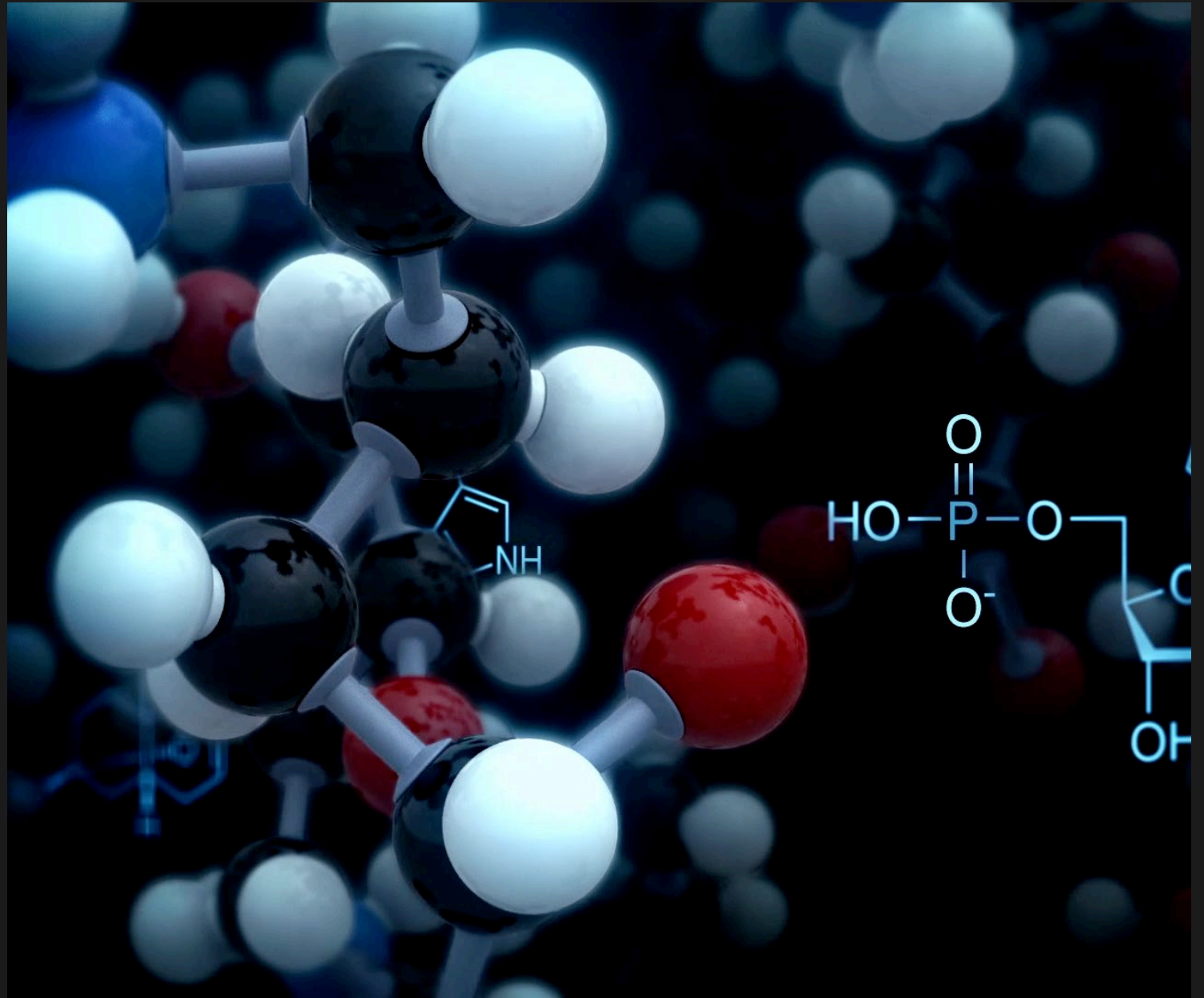


# Current Drug Trends

Amy Miles  
Wisconsin  
State Lab of  
Hygiene





# What drugs are currently trending?

How do you track them?

# National Resource For Drug Trends



- DEA NFLIS
- Center for Forensic Science Research and Education (CFSRE)
- National Drug Early Warning System (NDEWS)
- Local Crime Labs

# CDC OVERDOSE TO ACTION

The screenshot shows the CDC website's 'Drug Overdose' section. At the top left is the CDC logo and the text 'Centers for Disease Control and Prevention' with the tagline 'CDC 24/7: Saving Lives. Protecting People™'. A search bar is located at the top right. Below the search bar is a purple header with the text 'Drug Overdose'. A breadcrumb trail reads 'CDC > Injury Center > Drug Overdose > Data Dashboards & Alerts > Nonfatal Overdose Dashboards'. On the left side, there is a navigation menu with a home icon and the text 'Drug Overdose', followed by links for 'Drug Basics', 'Understanding Drug Overdoses and Deaths', 'Overdose Prevention', 'Extramural Funded Research', and 'Data Briefs'. The main content area features the title 'DOSE Dashboard: Nonfatal Overdose Syndromic Surveillance Data' with a 'Print' link below it. A red date stamp indicates the page was 'Updated August 24, 2023'. A blue information box contains a message: 'Monthly updates to the dashboard for nonfatal overdose syndromic surveillance data are temporarily on hold as we transition to the Overdose Data to Action in States cooperative agreement. Following the August 2023 dashboard update, monthly updates will not resume until March 2024. If you have any questions, please email [DOSE@cdc.gov](mailto:DOSE@cdc.gov).'

CDC Centers for Disease Control and Prevention  
CDC 24/7: Saving Lives. Protecting People™

Search

## Drug Overdose

CDC > Injury Center > Drug Overdose > Data Dashboards & Alerts > Nonfatal Overdose Dashboards

🏠 Drug Overdose

- Drug Basics
- Understanding Drug Overdoses and Deaths
- Overdose Prevention
- Extramural Funded Research +
- Data Briefs +

# DOSE Dashboard: Nonfatal Overdose Syndromic Surveillance Data

[Print](#)

Updated August 24, 2023

**i** Monthly updates to the dashboard for nonfatal overdose syndromic surveillance data are temporarily on hold as we transition to the Overdose Data to Action in States cooperative agreement. Following the August 2023 dashboard update, monthly updates will not resume until March 2024. If you have any questions, please email [DOSE@cdc.gov](mailto:DOSE@cdc.gov).



# NPDS INTERACTIVE DASHBOARD

Select a state or age group below to filter the data. Our interactive dashboard is not available on Internet Explorer. Please try again using a different web browser.




