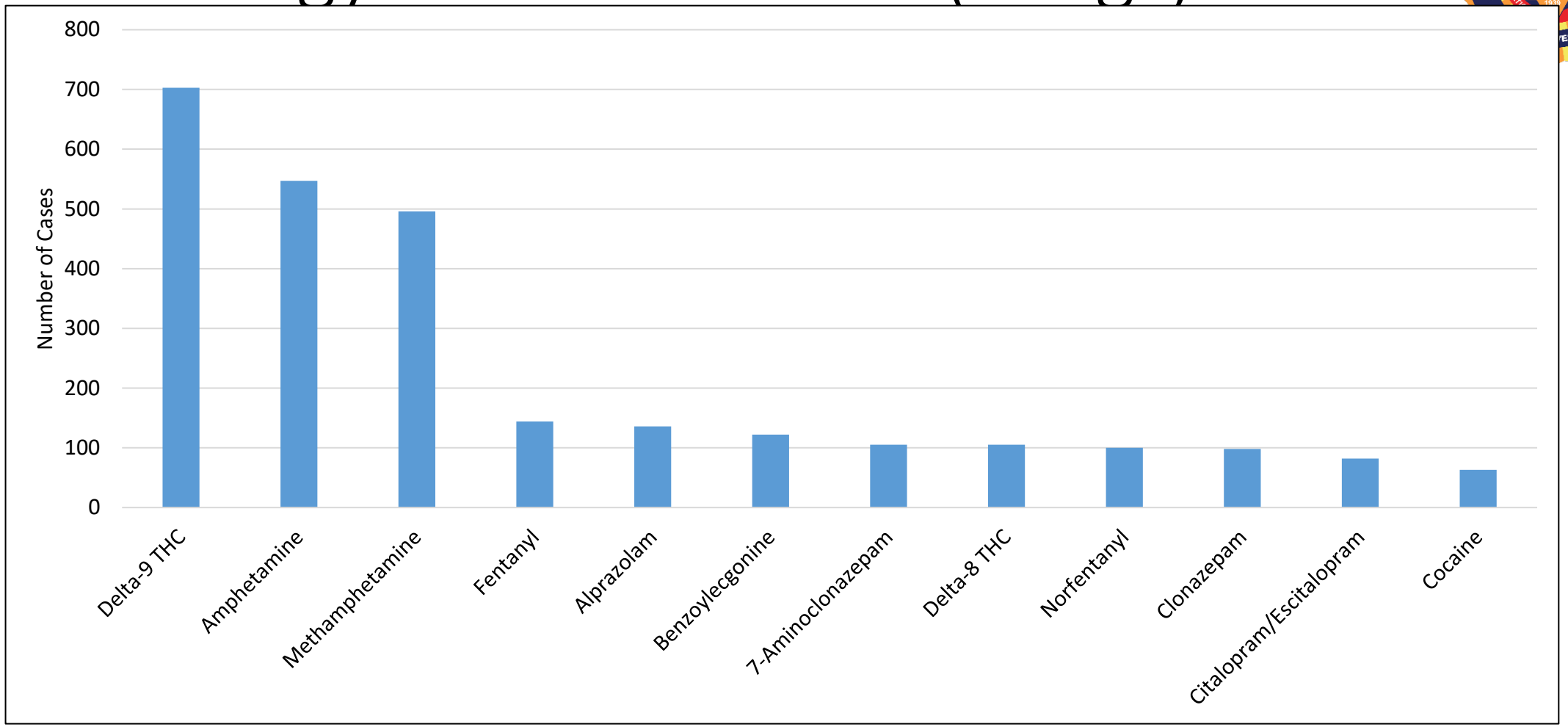
- An interdisciplinary field that applies the methods of analytical chemistry, pharmacology, and toxicology to the analysis and interpretation of drugs and chemicals in biological samples for legal purposes.
- Mainly
  - Blood alcohol
    - (both ante-mortem and post-mortem; majority human performance)
  - Blood drug
    - (both ante-mortem and post-mortem; majority human performance)
  - Urine Drug
    - (ante-mortem; majority human performance)

Blood Alcohol Testing (BAC)

Number of Tests/Year

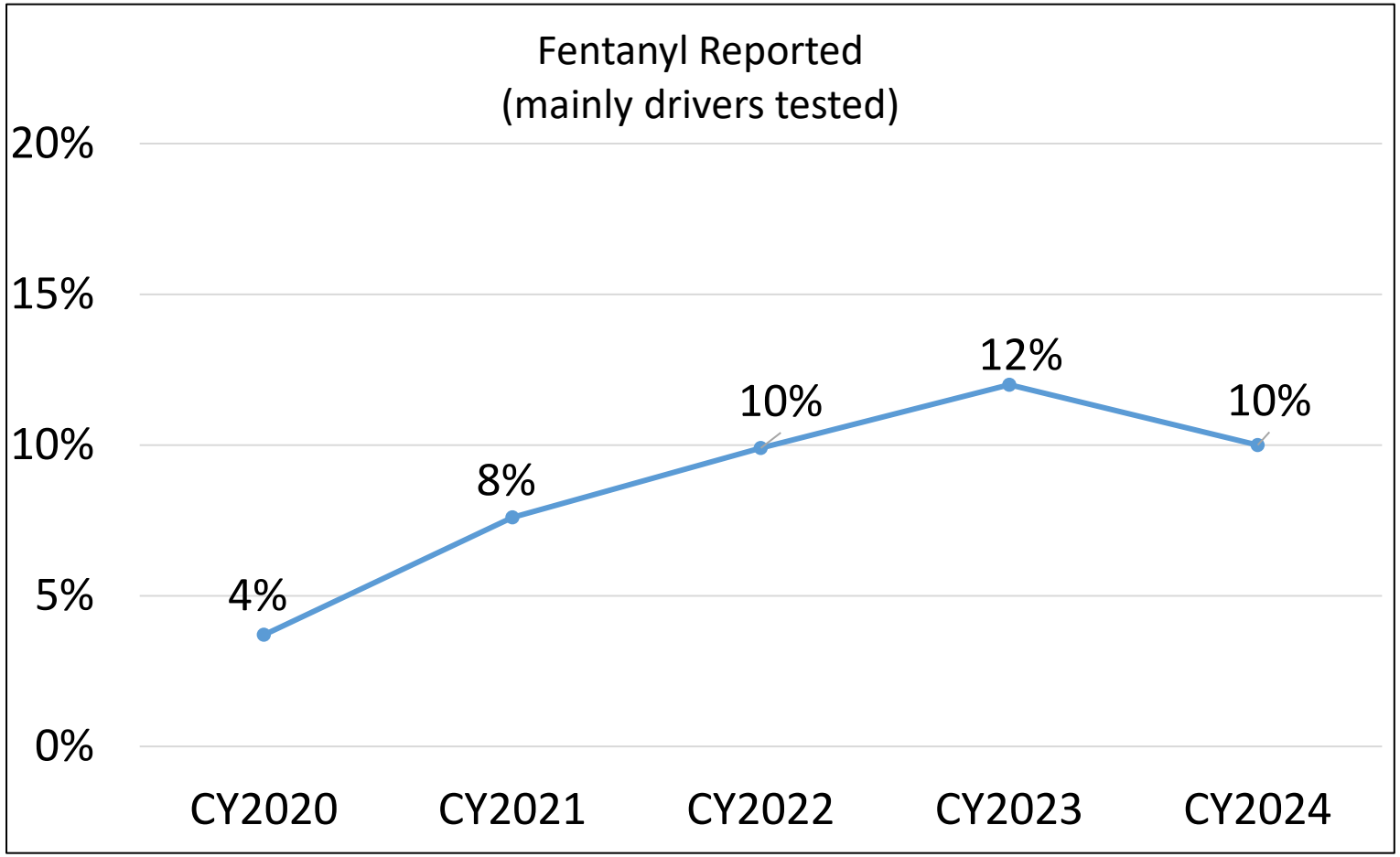


Toxicology 2024 Casework (Drugs)



Note 1: Fentanyl, Alprazolam, and 7-Aminoclonazepam results do not distinguish between illicit use and prescription use.
Note 2: Impairment cannot be determined based solely on the toxicology results.

Toxicology Fentanyl



Polydrug use in Kansas

What can we learn from impaired driving toxicology data

Polydrug Toxicology Observations
Fentanyl and Meth

- 2024 Total blood or urine drug cases
  - 1378
- 2024 Total blood or urine drug cases with fentanyl identified
  - 140 (~10% of total)
- 2024 Total blood or urine drug cases with methamphetamine identified
  - 491 (~36% of total)
- 2024 Total blood or urine drug cases with methamphetamine AND fentanyl identified
  - 57 (~4% of total)

Polydrug Toxicology Observations
Meth and THC

- 2024 Total blood or urine drug cases
  - 1378
- 2024 Total blood or urine drug cases with THC (or a metabolite) identified
  - 816 (~59% of total)
- 2024 Total blood or urine drug cases with methamphetamine identified
  - 491 (~36% of total)
- 2024 Total blood or urine drug cases with methamphetamine AND THC (or a metabolite) identified
  - 192 (~14% of total)

Polydrug Toxicology Observations
Benzos and THC

- 2024 Total blood or urine drug cases
  - 1378
- 2024 Total blood or urine drug cases with THC (or a metabolite) identified
  - 816 (~59% of total)
- 2024 Total blood or urine drug cases with the one of the top 5 benzos identified
  - 313 (~23% of total)
- 2024 Total blood or urine drug cases with one of the top 5 benzos AND THC (or a metabolite) identified
  - 153 (~11% of total)

Polydrug Toxicology Observations
Benzos and Meth

- 2024 Total blood or urine drug cases
  - 1378
- 2024 Total blood or urine drug cases with methamphetamine identified
  - 491 (~36% of total)
- 2024 Total blood or urine drug cases with the top 5 benzos identified
  - 313 (~23% of total)
- 2024 Total blood or urine drug cases with methamphetamine AND one of the top 5 benzos identified
  - 88 (~6% of total)

Collaborative Partnerships

- The KBI Laboratory's chance to provide proactive assistance in the state's fight against the overdose epidemic
- Can we help build relationships between public health and law enforcement??

- KDHE
  - Substance Use Disorder & Overdose Prevention
    - Overdose to Action (OD2A) grant
- HIDTA
  - Overdose Response Strategies

Example of LEO Outreach

- The following slides are a summary of what is being presented to law enforcement officers to inform them about one of the initiatives that we are working on with KDHE to expand post-mortem toxicology submissions to the KBI Laboratory for unattended deaths that are not getting full autopsies and toxicology elsewhere…

Post-Mortem Toxicology Expansion

Release of Post-Mortem Toxicology Data

- Initiative:
  - KBI has partnered with KDHE to expand the use of post-mortem toxicology data throughout the state of Kansas.

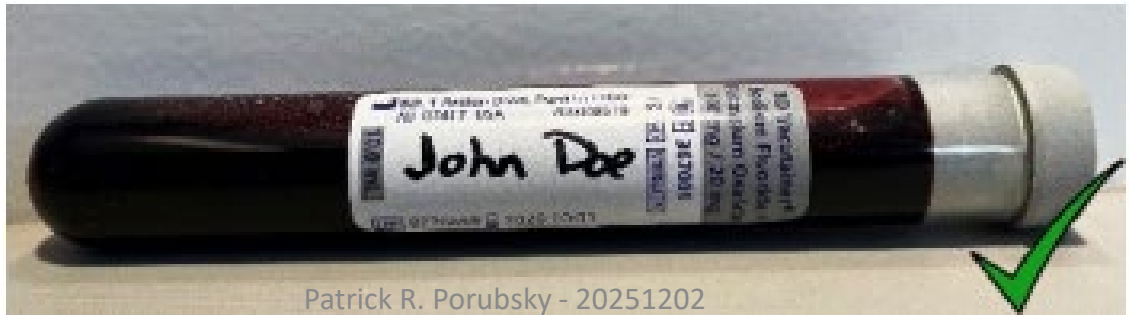
- How?:
  - KDHE has received funding through a federal Overdose Data to Action (OD2A) grant to support expanded post-mortem toxicology testing.