## 2022

DATA

### POISONING IS THE LEADING CAUSE OF INJURY DEATH IN THE U.S.

according to the National Center for Health Statistics

America's Poison Centers represents the 55 U.S. Poison Centers which manage exposure cases via telephone. People call a center when they think someone may have been in contact with something potentially harmful. They also call for information. The Poison Centers are managed by doctors, nurses, and pharmacists who have specialized training in poisoning prevention and treatment.

In 2022, U.S. Poison Centers responded to:

- 2,064,875 human exposures cases
- Across 65 states and territories
- Resulting on average, a case every 15 seconds
- 24% were reported from a Health Care Facility (490,868 cases)

#### HOT TOPICS hover for details

- 8,579 Fentanyl Exposures
- 3,358 Delta-8 THC Exposures
- 130 Minor Cannabinoids Exposures

#### WHAT TYPES OF SUBSTANCES WERE PEOPLE EXPOSED TO? (TOP 5)

hover for information

Analgesics	<b>11.5%</b>
Cleaning Substances (Household)	<b>7.2%</b>
Antidepressants	<b>5.6%</b>
Cosmetics/Personal Care Products	<b>5.2%</b>

#### FIND YOUR STATE TO EXPLORE THE DATA

select state to filter | unselect to return to national data



# Most Common Drug Trend in the US



# TOP 10 TRENDING DRUGS - 2022

METHAMPHETAMINE

FLUOROFENTANYL

COCAINE

4-ANPP

THC

OXYCODONE

FENTANYL

ALPRAZOLAM

HEROIN

BUPRENORPHINE

# CLOSING IN ON THE TOP 10

PSILOCIN/PSILOCYBIN

XYLAZINE

PCP

215 MEADOWVIEW LN, Sparta, WI 54656-1207 US

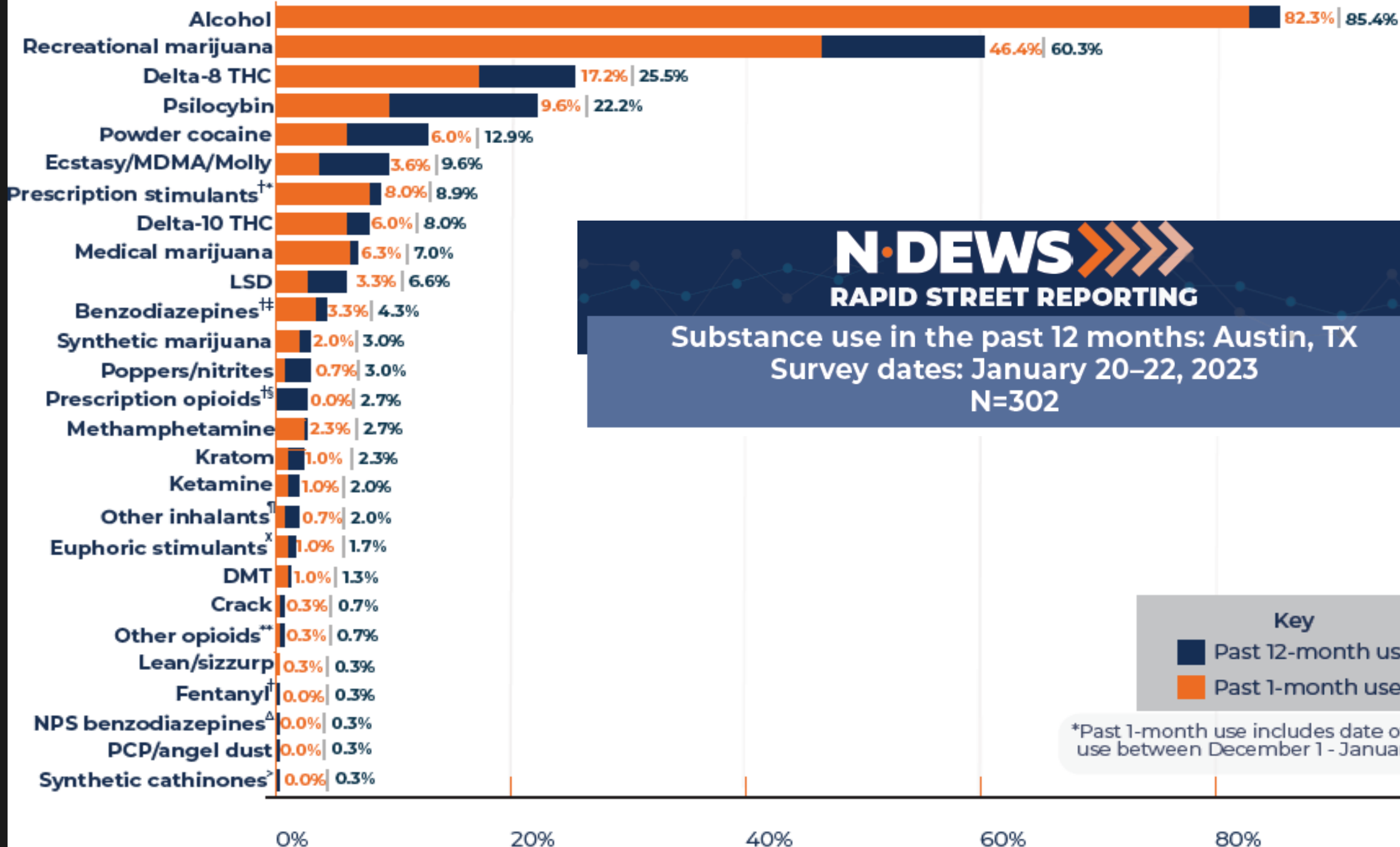
SYNTHETIC BENZOS

- CLONAZOLAM
- BROMAZOLAM
- ETIZOLAM

KETAMINE

SYNTHETIC CANNABINOIDS





**N·DEWS**   
**RAPID STREET REPORTING**  
 Substance use in the past 12 months: Austin, TX  
 Survey dates: January 20–22, 2023  
 N=302

**Key**

-  Past 12-month use
-  Past 1-month use

\*Past 1-month use includes date of last use between December 1 - January 22

0% 20% 40% 60% 80%  
 Percent (%)



# CNS STIMULANTS

# CNS STIMULANTS

## METHAMPHETAMINE

- Often found with fentanyl
- “New” speedball
- Stimulant used to avoid dopesick

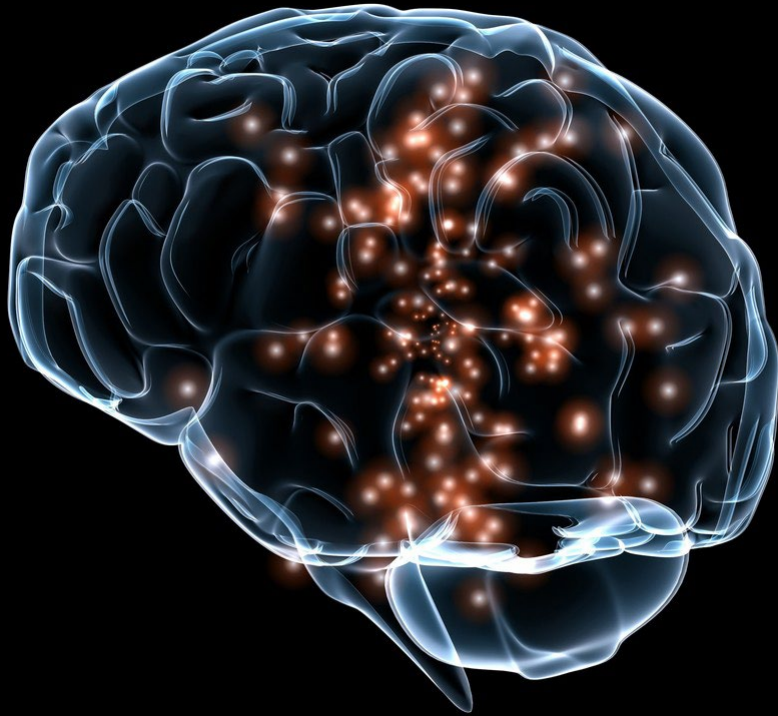
## COCAINE

- Cut with variety of drugs such as levamisole
- Trends vary across the US

## SYN CATHINONES

- “Bath Salts”
- Less common in drug trends
- Unpredictable

# CNS Stimulants – Common Signs of Impairment



Increased pulse and BP

Slowed reaction to light for pupils

- Pupil dilation

Overall lack of coordination and balance

Slurred speech

Fidgeting, restlessness, agitation

Increased risk taking

Withdrawal / Downside





# CANNABINOIDS



# CANNABINOIDS CHALLENGES



---

Illegal, but common  
everywhere

---

Education regarding  
impairment

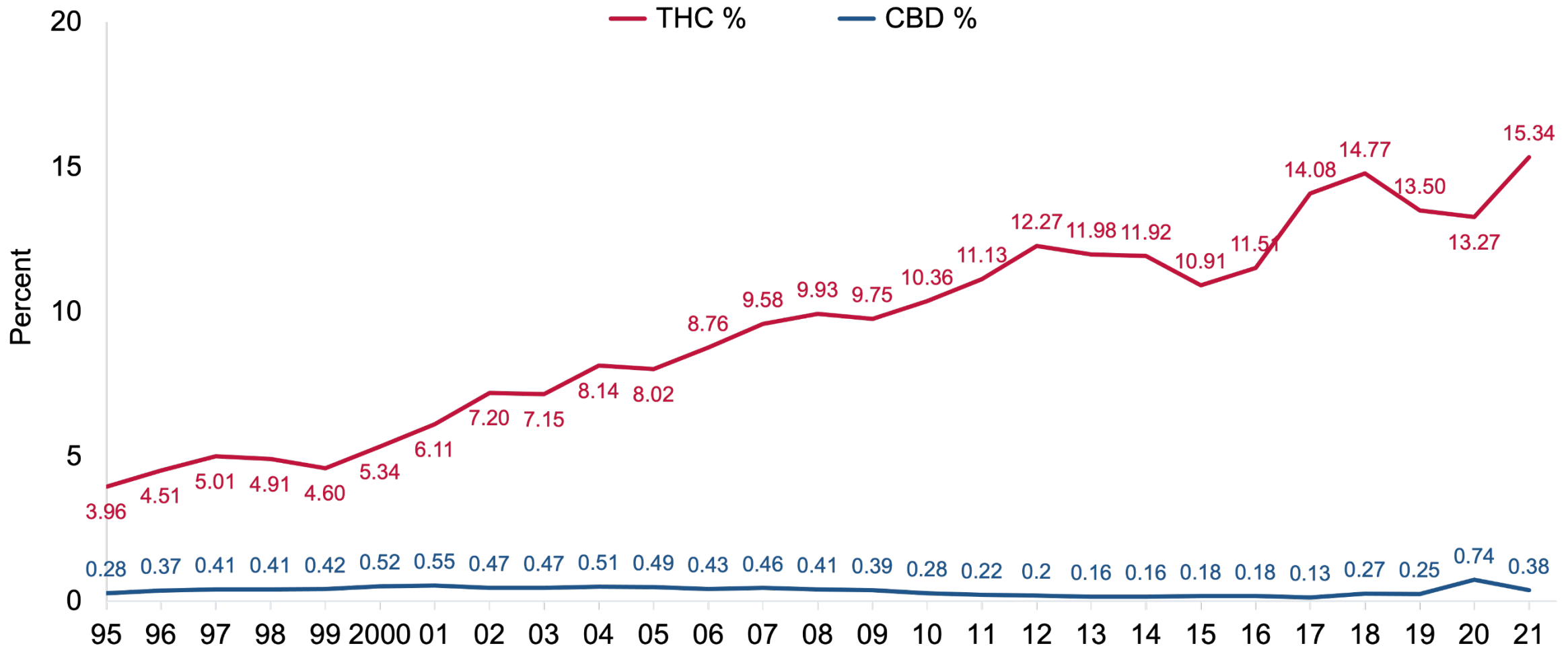
---

Synthetic cannabinoids

---

CBD, Hemp, THC isomers  
and derivatives

# Percentage of THC and CBD in Cannabis Samples Seized by the DEA, 1995-2021





# THC – THREE MAJOR COMPOUNDS

## Delta-9 (parent)

- Psychoactive component
- Very short half-life

## 11-Hydroxy

- Equipotent to D9 at certain concentrations