- Why?:
  - Toxicology results from unattended deaths can:
    - Aid KDHE in providing programs to remove barriers that keep Kansans with Substance Use Disorder and Opioid Use Disorder from accessing the treatment services needed to effectively take control of their mental health.

Release of Post-Mortem Toxicology Data

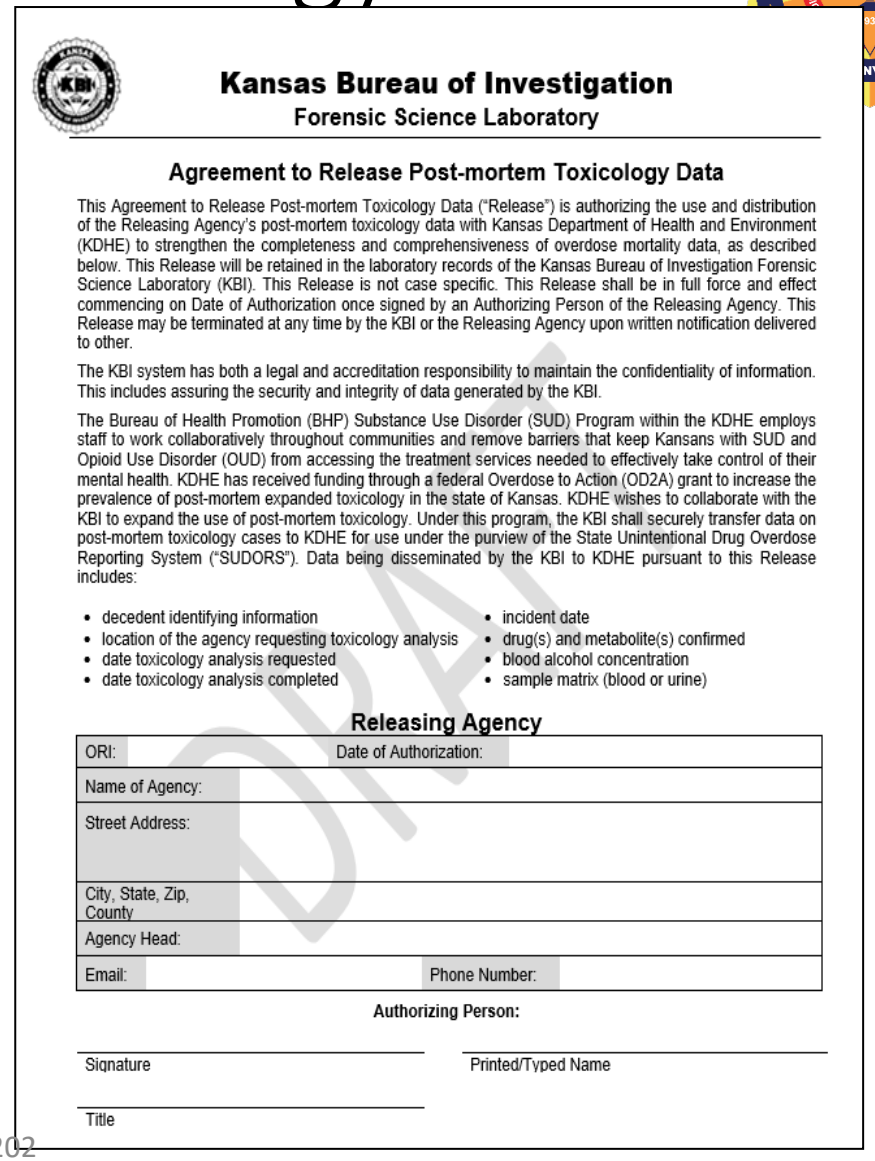
- Get your Agency Involved:
  - #1) Submit post-mortem blood samples from unattended deaths/suspected overdoses to the KBI Toxicology section with chain of custody.

    - Blood sample should be collected by coroner/medical professional/etc.
      - Collect a blood sample using a 10 mL potassium oxalate/sodium fluoride (gray top) blood collection tube.
      - Postmortem samples should be labeled with location of sample collection (e.g., heart, femoral)
      - Write the subject's name on the blood tube/specimen container and put all other pertinent information on the evidence custody receipt
      - Above information also found in the KBI Evidence Submission Guidelines



Release of Post-Mortem Toxicology Data

- Get your Agency Involved:
  - #2) Sign an "Agreement to Release Post-mortem Toxicology Data"
    - Allows the KBI to share post-mortem toxicology data with KDHE
    - Data will be used by the State Unintentional Drug Overdose Reporting System "SUDORS"



Kansas Bureau of Investigation
Forensic Science Laboratory

Agreement to Release Post-mortem Toxicology Data

This Agreement to Release Post-mortem Toxicology Data ("Release") is authorizing the use and distribution of the Releasing Agency's post-mortem toxicology data with Kansas Department of Health and Environment (KDHE) to strengthen the completeness and comprehensiveness of overdose mortality data, as described below. This Release will be retained in the laboratory records of the Kansas Bureau of Investigation Forensic Science Laboratory (KBI). This Release is not case specific. This Release shall be in full force and effect commencing on Date of Authorization once signed by an Authorizing Person of the Releasing Agency. This Release may be terminated at any time by the KBI or the Releasing Agency upon written notification delivered to other.

The KBI system has both a legal and accreditation responsibility to maintain the confidentiality of information. This includes assuring the security and integrity of data generated by the KBI.

The Bureau of Health Promotion (BHP) Substance Use Disorder (SUD) Program within the KDHE employs staff to work collaboratively throughout communities and remove barriers that keep Kansans with SUD and Opioid Use Disorder (OUD) from accessing the treatment services needed to effectively take control of their mental health. KDHE has received funding through a federal Overdose to Action (OD2A) grant to increase the prevalence of post-mortem expanded toxicology in the state of Kansas. KDHE wishes to collaborate with the KBI to expand the use of post-mortem toxicology. Under this program, the KBI shall securely transfer data on post-mortem toxicology cases to KDHE for use under the purview of the State Unintentional Drug Overdose Reporting System ("SUDORS"). Data being disseminated by the KBI to KDHE pursuant to this Release includes:

- decedent identifying information
- location of the agency requesting toxicology analysis
- date toxicology analysis requested
- date toxicology analysis completed
- incident date
- drug(s) and metabolite(s) confirmed
- blood alcohol concentration
- sample matrix (blood or urine)

Releasing Agency

ORI:	Date of Authorization:
Name of Agency:	
Street Address:	
City, State, Zip, County	
Agency Head:	
Email:	Phone Number:

Authorizing Person:

Signature _____ Printed/Typed Name _____

Title _____

DRAFT

State Unintentional Drug Overdose Reporting System “SUDORS”

Important Data Considerations

Data come from death certificate information, medical examiner or coroner reports, and forensic toxicology results entered into the State Unintentional Drug Overdose Reporting System (SUDORS). Jurisdictions report occurrent drug overdose deaths (i.e., all overdose deaths that occurred within the jurisdiction regardless of decedent residence). Percentages are among decedents with known information (e.g., counts for demographic data and month of death may not add to the total due to missing information). Drug-, sex-, and race/ethnicity-specific rates are age-standardized to the 2010 U.S. Census population. The number of deaths, and corresponding rates, in SUDORS might not match the number and rate in CDC's Wide-ranging Online Data for Epidemiologic Research (CDC WONDER) .

From https://www.cdc.gov/drugoverdose/fatal/dashboard/index.html

Questions?

Thank you for what you do!!

Patrick R. Porubsky
Patrick.Porubsky@kbi.ks.gov

Kansas
Department of Health and Environment
Division of Public Health

Integrating Public Health and Forensic Laboratory Data to Track Drug Trends in Kansas

Scott Johnston, MPH – Epidemiologist, KDHE | 12-2-2025

Learning Objectives:

After this presentation you will be able to:

- Understand how the Kansas Bureau of Investigation (KBI) and the Kansas Department of Health and Environment (KDHE) monitor overdose trends in Kansas.
- Describe recent trends in overdose, including the substances most identified in fatal overdose.

Overview:

- Overdose Data to Action
- Strategy 2: Non-Fatal Overdose Surveillance
- Strategy 3: Fatal Overdose Surveillance
- Other Strategies: Public Safety Partnerships
- Prevention Strategies: Data to Action

Overdose Data to Action – Surveillance Strategies

Strategy 1: Data Infrastructure

- Laboratory funding and data management.

Strategy 2: Non-Fatal Overdose Surveillance

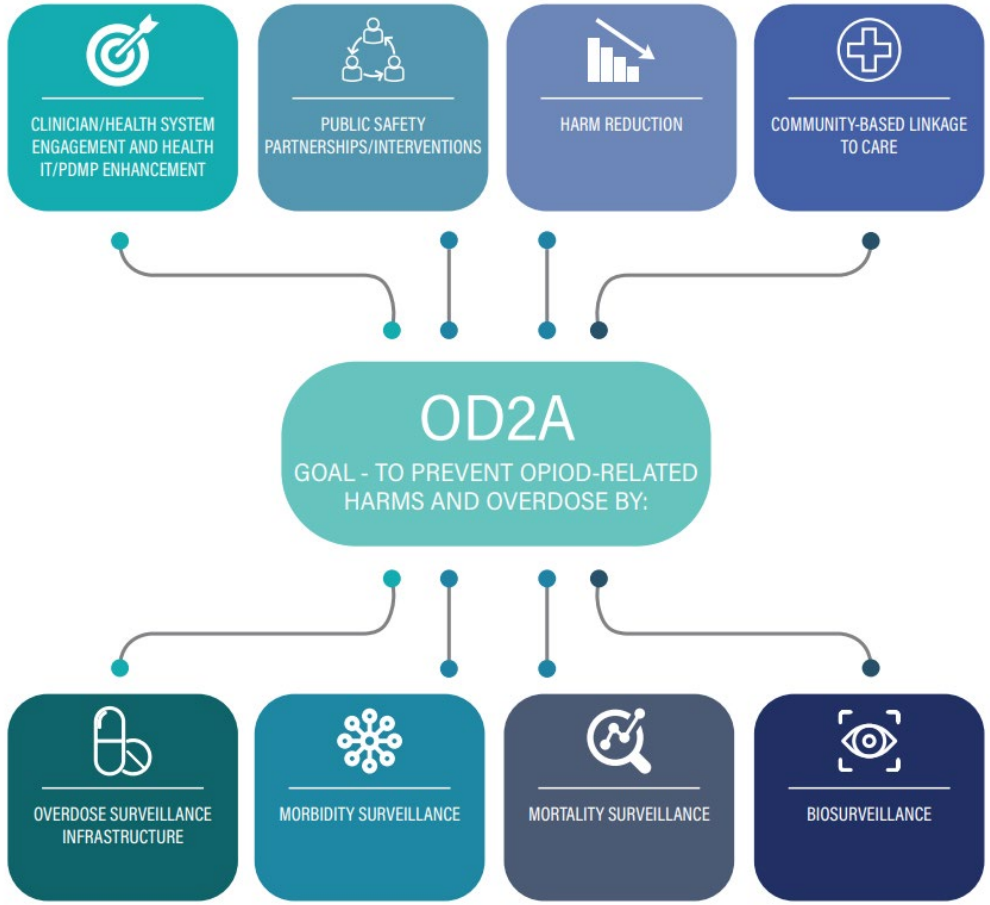
- Emergency department visit data and spike detection.