- Very short half-life

## Carboxy-THC

- Inactive metabolite
- Common for urine testing

# CBD and Hemp are not THC

Legal CBD and Hemp products are to contain less than 0.3% of THC

Truly legal products will not create a detectable amount of delta-9-THC in blood



Law enforcement field test kits

Do not distinguish between CBD and  
THC

Laboratory testing required



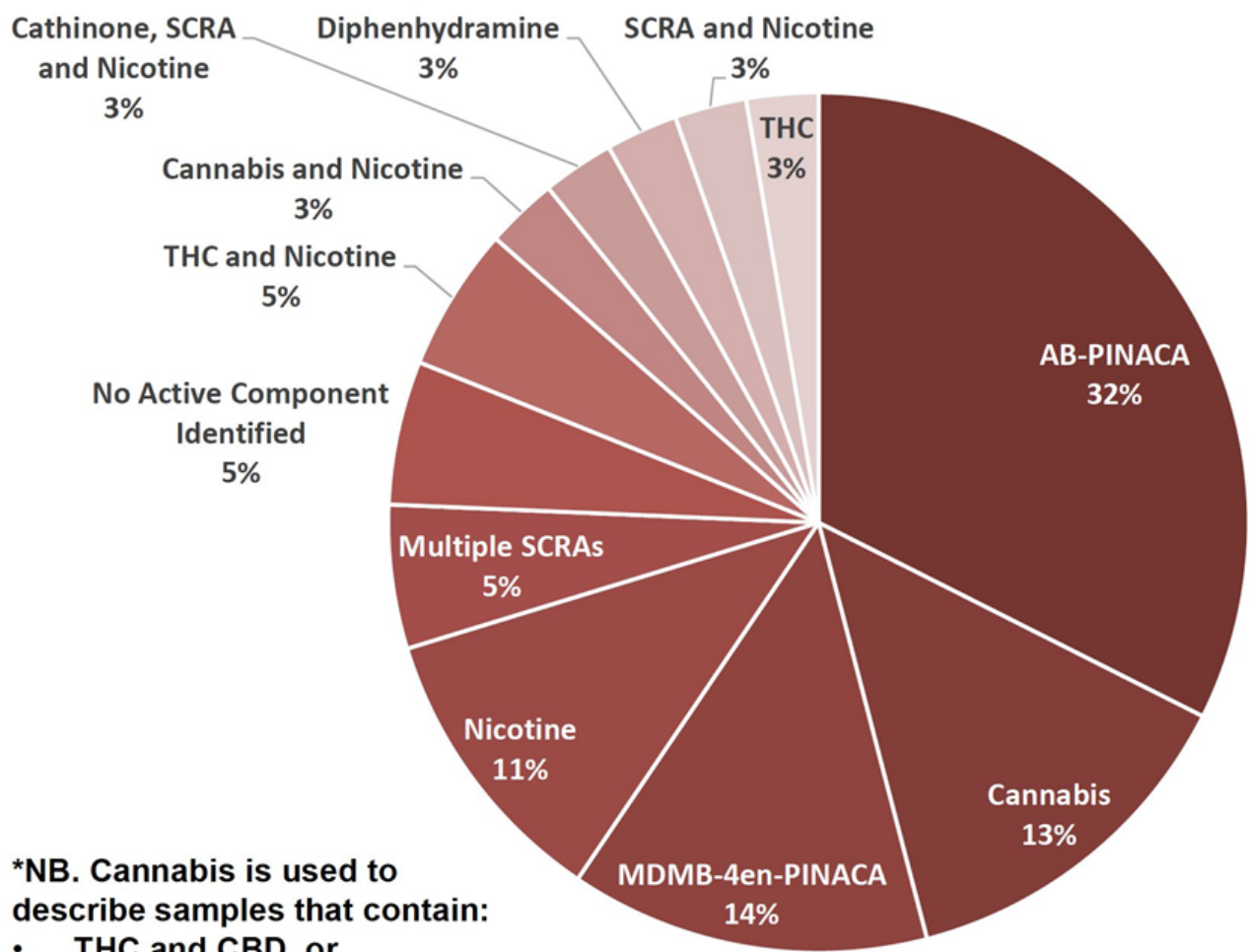
Zero regulation/oversight of products

# “Legal” Products



- Product risk
  - Unknown side effects with concomitant drugs
  - Claims of product QA and testing
  - Other drugs likely present in product
  - Concentration of THC varies

# THC E-Liquid submissions February 2021



37 samples submitted as THC E-Liquids

Age range of sample providers: 16 to 40 years

Median age of sample providers: 25yrs

**\*NB. Cannabis is used to describe samples that contain:**

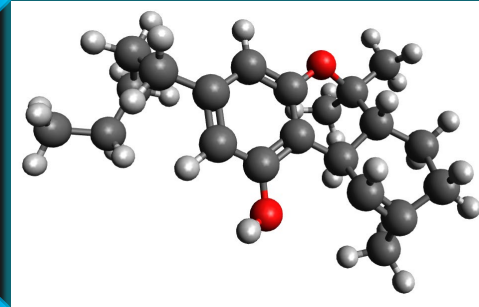
- THC and CBD, or
- THC and CBN, or
- THC, CBD and CBN



# THC Isomers

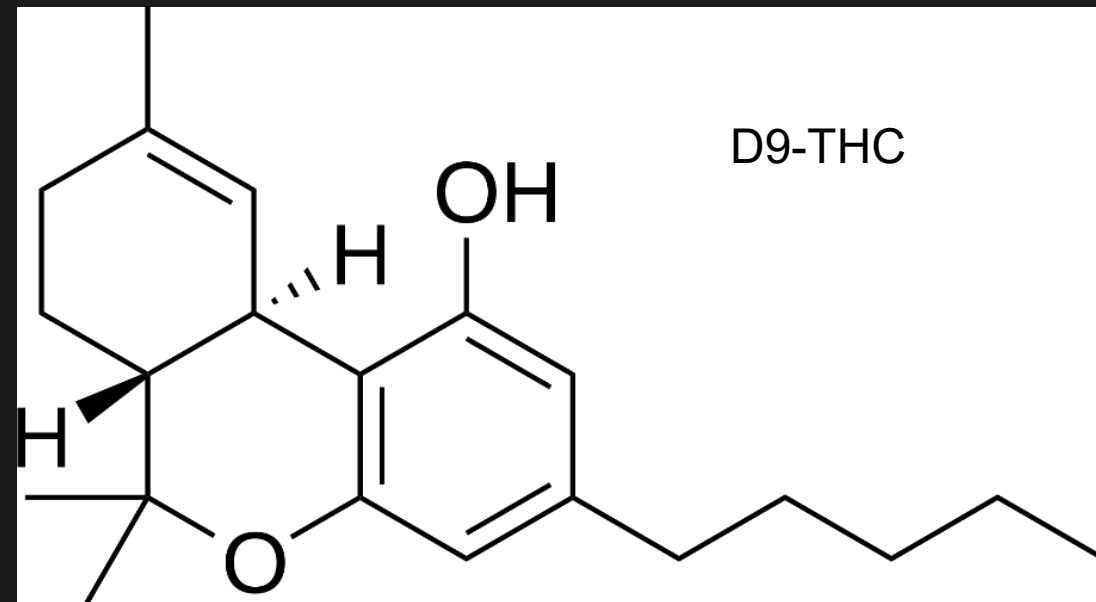
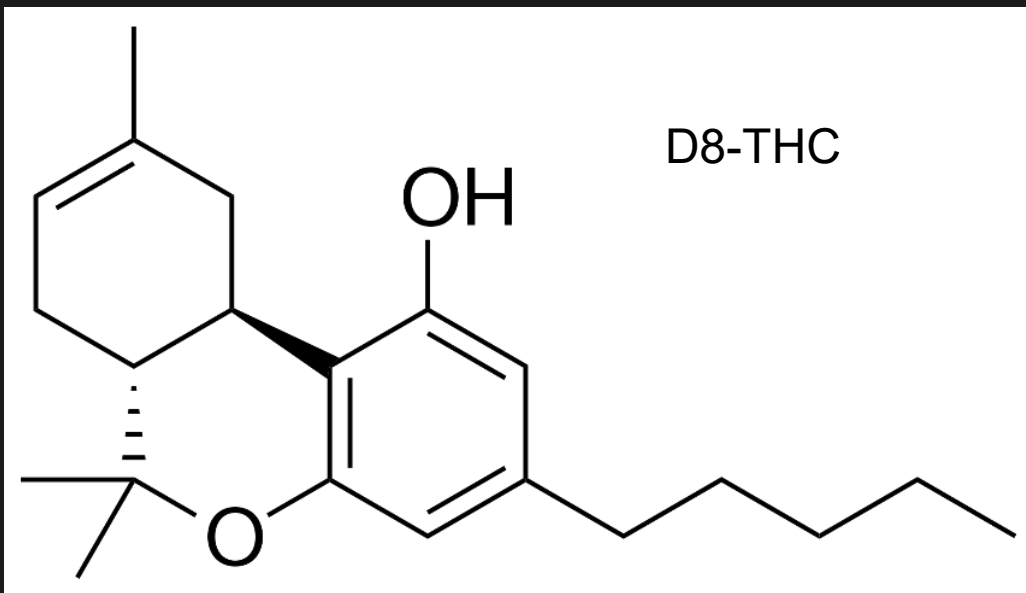
Delta - 7

Delta - 8



Delta - 10

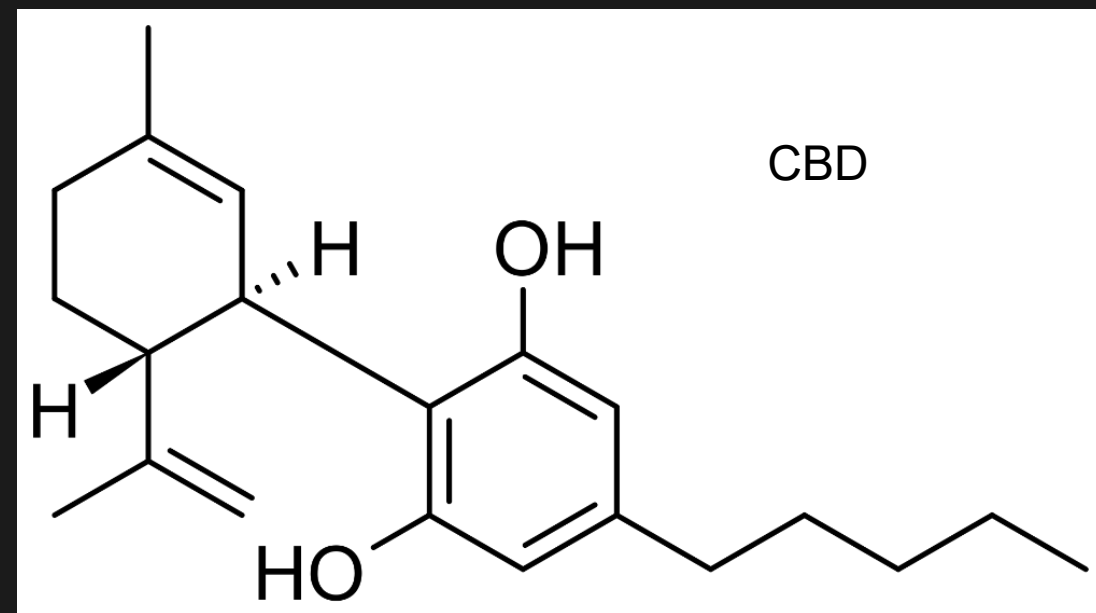
?



Similar chemical  
structures

D8 less potent than D9

CBD has no potency



# Synthesis of Delta-8-THC From CBD



**Catalyze CBD with Acid:** 1 gram of CBD in 10 mL 0.005 molar sulfuric acid in glacial acetic acid

**Neutralize/Remove Acid and Solvent:** 100 mL water + 15 grams sodium bicarbonate; Petrol ether extraction, H<sub>2</sub>O wash, evaporate solvent

**Purify Final Product:** Chromatograph on silica gel with 1 to 2% ether in petrol ether for purification

**Test for purity**

3 hrs @ RT = 52% D9 and 2% D8

3 days @ RT = 15% D9, 54% D8, 10% D8-iso, and 10% CBD

# Unconscious man in the drive thru



February 2021 at 1420 hours

Slow response to questions

THC Vape smoking device in center console

Admission of vaping while driving, tried something new

Pupils dilated

Breath, chemical odor

MRB:

- Eye lid tremors
- Internal clock, confused and disoriented (15 sec/30 sec) “one and a half hours”



# Unconscious man in the drive thru



LOC = Present

Pupil Size Dilated

Pulses/BP Elevated

Confusion and disorientation

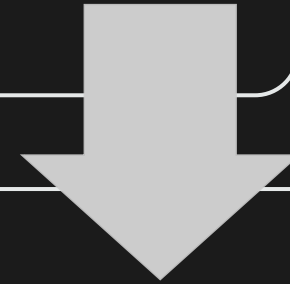
- Thought he was in Green Bay, actually FDL
- Asked, do you know where you are? “Southwest”
- I wanted a burger

Tried Something new

- Ask for vapes behind the counter
- THC illegal in Wisconsin
  - “Farm bill passed”
  - “Depends upon definition of drugs”

# Toxicology Testing


No drugs detected



Unidentified compound in  
THC test

- Later determined to be Delta-8-THC

# Long History with Synthetic Cannabinoids

- Research chemicals since the late '70's early '80's
- Recreational use began around 2008
- Evolution of administration
  - Sprayed plant material
  - “Soaked” plant material
  - Powder  e-liquids