Strategy 3: Fatal Overdose Surveillance

- Comprehensive death data collection.

Strategy 4: Biosurveillance

- Enhanced toxicology testing of suspected overdoses.



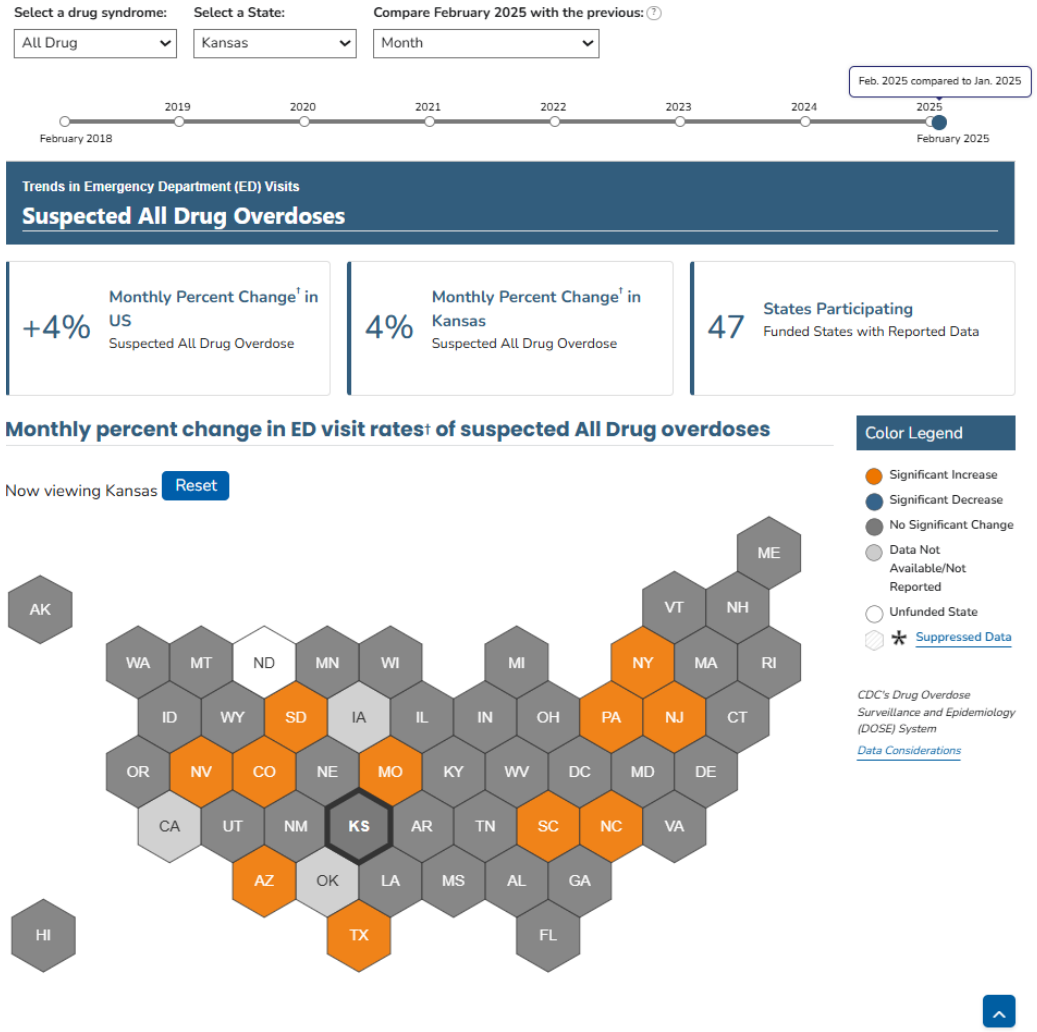
Strategy 2: Non-Fatal Overdose Surveillance

Syndromic Surveillance:

- 91% of Kansas emergency departments participate.
- More than 90% of visits reported within 24 hours.
- Used across KDHE sections to monitor injuries, infectious disease, and other public health issues.

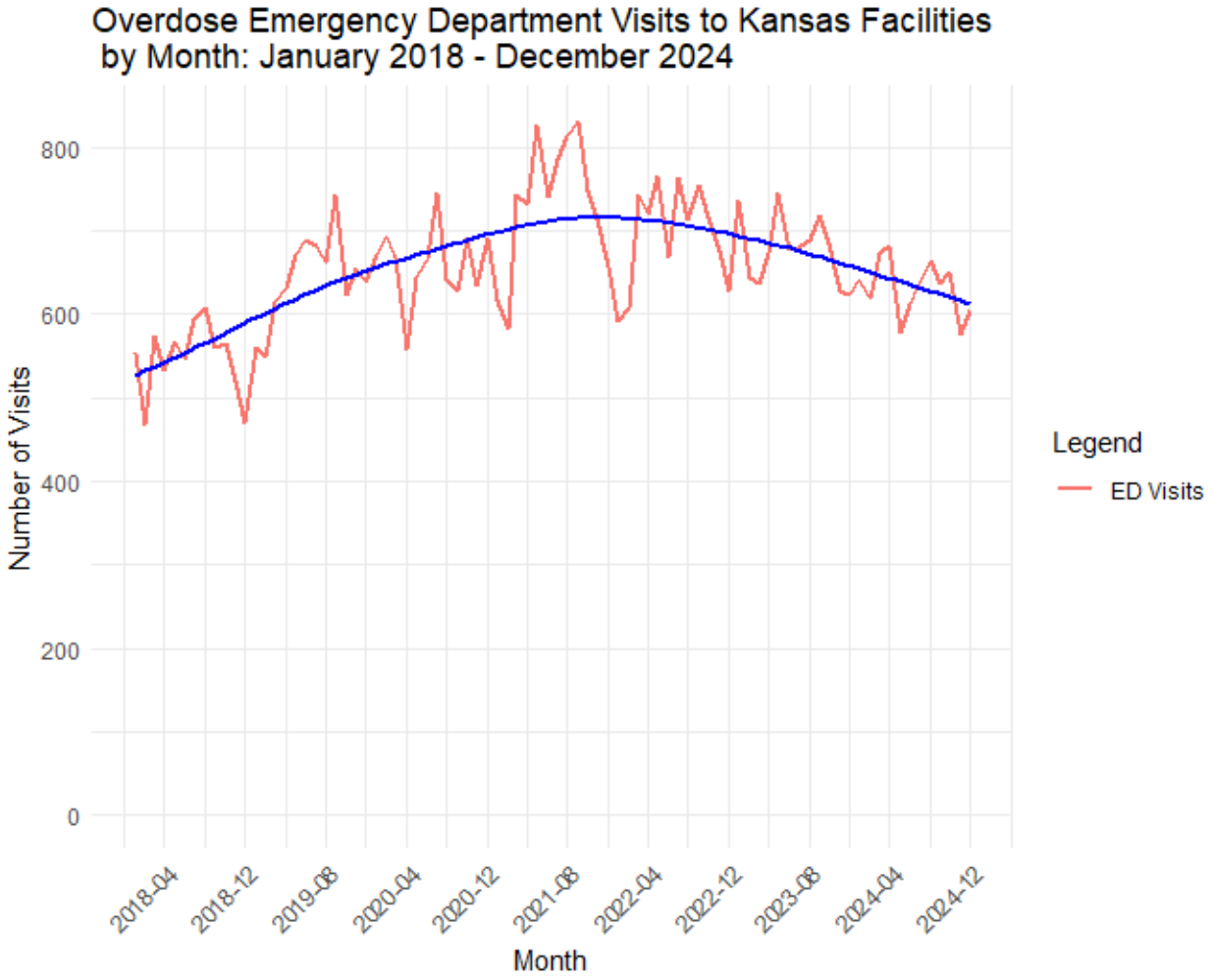
KS OD2A monitors suspected overdoses:

- Monthly for monitoring trends.
- Weekly for identifying unusual increases.



Non-Fatal Overdose Surveillance - Trends

- Average of 656 suspected overdose ED visits per month.
- Peaked at 832 in September 2021, declining gradually since.

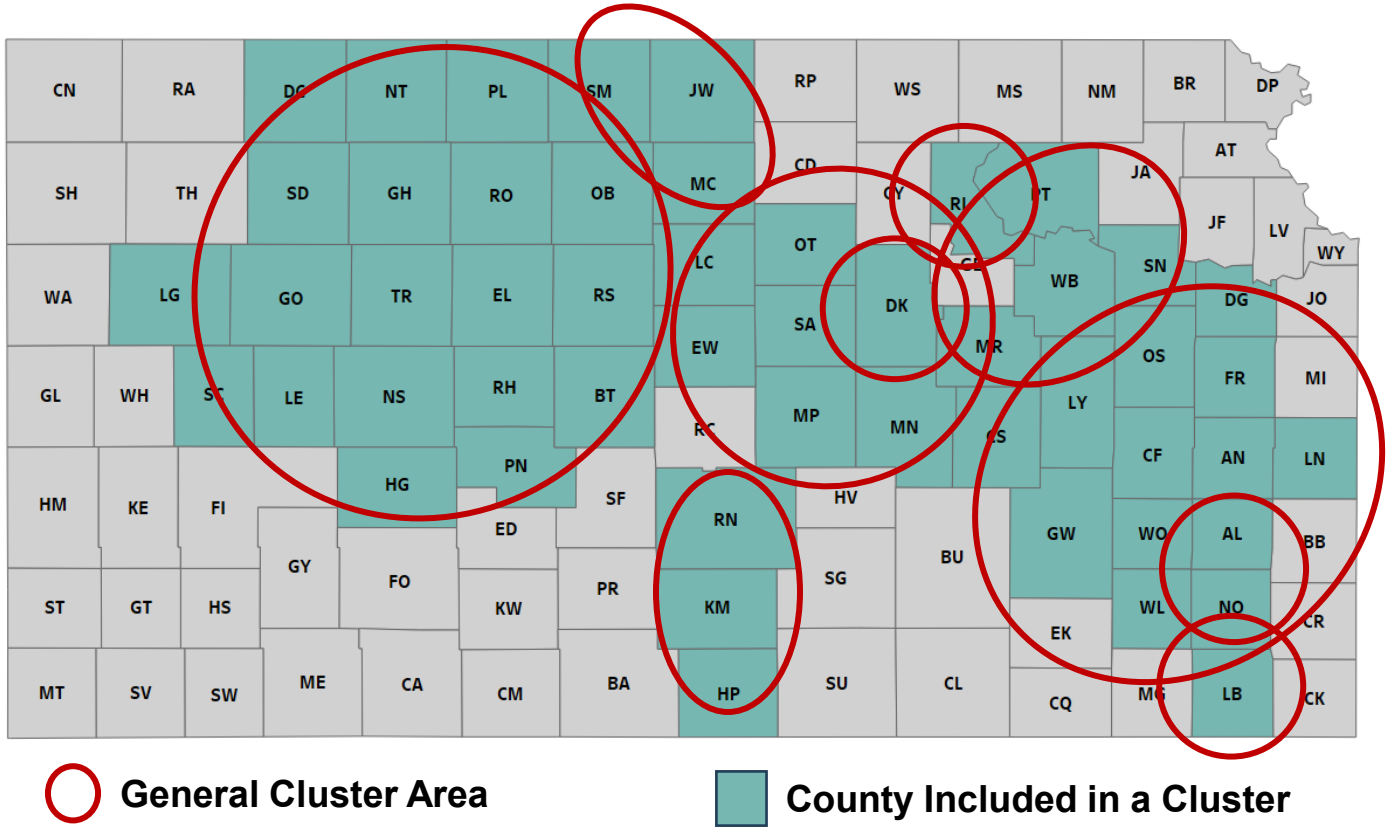


Non-Fatal Overdose Surveillance – Anomaly Detection

Goal: *To inform overdose prevention partners of changing trends in their jurisdictions to enable them to make informed decisions regarding response.*

- Weekly analysis for unusual increases in suspected overdose emergency department visits.
- Analysis looks at visits by data source, age group, and drug type.
- 10 clusters observed from April to November, 2025.

Clusters Identified From April to November 2025



Non-Fatal Overdose Surveillance – Anomaly Reports

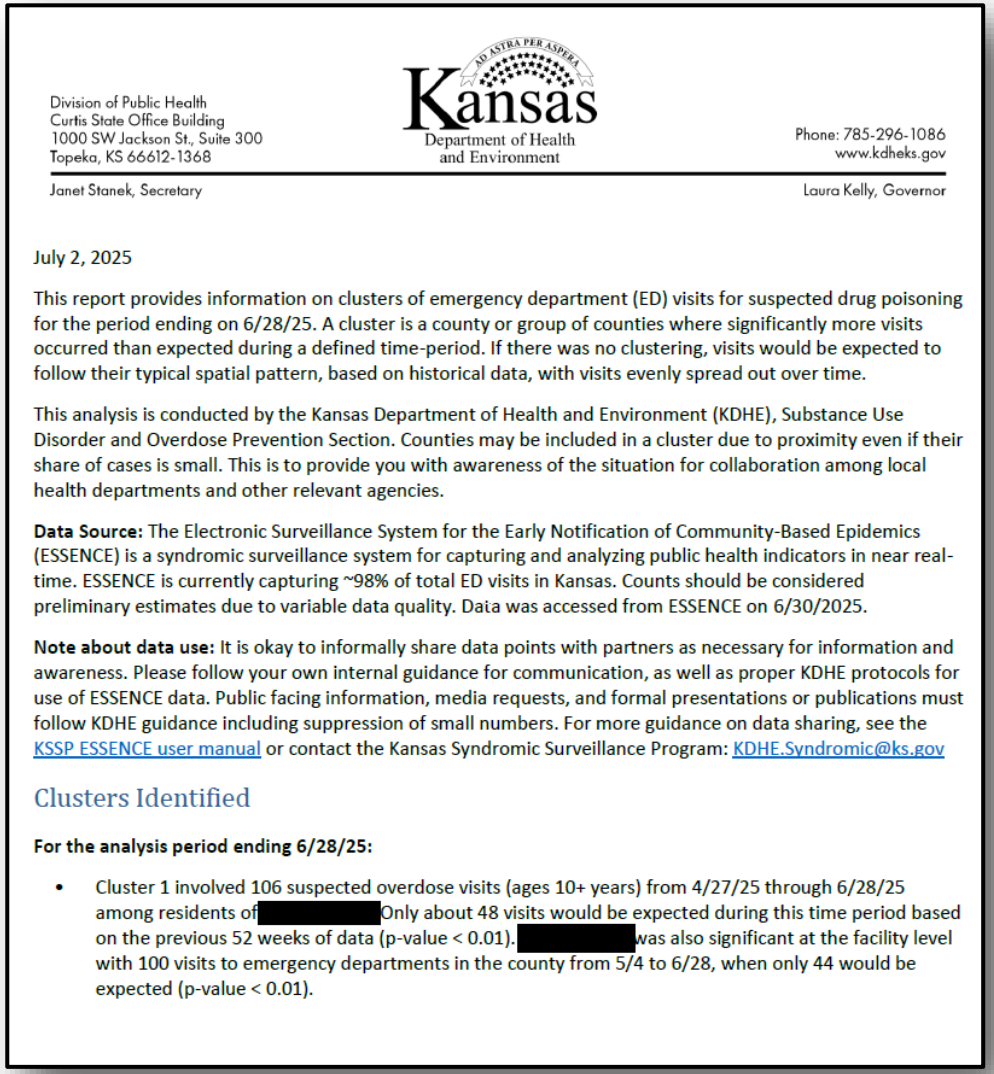
Alerting Overdose Prevention Partners

Reports are disseminated by email to:

- Local health departments, treatment providers, and other partners.

Reports include:

- Cluster summary
- County map
- Visit locations / resident locations
- Visit info
- Cluster timeline
- Resources



Division of Public Health
Curtis State Office Building
1000 SW Jackson St., Suite 300
Topeka, KS 66612-1368

Kansas
Department of Health and Environment

Phone: 785-296-1086
www.kdheks.gov

Janet Stanek, Secretary

Laura Kelly, Governor

July 2, 2025

This report provides information on clusters of emergency department (ED) visits for suspected drug poisoning for the period ending on 6/28/25. A cluster is a county or group of counties where significantly more visits occurred than expected during a defined time-period. If there was no clustering, visits would be expected to follow their typical spatial pattern, based on historical data, with visits evenly spread out over time.

This analysis is conducted by the Kansas Department of Health and Environment (KDHE), Substance Use Disorder and Overdose Prevention Section. Counties may be included in a cluster due to proximity even if their share of cases is small. This is to provide you with awareness of the situation for collaboration among local health departments and other relevant agencies.

Data Source: The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE) is a syndromic surveillance system for capturing and analyzing public health indicators in near real-time. ESSENCE is currently capturing ~98% of total ED visits in Kansas. Counts should be considered preliminary estimates due to variable data quality. Data was accessed from ESSENCE on 6/30/2025.

Note about data use: It is okay to informally share data points with partners as necessary for information and awareness. Please follow your own internal guidance for communication, as well as proper KDHE protocols for use of ESSENCE data. Public facing information, media requests, and formal presentations or publications must follow KDHE guidance including suppression of small numbers. For more guidance on data sharing, see the KSSP ESSENCE user manual or contact the Kansas Syndromic Surveillance Program: KDHE.Syndromic@ks.gov

Clusters Identified

For the analysis period ending 6/28/25:

- Cluster 1 involved 106 suspected overdose visits (ages 10+ years) from 4/27/25 through 6/28/25 among residents of [redacted] Only about 48 visits would be expected during this time period based on the previous 52 weeks of data (p-value < 0.01). [redacted] was also significant at the facility level with 100 visits to emergency departments in the county from 5/4 to 6/28, when only 44 would be expected (p-value < 0.01).

Non-Fatal Overdose Surveillance – Example Cluster

Example Cluster Summary:

Date Range: 4/27/25 – 6/28/25 (9 weeks)