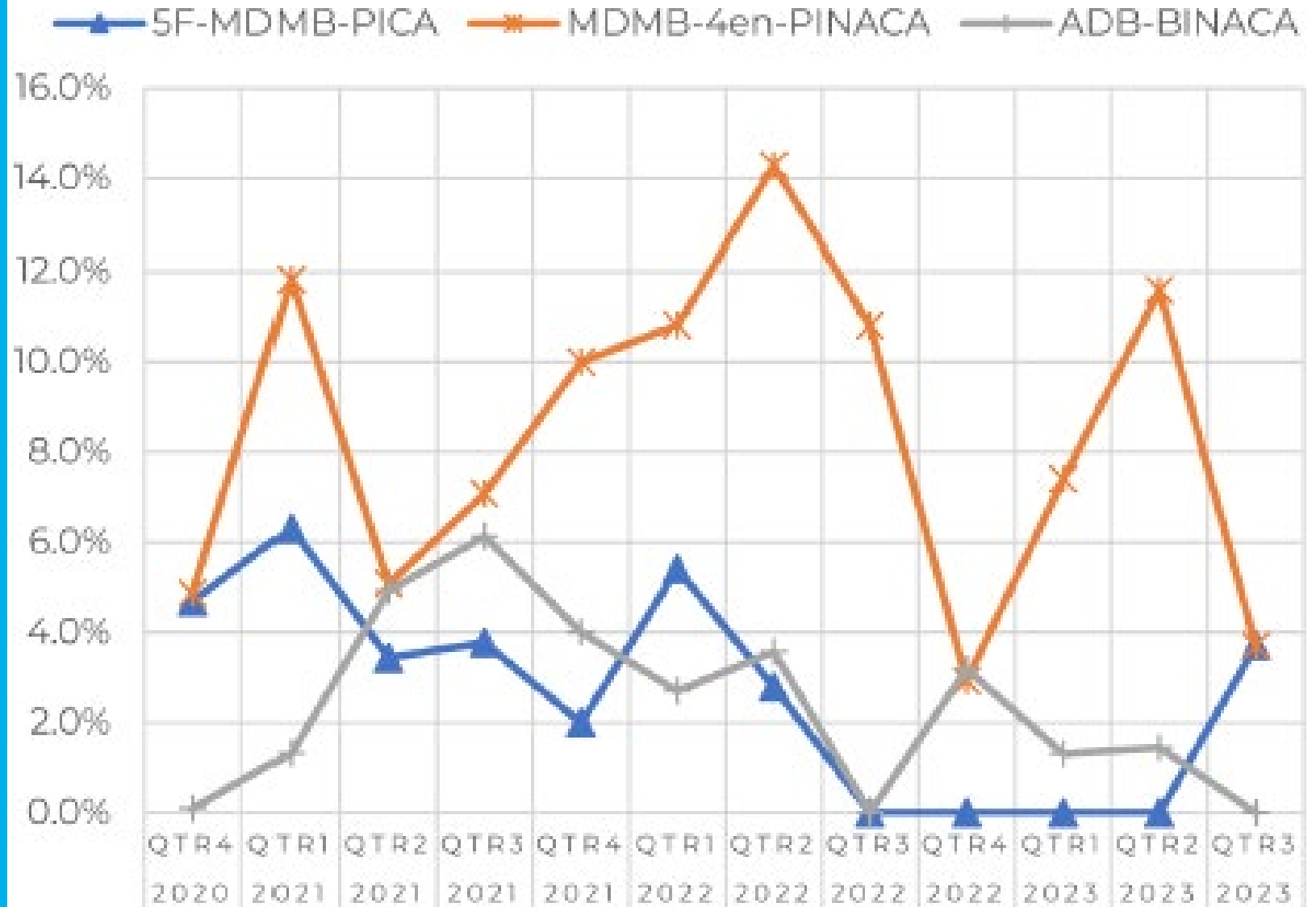


# CFSRE SYN CANNS IN THE US

## Q4 2023 TREND REPORT

### SELECT POSITIVITY: Q4 2020 to Q3 2023

Positivity plot does not include Q4 2023 due to low volume and positivity in toxicology samples.





# Case Histories

# Two-timer

---

Driving to Burger King with kids in the car

---

Admitted to purchasing the drug from a local gas station, not illegal

---

Felt the effects of the drug “as soon as he started smoking...”

---

Claims first time use of synthetic cannabinoids



# Two-timer

---

During DRE contact, subject would suddenly wake up, begin to shake, appear to be having paranoia and anxiety

---

Subject would look straight ahead, clench fists and tighten muscles in arms and legs

---

Constant mood swings

HGN	PRESENT	<b>NONE</b>
VGN	PRESENT	<b>NONE</b>
Lack of convergence	PRESENT	<b>PRESENT</b>
Pupil size	RL: 5.5, DRK: 4.0, DL: 4.0	<b>DILATED*</b>
Reaction to light	NORMAL	<b>NORMAL</b>
Pulse	94, 94, 99	<b>UP</b>
Blood Pressure	149 / 99	<b>UP</b>
Body Temp	98.1	<b>NORMAL</b>
Muscle Tone	NEAR NORMAL	<b>NORMAL</b>

# Two-timer

---

Unable to complete SFSTs, subject in a hospital bed

---

Slow, slurred speech

---

Slow coordination

---

DRE opinion – unable to operate a motor vehicle safely, under the influence of cannabis

# Two-timer

---

Blood sample sent to WSLH, comprehensive drug testing – no drugs detected

---

Outsourced for synthetic cannabinoids testing

---

AB-CHMINACA: 9.4 ng/mL

## Two-timer, Pt. 2

APRIL, 2016

---

Sunday, 4:28 pm, Officers dispatched to a disable vehicle in a busy roadway

---

Vehicle was stopped in the middle of the highway

---

Subject was screaming unintelligible statements, appeared to “be in a state of excited delirium”