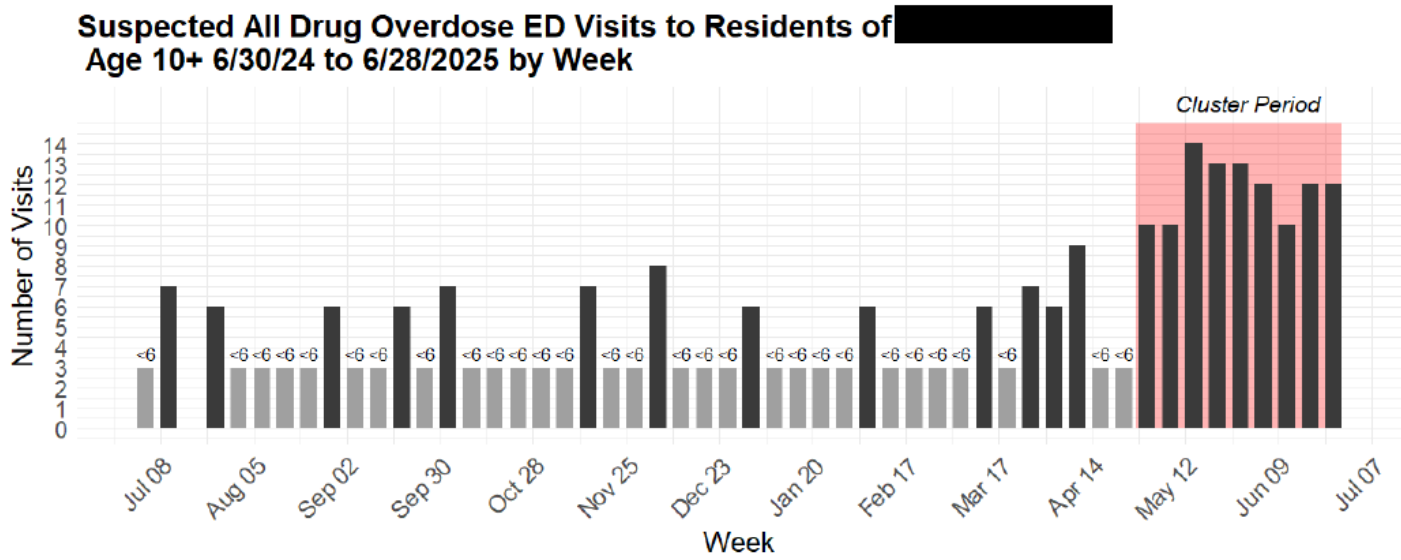
Number of ED Visits: 106

Expected Number of ED Visits: 48

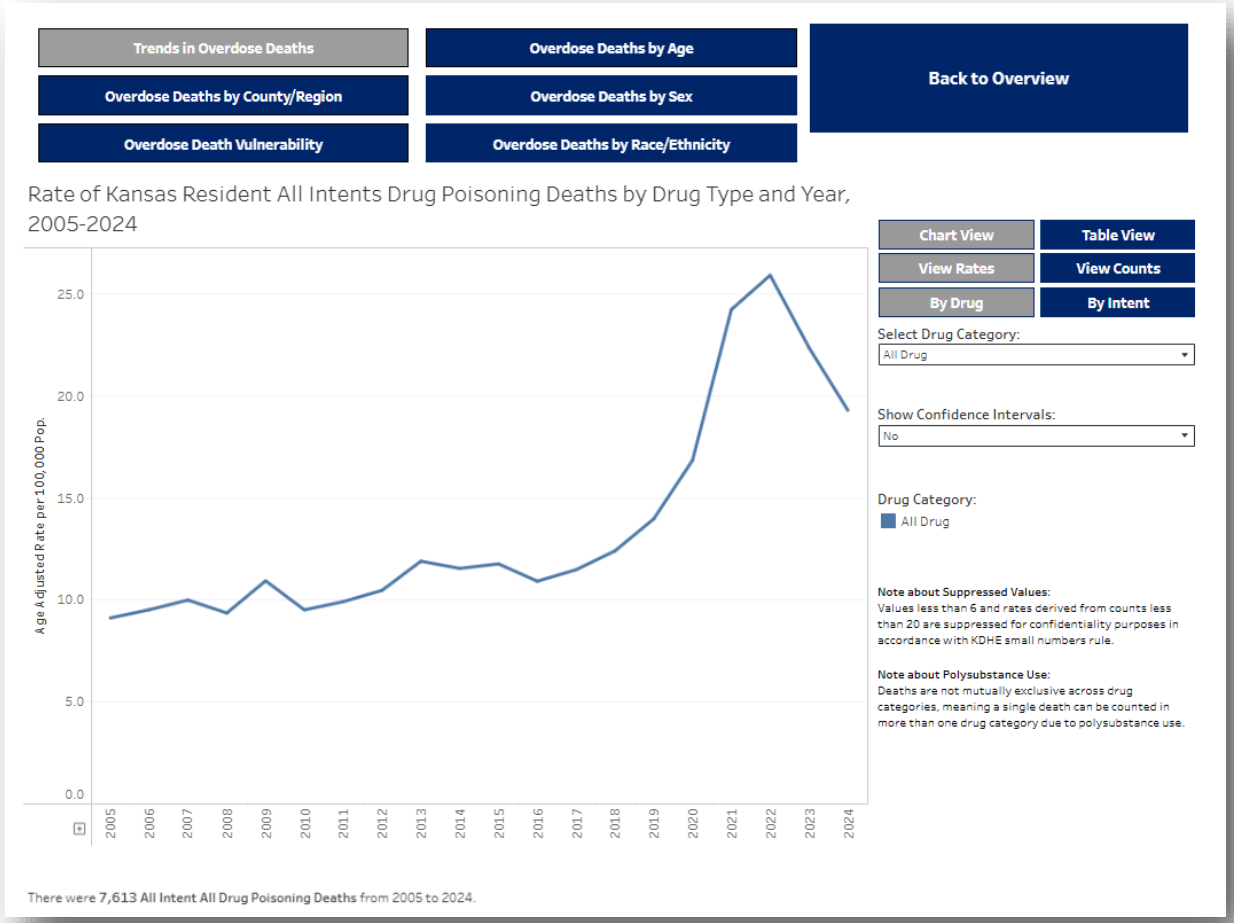
Type: Suspected Any Drug Overdose

Visits Identified by: Patient Residence

Age-group: 10+ years



Dashboard and Toolkit



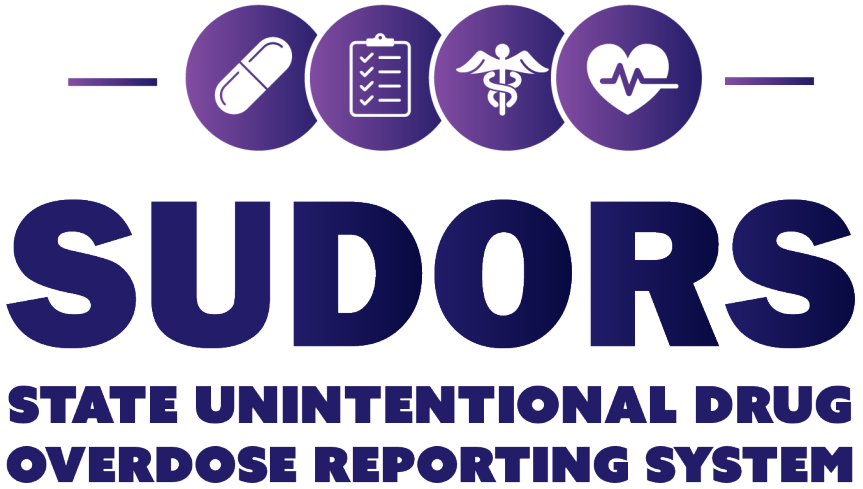
Strategy 3: Fatal Overdose Surveillance

Deaths from Q3 2019 to Q4 2024.

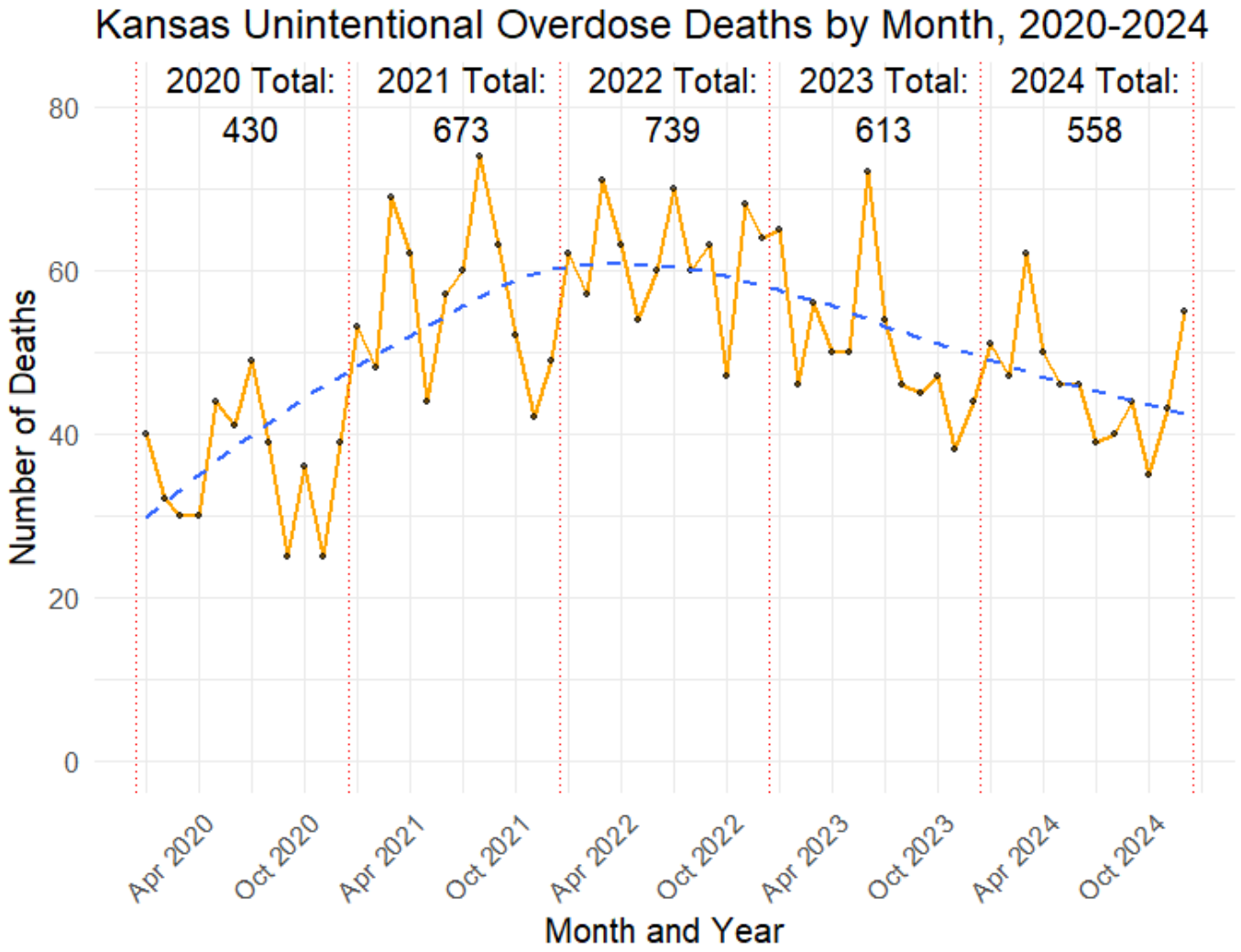
Over 600 data elements:

- Cause and manner of death
- Location
- Circumstances
- Toxicology results
- Demographics

Data is included on national CDC dashboard and various KDHE data products.



Snapshot of Fatal Overdose in Kansas

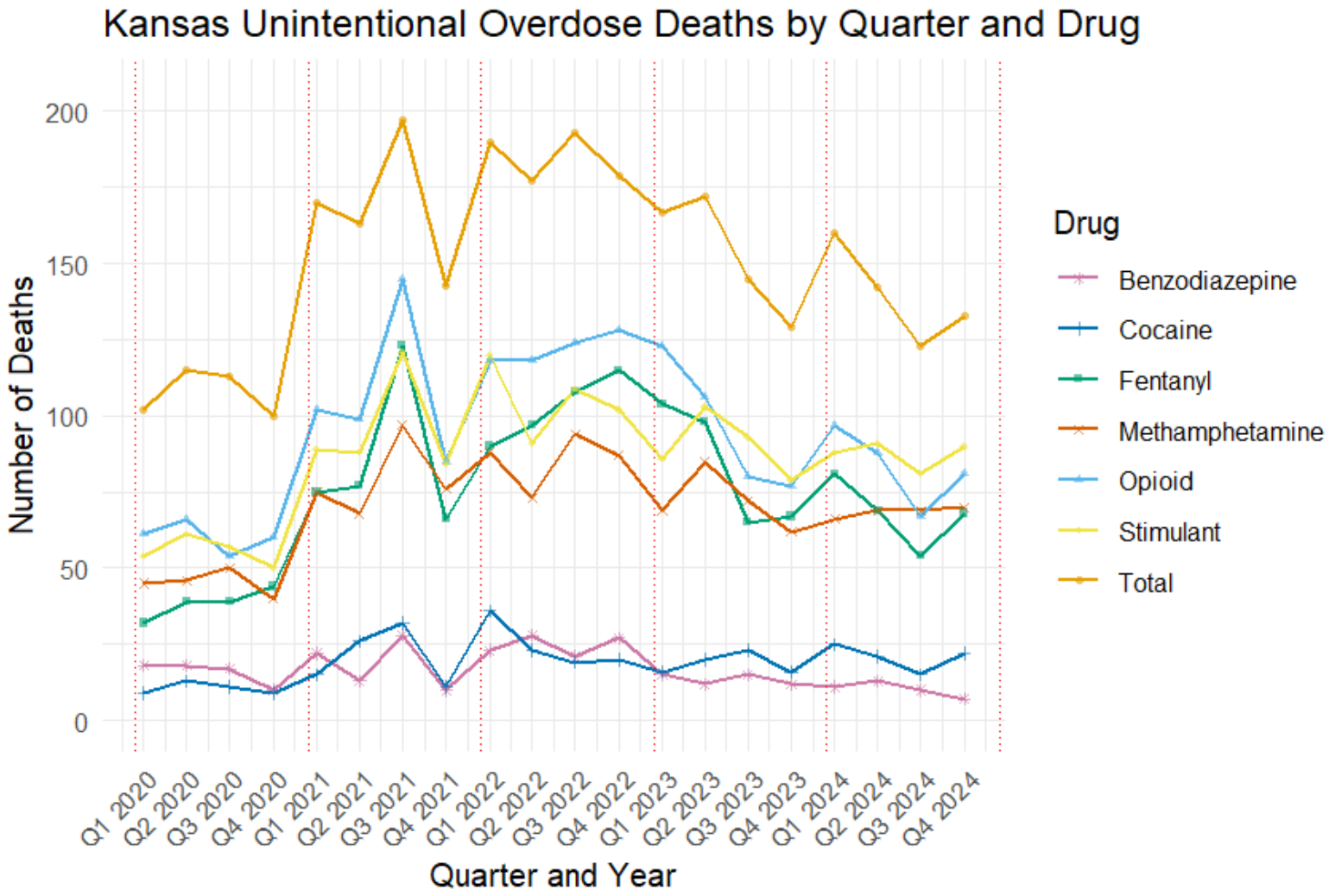


2024 Overdose Age and Sex Demographics

Sex	Percent
Male ▲	67%
Female	33%
Age Group	**Count (Rate)**
20-24	33 (14.9)
25-34	104 (27.0)
35-44	118 (30.7)
45-54 ▲	125 (37.6)
55-64	103 (30.1)
65-74	50 (16.2)

▲ - Indicates group with highest burden

Trends in Drug Involvement Over Time



Trends in Drug Involvement Over Time – 2023 to 2024

All Drug:

▼ Down 9% from 613 to 558.

Opioid:

▼ Down 14% from 386 to 333.

Fentanyl:

▼ Down 19% from 334 to 272.

Heroin:

▲ Up 25% from 8 to 10.

Stimulant:

▼ Down 3% from 361 to 350.

Methamphetamine:

▼ Down 5% from 288 to 274.

Cocaine:

▲ Up 11% from 75 to 83.

Benzodiazepine:

▼ Down 24% from 54 to 41.

Deaths Involving Other Drugs of Interest

Xylazine

- Identified as a cause of death (COD) in 10 Kansas deaths from 2020 to 2024.

Kratom/7-OH/Mitragynine

- Identified as a COD in 79 Kansas deaths from 2020 to 2024.

Medetomidine

- Not identified as a COD in any Kansas deaths from 2020 to 2024.

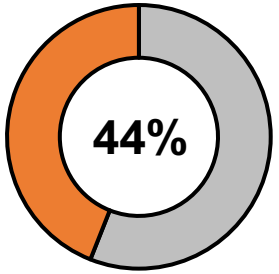
Carfentanil

- Identified as a COD in 0 deaths from 2020 to 2023, and 12 deaths in 2024.

Polysubstance Use

Fentanyl COD + Meth COD: 119 deaths in 2024

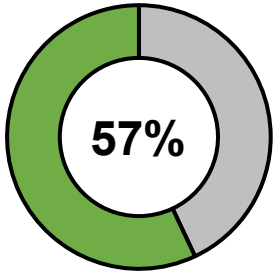
(44% of the 274 fentanyl involved deaths included meth).



Kratom/Mitragynine COD + Fentanyl COD:

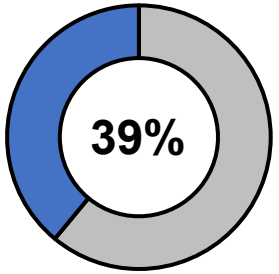
45 deaths from 2020-2024

(57% of the 79 kratom involved deaths included fentanyl).



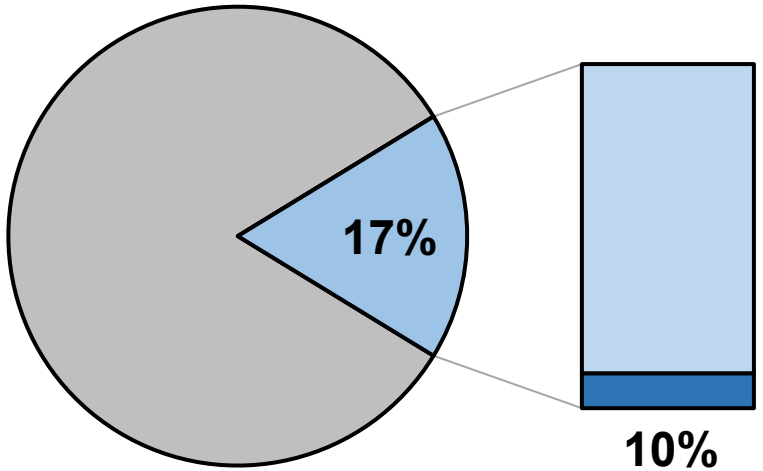
Cocaine COD + Fentanyl COD: 32 deaths in 2024

(39% of the 83 cocaine involved deaths included fentanyl).



Circumstantial Evidence in Fatal Overdose: 2020 - 2024

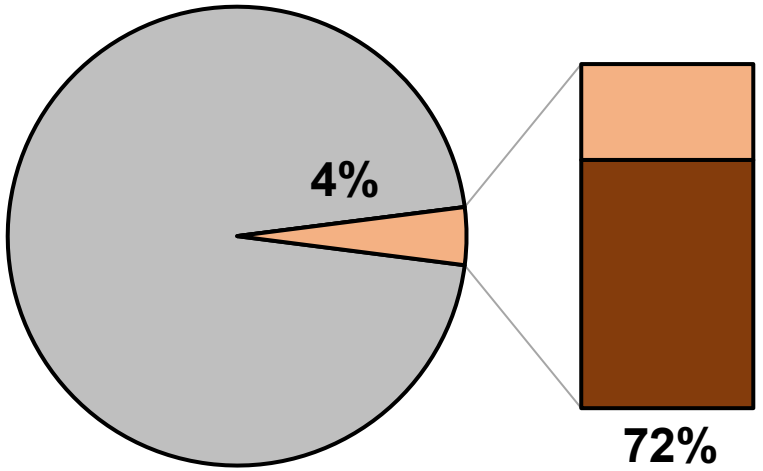
17% Had Evidence of a Mental Health Problem



53 had ever received treatment.

526 Deaths

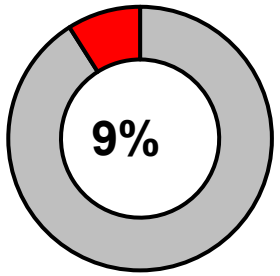
4% Had a Witness to the Fatal Drug Use



88 of these deaths involved opioids.

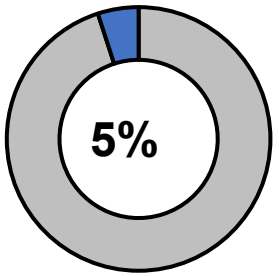
122 Deaths

9% Had Known Alcohol Problems



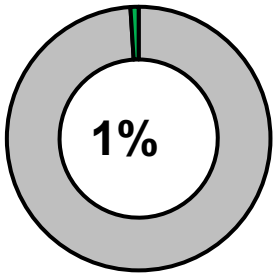
284 Deaths

5% Had Evidence of a Prior Overdose



142 Deaths

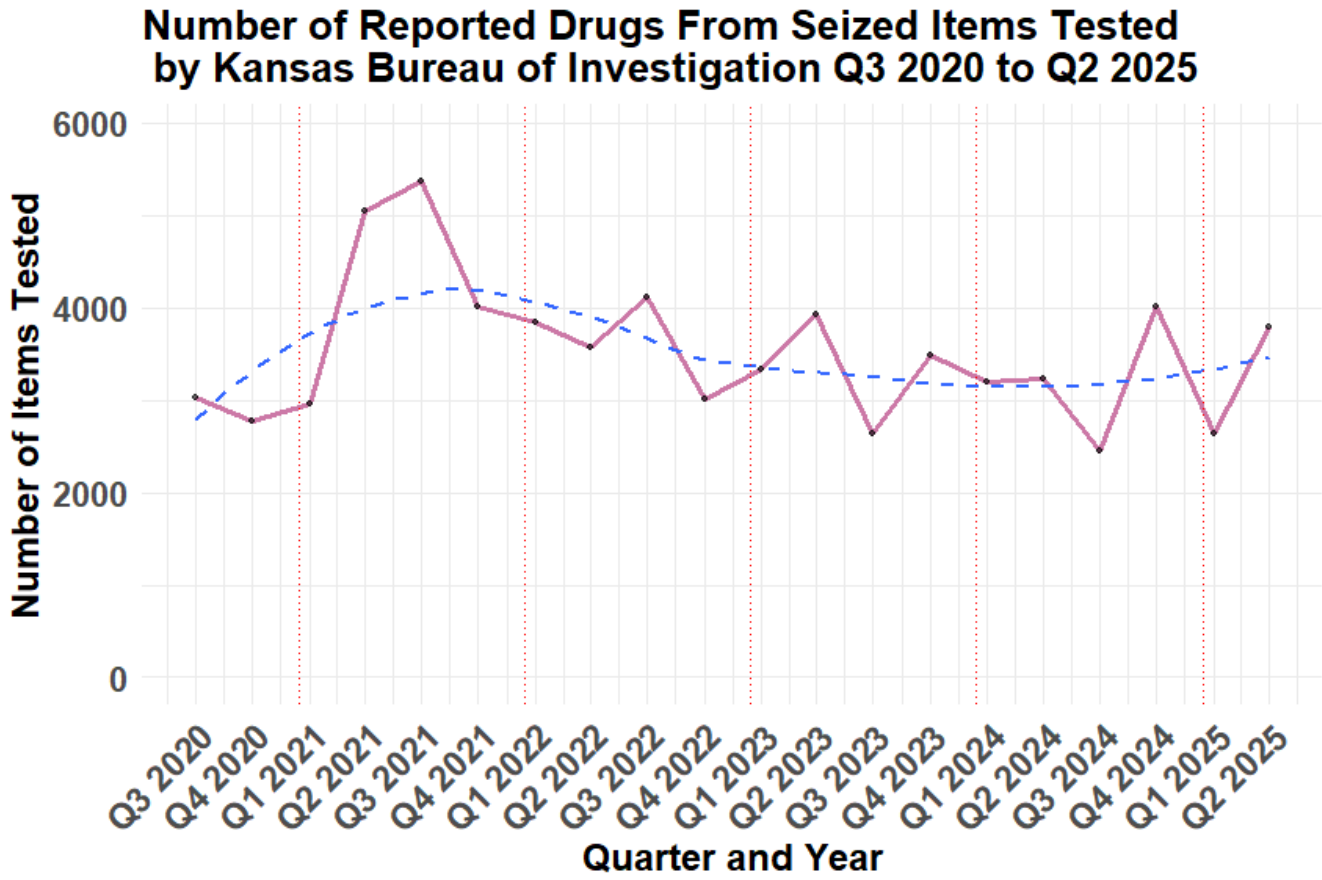
1% Were Recently Released from Jail or Prison



42 Deaths

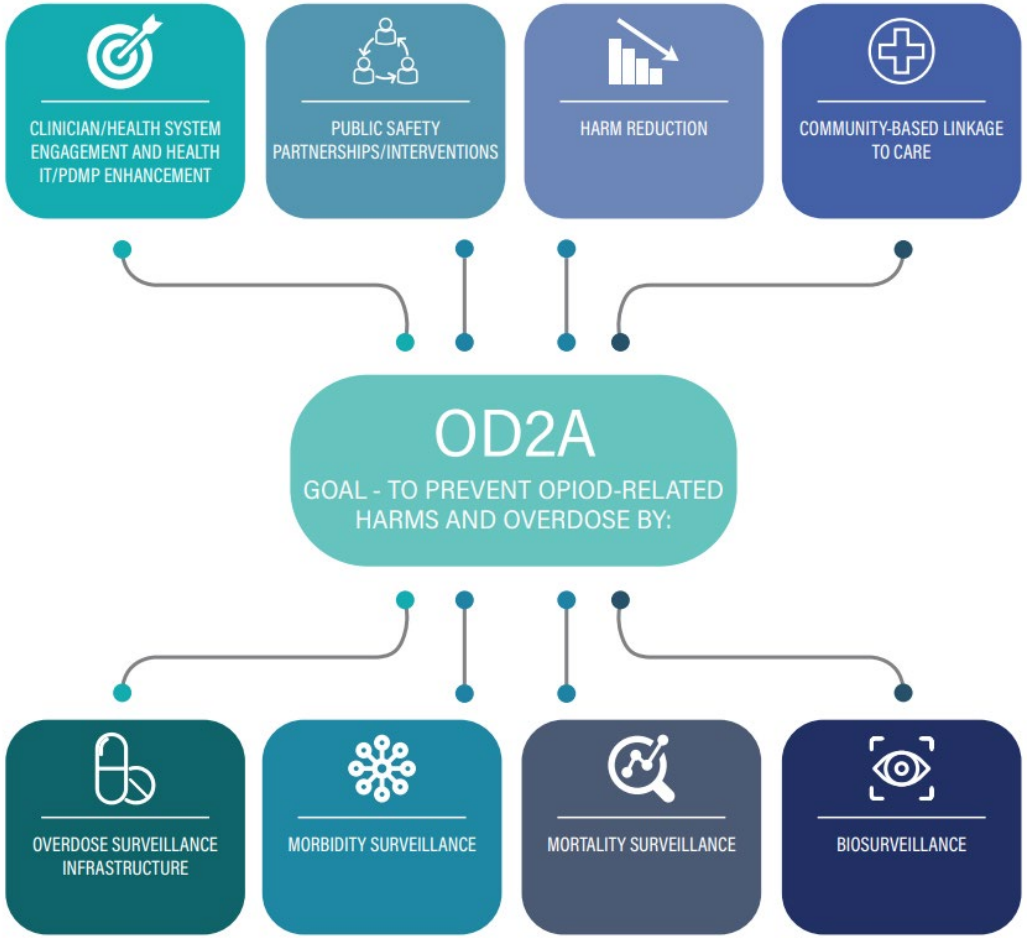
Other Strategies: Public Safety Partnerships

- The KBI tests seized drugs submitted from local law enforcement.
- Provides insight into what drugs are present in Kansas.
- Steady level of testing since 2022.
- Limitations of the data
    - No significant associations with fatal or non-fatal overdose identified by county.