## Two-timer, Pt. 2

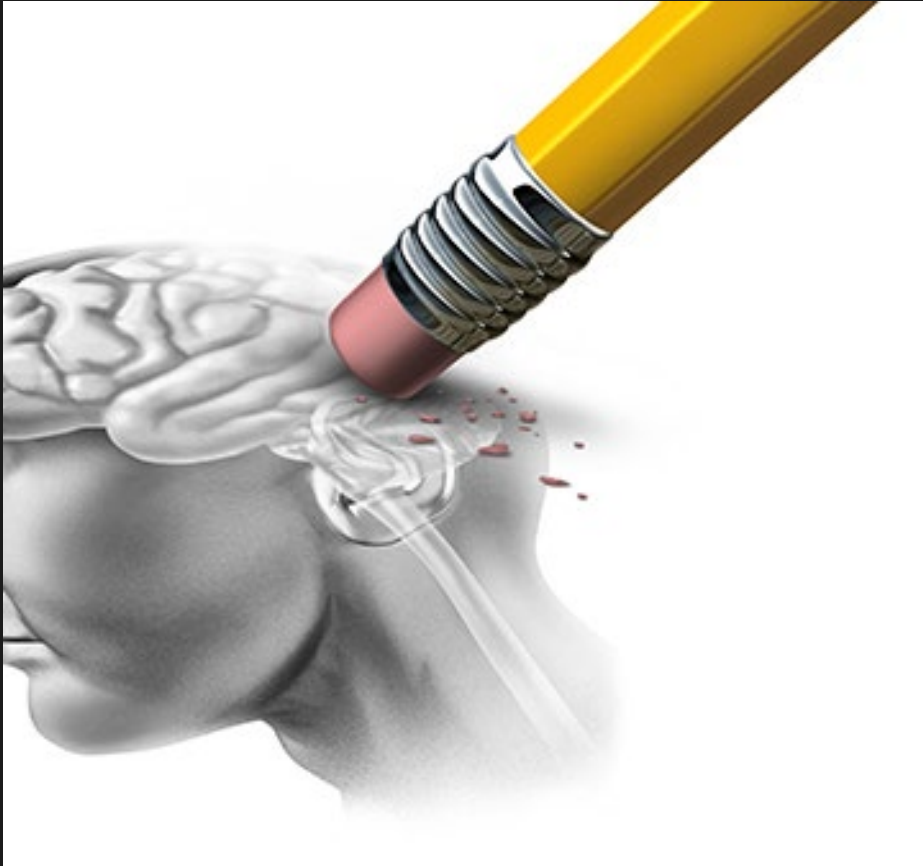


Due to combative behavior, subject was administered ketamine

Retrieved synthetic cannabinoid product from the vehicle

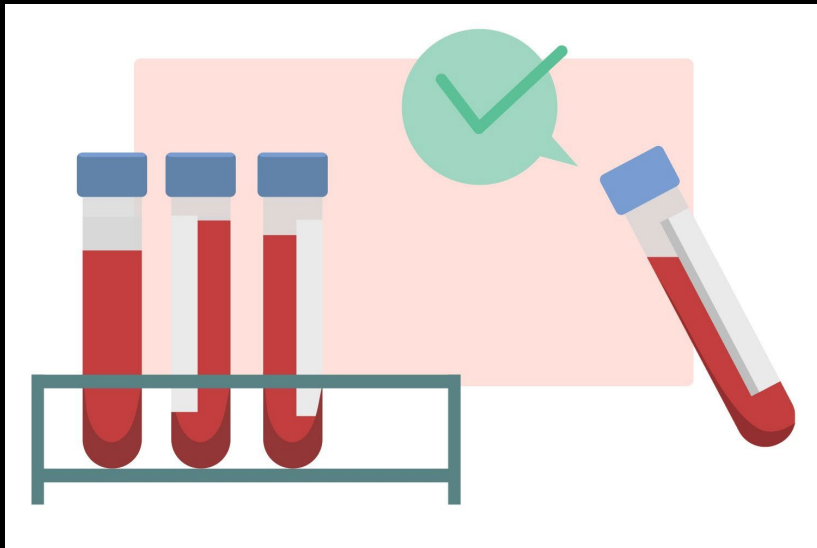
Passenger remarked subject was driving at speeds in excess of 100 mph and suddenly stopped the car

# Two-timer, Pt. 2



- Interview with subject at the hospital
  - Remembers smoking a “blunt” given to him by a stranger
  - Began feeling effects immediately
  - Heard voices, saw shadows, thought “he was in hell and could not get out”
  - Felt as if he “was pulled into a tornado and couldn’t get it to stop”
  - No memory of much, including the officers at the scene or being tased

## Two-timer, Pt. 2



Blood sample sent to WSLH  
for comprehensive drug  
testing = no drugs detected



Results from outsourced lab:

XLR-11: 0.35  
ng/mL

ADB-CHMINACA:  
Positive


# Two-timer, Pt. 2

<b>2015</b>	<b>2016</b>
Sleepy, slow coordination, depressive state	Agitated, combative, paranoia, hallucinations
AB-CHMINACA	XLR-11 ADB-CHMINACA



# Two-timer, Pt. 3?

Arrested for OWI 3<sup>rd</sup>, slumped over wheel



Blood sample sent to WSLH for comprehensive drug testing



Results:

- 400 ng/mL BE
- 

No mention by LE of synthetic cannabinoids, testing not performed



# Acknowledgements

---

- Kimberle Glowacki, Forensic Toxicologist, WSLH
- WSLH Crew



OPIOIDS

# Opioids (Narcotic Analgesics)

- Heroin
- Oxycodone
- Hydrocodone
- Morphine
- Fentanyl(s)
- Internet opioids\*



# Narcotic Analgesics - Common Signs of Impairment



- Low BP/Pulse
- Slowed reaction to light for pupils
  - Will see pupil **constriction**
- Overall lack of coordination and balance
- Slurred speech
- Confusion, disorientation
- On the nod

# Narcotic Analgesics - Common Driving Impairment



- Weaving
  - Within lane, outside of lane
- Driving in the wrong direction
  - Confusion, disorientation
- Misread traffic signs/signals
  - Slowed reaction time
- Crash
  - Slumped over at the wheel



# Novel Synthetic Opioids



# Heroin, Out With the Old?

- Common drug of abuse
- Three main alkaloids in opium
  - Codeine
  - Morphine
  - Thebaine
- Formulated from the opium in poppies
  - Paste is collected and morphine is extracted
  - Morphine then is chemically changed to Heroin



# Adulterants for Opioids

- Diphenhydramine & theophylline (CNS Depressants)
  - Bronchodilators
  - Increase airflow to lungs by decreasing resistance in airway
- Caffeine (CNS Stimulant)
  - Causes heroin to vaporize at lower temperatures
  - More efficient smoking

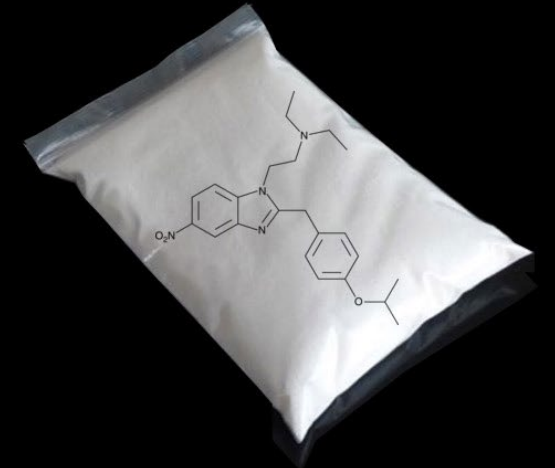
# Narcotic Analgesics

<b>HGN</b>	<b>NONE</b>
<b>VGN</b>	<b>NONE</b>
<b>Lack of convergence</b>	<b>NONE</b>
<b>Pupil size</b>	<b>CONSTRICTED</b>
<b>Reaction to light</b>	<b>LITTLE TO NONE</b>
<b>Pulse</b>	<b>DOWN</b>
<b>Blood Pressure</b>	<b>DOWN</b>
<b>Body Temp</b>	<b>DOWN</b>
<b>Muscle Tone</b>	<b>FLACCID</b>

# Synthetic Opioids

- Fentanyl / Fentanyl analogs
- Isotonitazene
  - Metonitazene
- Brorphine
- AP-237
- We also look for precursors
  - 4ANPP =illicit fentanyl

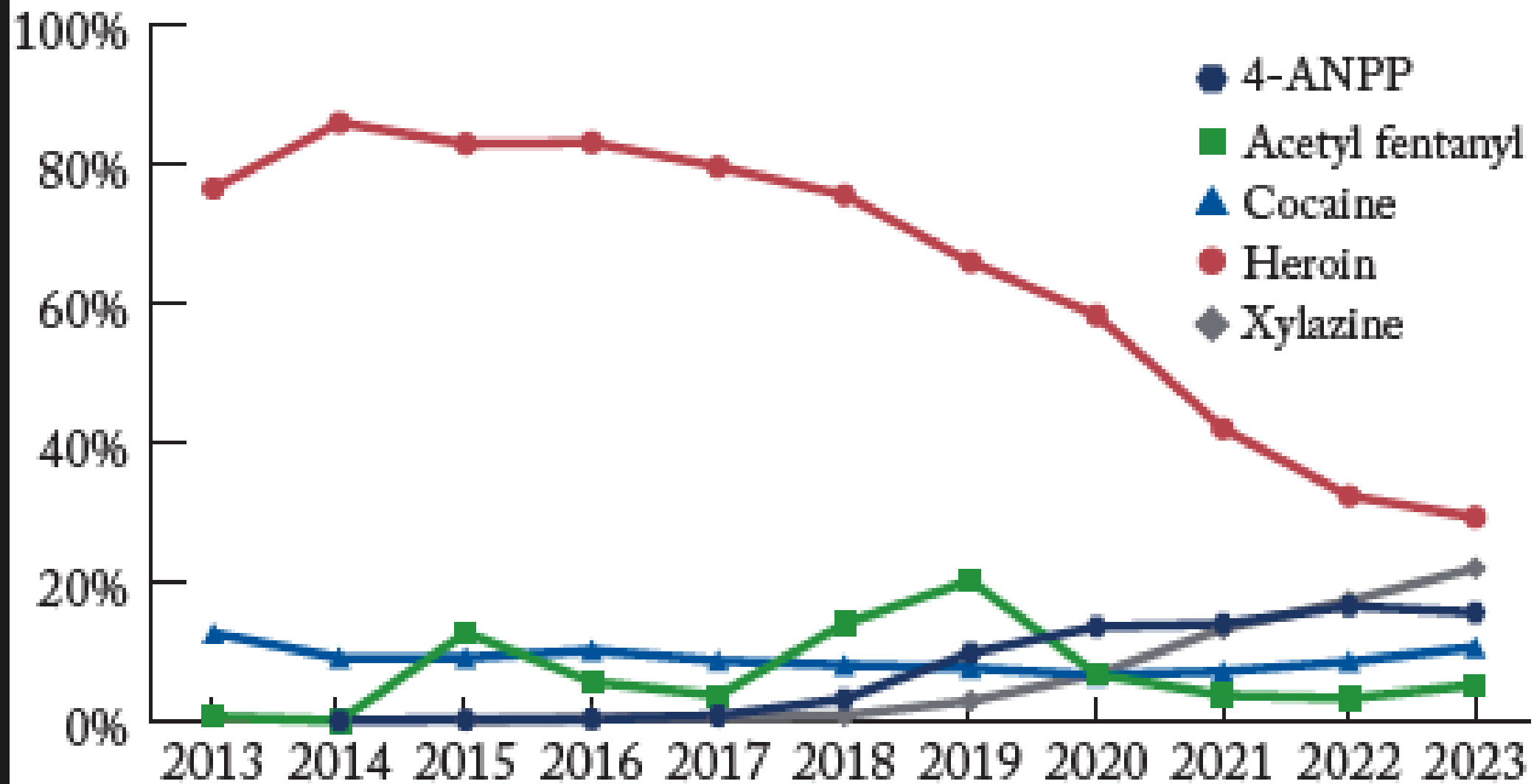
## **Isotonitazene** A New and Potentially Deadly Synthetic Opioid

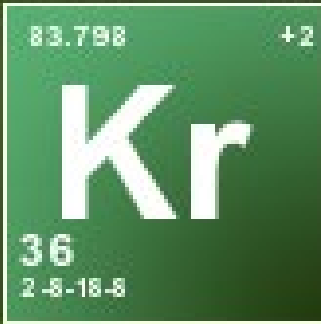


It's sometimes called  
**"Iso"** on the street.

It can be mixed with  
**Cocaine** and **Heroin**.

**Figure 2. Percentage of items containing select substances among all NFLIS-Drug items containing fentanyl and at least one co-reported substance**





atom





# Kratom

- Mitragynine and 7-hydroxymitragynine (7-OH-MG)
- Tree native to Southeast Asia
- Used as an herbal drug
  - Low doses – stimulant
  - High doses – sedative
- Commonly used to self-treat opioid use disorders



# Kratom Dosing

<b>Dosage (Kratom leaves, not extracts)</b>	<b>Effects</b>
<b>2-6 grams</b>	Mild - stimulant
<b>7-15 grams</b>	Stimulant, crossing over to sedative/euphoric/analgesic
<b>16-25 grams</b>	Sedation and euphoria (“too strong for highly sensitive people”)
<b>26-50 grams</b>	Strong sedation and euphoria (“TOO STRONG FOR MOST PEOPLE”)

# Kratom

- Pharmacology
  - Opioid receptor binding
  - Antagonized by naloxone
  - Tolerance develops with 7-OH-MG (mice)
    - Cross-tolerance to Morphine
  - Respiratory depression vs. Codeine



# Kratom

- Administration
  - Chewing leaves
  - Tea
  - Powder/Capsules
- Side effects
  - Numb tongue
  - Nausea
  - Abdominal pain - "...I was forced to spend the rest of the day lying in severe pain" – Erowid user



# Kratom and the FDA/CDC

- Public health advisories issued
  - Potential for abuse/addiction
  - Expand opioid epidemic
- DEA push to make Schedule I
  - Public uproar
  - #savekratom



# Be A Critical Reader / Listener

Tianeptine  
exposure

- “Neptune’s Fix” - Symptoms linked to synthetic cannabinoids

THC laced  
with  
fentanyl

- No basis from public health, national drug monitoring, DEA, Customs and Border Patrol, local drug chemistry and forensic toxicology



# QUESTIONS