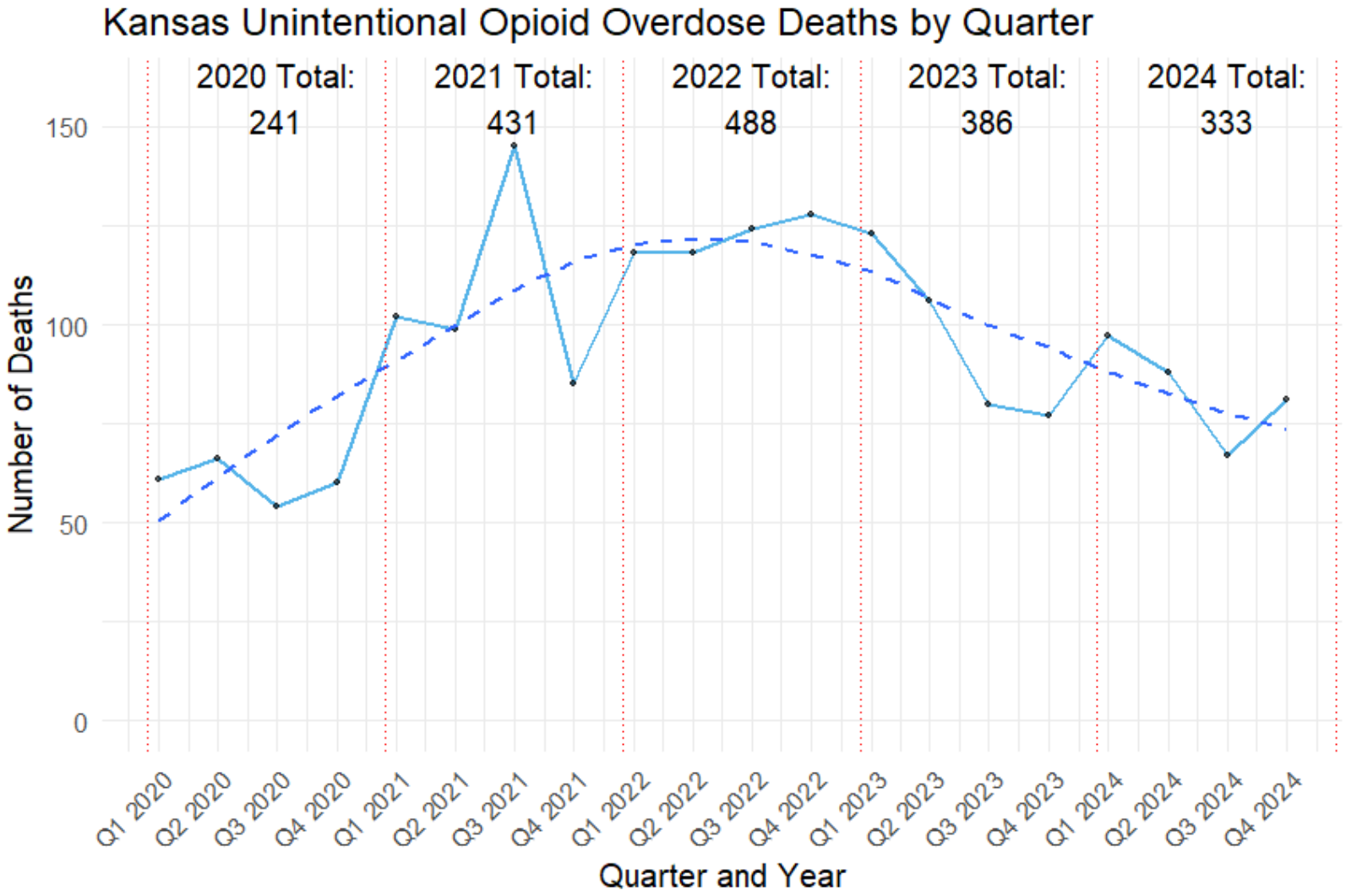
Prevention: Data to Action

- Targeted media campaigns.
- Peer navigators in high-burden hospitals.
- Providing data to jurisdictions experiencing unusual increases.
- Naloxone training.
- Law enforcement training.
- Learning collaborative for prescribers.

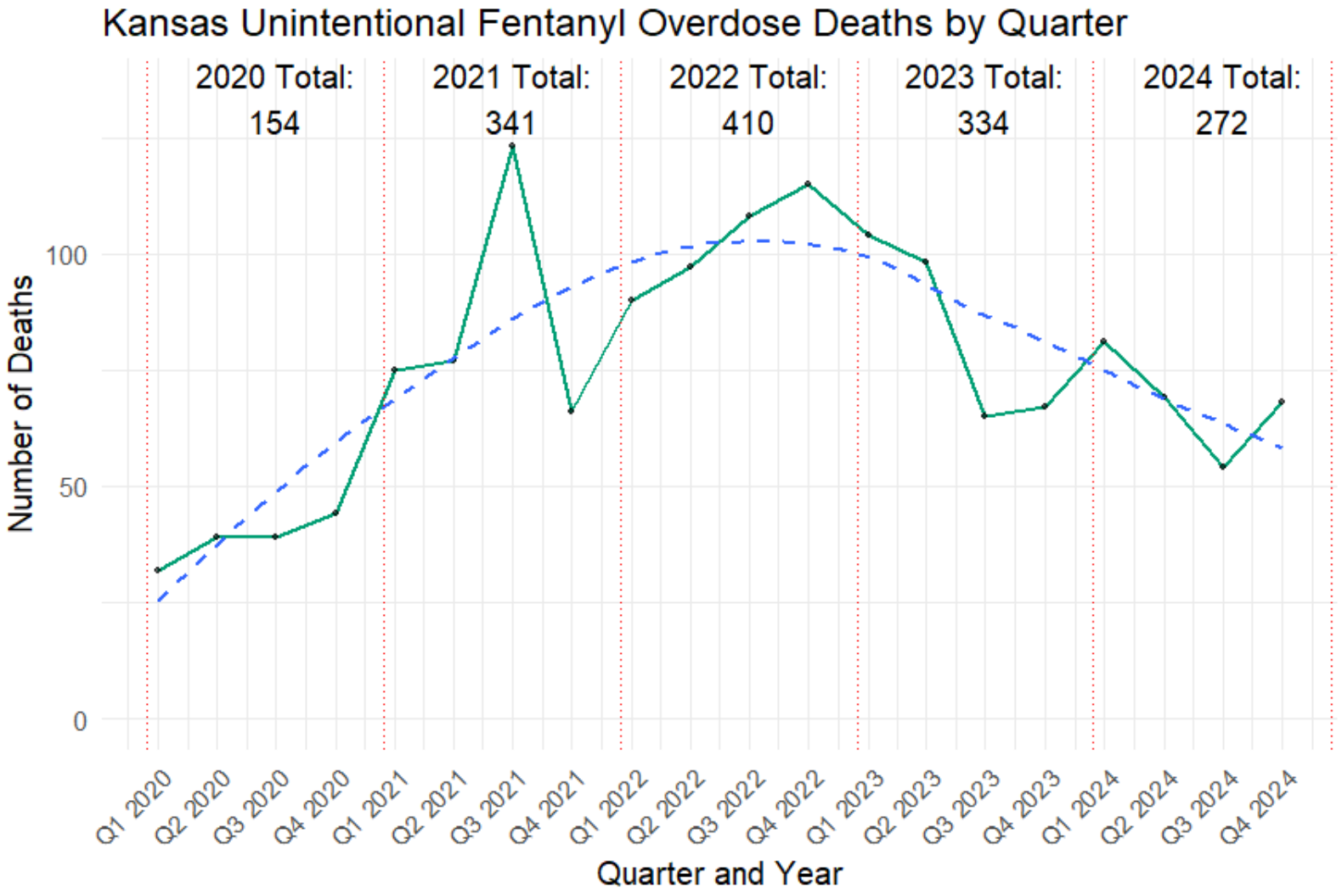


Scott Johnston, MPH
Epidemiologist
Substance Use Disorder and Overdose Prevention Program
Bureau of Epidemiology and Public Health Informatics
(785) 207-4248
Scott.Johnston@ks.gov

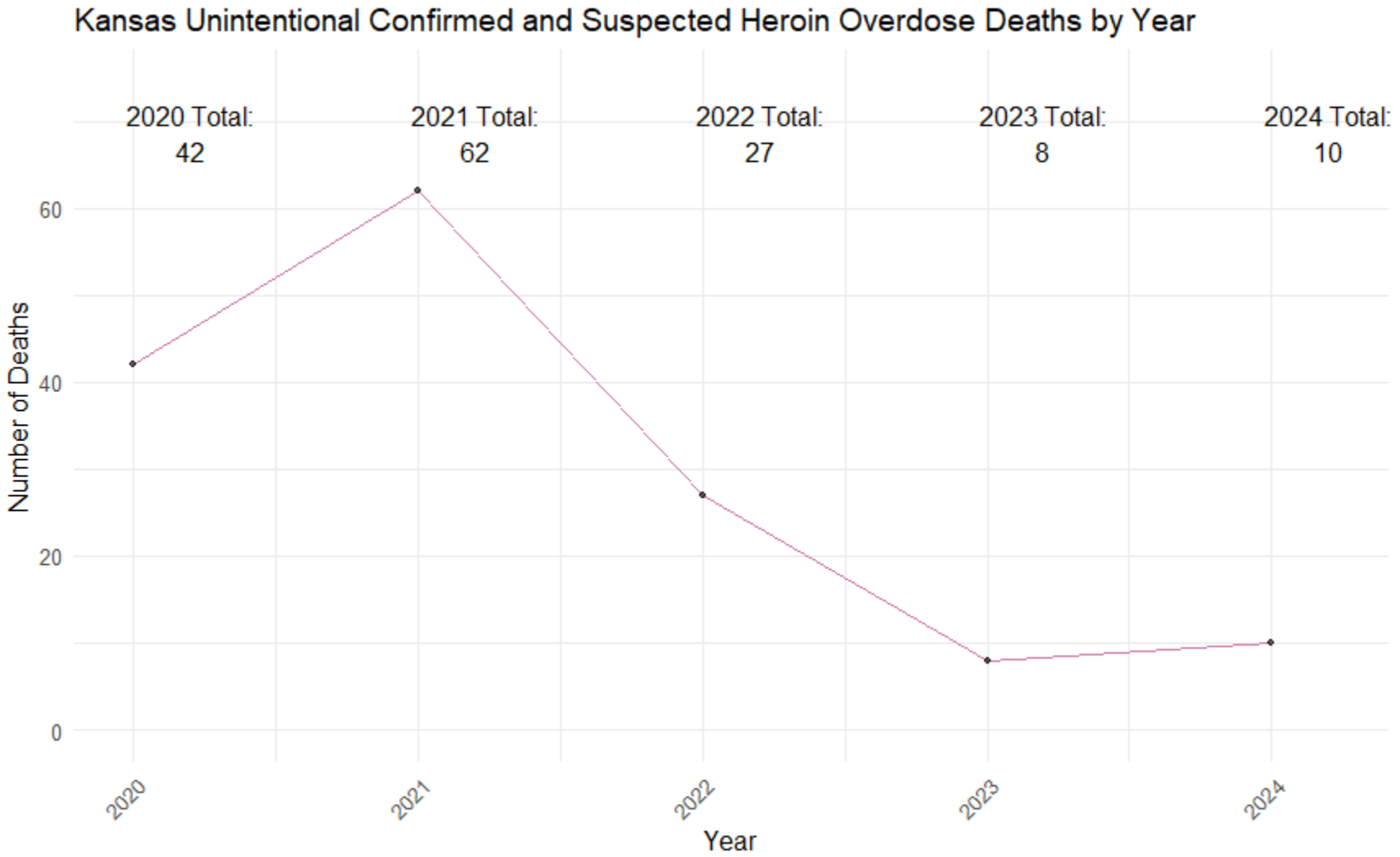
SUDORS – Opioid Trends



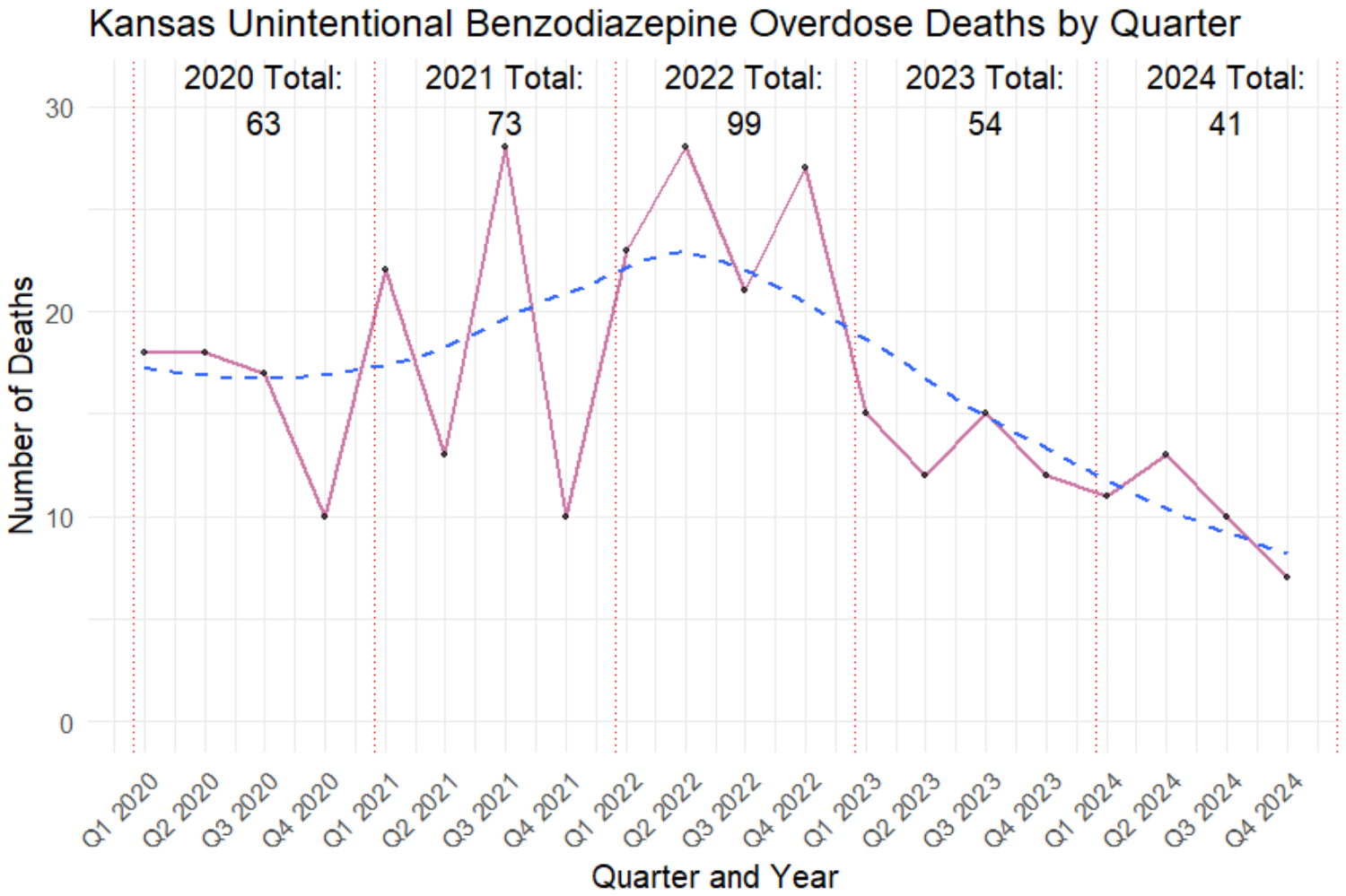
SUDORS – Fentanyl Trends



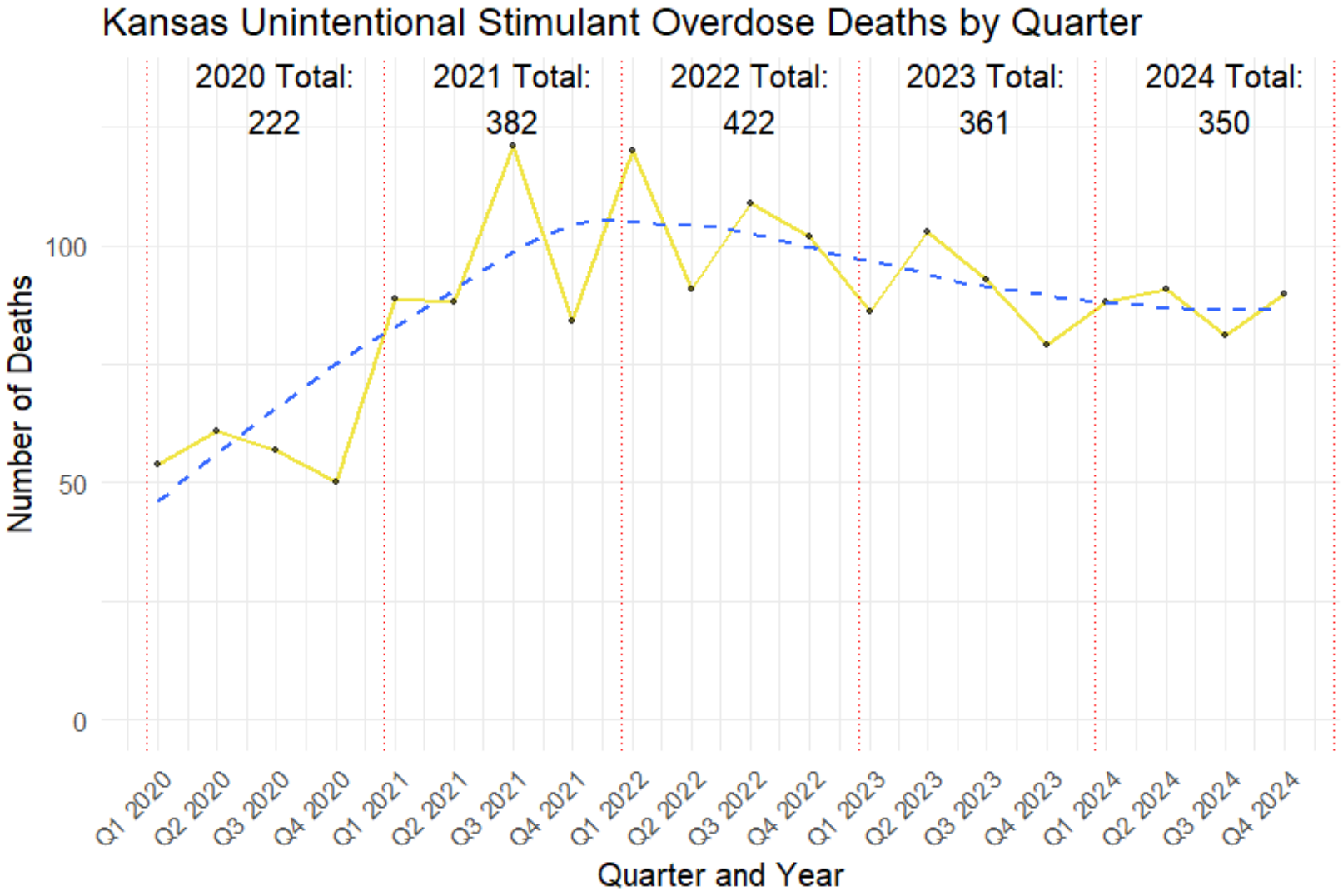
SUDORS – Heroin Trends



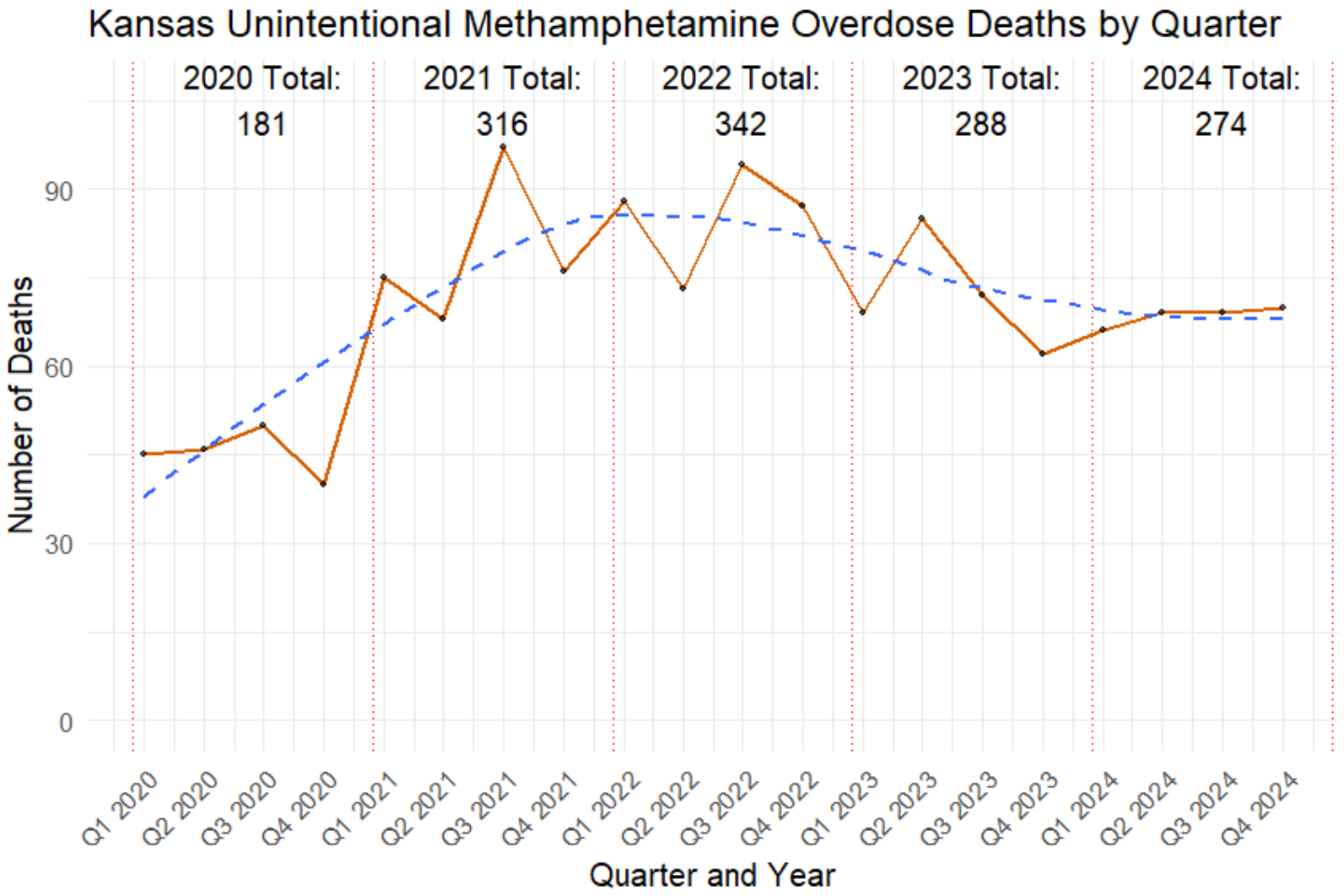
SUDORS – Benzodiazepine Trends



SUDORS – Stimulant Trends



SUDORS – Methamphetamine Trends



SUDORS – Cocaine Trends