AN OVERVIEW OF OPIOID USE:

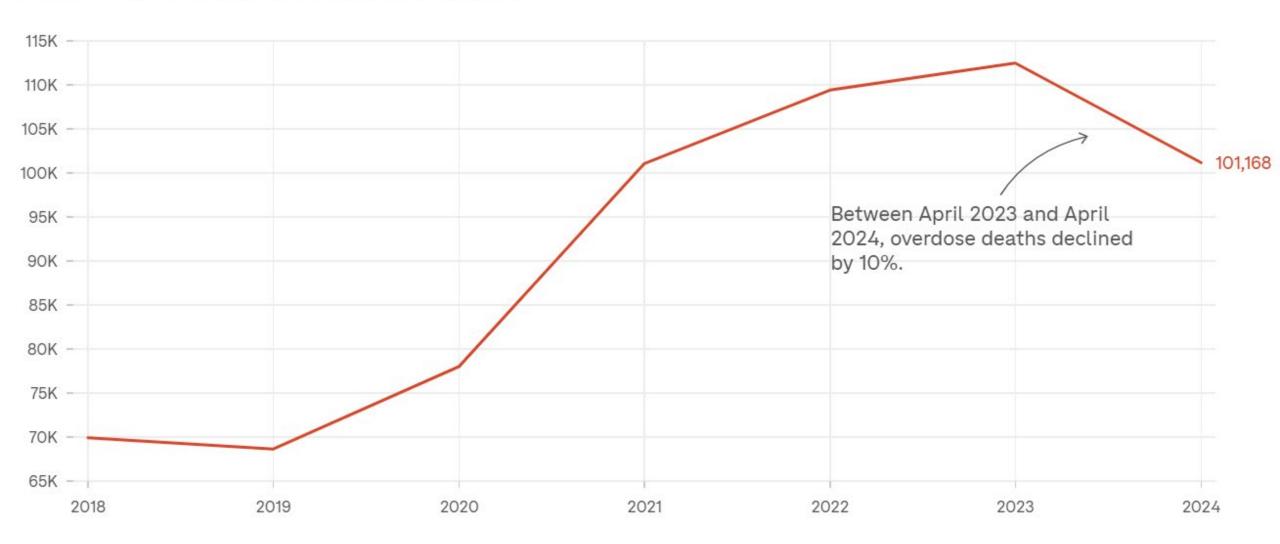
RECENT TRENDS, EMERGING SUBSTANCES AND STRATEGIES FOR PROVIDERS

Andrew Kurtz, LMFT



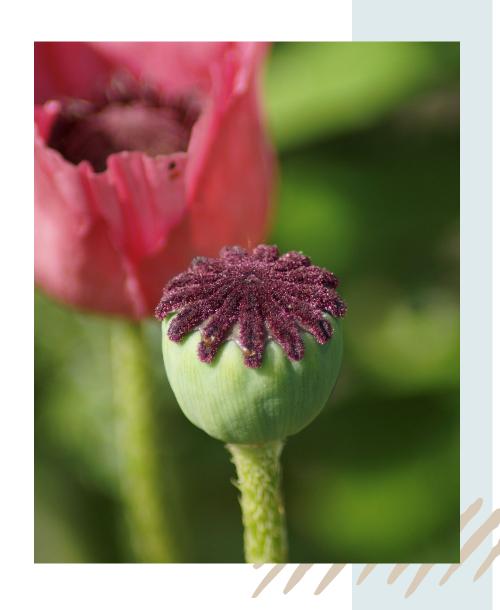
U.S. overdose deaths fell for the first time since 2020

Deaths for the 12 months ending in April of each year



Notes

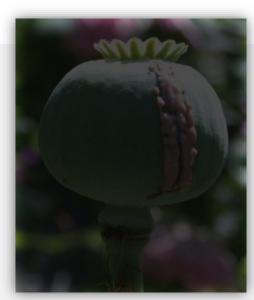
Numbers are predicted provisional overdose deaths in the 12 months ending in April of the given year. Deaths are classified by the reporting jurisdiction where the death occurred.



OPIOIDS

What are Opioids?

- Opiate: derivative of opium poppy
 - Morphine
 - Codeine
- Opioid: any compound that binds to opioid receptors
 - Semisynthetic (including heroin)
 - Synthetic
 - Oral, transdermal and intravenous formulations
- <u>Narcotic</u>: legal designation
- <u>Route of administration</u>: Intravenous, smoked, intranasal, oral, and intrarectal



Opioids

- Semi-synthetic:
 - Oxycodone (Percocet, Oxycontin)
 - Hydrocodone (Vicoden, Norco)
 - Hydromorphone (Dilaudid)
 - Oxymorphone (Opana)
- Synthetic:
 - Meperidine (Demerol)
 - Methadone
 - Fentanyl
 - Buprenorphine (Subutex/Suboxone)



Effects of Opioids

- Euphoria
- Pain relief
- Suppresses cough reflex
- Histamine release
- Warm flushing of the skin
- Dry mouth
- Sense of well-being
- Sedation
- Pupil constriction



- Slurred speech
- Impaired attention/memory
- Constipation, urinary retention
- Nausea
- Confusion, delirium
- Seizures
- Slowed heart rate
- Respiratory depression

Opioids: Long-term Effects

- Addiction
- Infectious diseases, for example,
 HIV/AIDS and hepatitis B and C
- Collapsed veins
- Bacterial infections
- Abscesses
- Infection of heart lining and valves
- Arthritis and other rheumatologic problems



Opioids: Basic facts

Withdrawal symptoms:

- Intensity of withdrawal varies with level and chronicity of use
- Cessation of opioids causes a rebound in functions depressed by chronic use
- First signs occur shortly before next scheduled dose
- For short-acting opioids (e.g., heroin), peak of withdrawal occurs 36 to 72 hours after last dose
- Acute symptoms subside over 3 to 7 days
- Ongoing symptoms may linger for weeks or months

Opioid Withdrawal

- All opioids produce similar withdrawal symptoms when stopped abruptly
 - Severity varies with the amount and duration of use
- Timing of withdrawal symptoms depends on the opioid:
 - With longer-acting opioids, symptoms usually begin later and last longer:

| opioids used | onset of withdrawal | symptoms peak | duration of withdrawal | |
|--------------------------------------------------|------------------------|------------------|------------------------|--|
| short-acting opioids (e.g. heroin, oxycodone) | 6-12 hours | 36-72 hours | about 5 days | |
| long-acting opioids (e.g. methadone) | 36-48 hours | ~ 72 hours | up to 3 weeks | |

Opioids: Heroin

<u>Description</u>:

Heroin is an opioid drug that is synthesized from morphine, a naturally occurring substance extracted from the seed pod of the Asian opium poppy plant.

Heroin usually appears as a white or brown powder or as a black sticky substance, known as "black tar heroin."



Opioids: Heroin Patterns of Use

- May inject up to four times a day
- Intravenous injection provides the greatest intensity and most rapid onset of euphoria (7 to 8 seconds)
- Intramuscular injection produces a relatively slow onset of euphoria (5 to 8 minutes)
- When sniffed or smoked, peak effects are usually felt within 10 to 15 minutes
- Stays in system 1-2 days

Opioids: Prescription Drugs

- Fentanyl (Duragesic®)
- Hydrocodone (Vicodin®)
- Oxycodone (OxyContin®)
- Oxymorphone (Opana®)
- Propoxyphene (Darvon®)
- Hydromorphone (Dilaudid®)
- Meperidine (Demerol®)
- Diphenoxylate (Lomotil®)

Fentanyl

Fentanyl

- A synthetic (man-made) opioid 50x more potent than heroin and 100x more potent than morphine.
- Prescribed in the form of transdermal patches, tablets, lozenges, or nasal sprays.
- Can also be illegally made (illicitly manufactured fentanyl) and mixed into other drugs like heroin or cocaine.

Illicitly Manufactured Fentanyl (IMF)

- Illegally sold for its heroin-like effect, and linked to recent increases in overdose deaths.
- Often pressed into counterfeit pills or mixed with heroin or cocaine, with or without the user's knowledge.
- Fentanyl analogs are drugs that are chemically related to fentanyl and mimic the effects of the drug.

Source: CDC, "Synthetic Opioid Overdose Data," 2020



A lethal dose of carfentanil 1/100th of the amount shown next to the penny.

Potential Lethal Dose Heroin, Fentanyl and Carfentanil



Comparing the size of lethal doses of heroin, fentanyl, and carfentanil. The vials here contain an artificial sweetener for illustration. (New Hampshire State Police Forensic Laboratory)

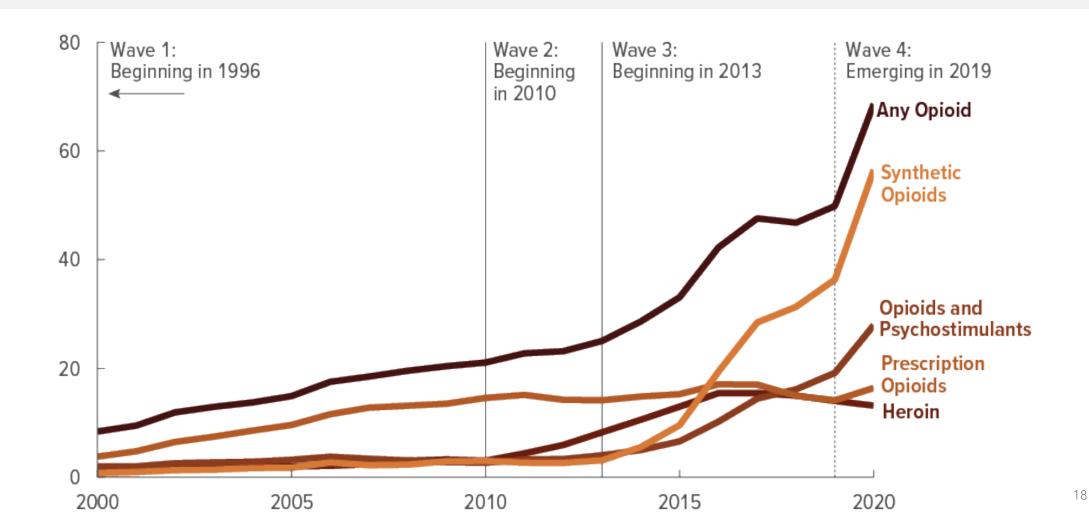
What Causes Drug Poisoning?

- Patient deliberately misuses a prescription opioid or takes an illicit drug such as heroin
- Miscalculation in dose or error in dispensing
- Patient did not follow prescription directions
- Person takes someone else's prescription, or combines opioid with alcohol
- Person uses an opioid analgesic as directed and experiences an unintentional overdose
- Most deaths involve polysubstance use

Who is at Risk?

- Others at risk for drug poisoning include those who:
 - Have a legitimate medical need for analgesia along with a suspected/confirmed history of substance misuse, or non-medical/recreational use of prescription or illicit opioids
 - Are completing mandatory opioid detoxification
 - Were recently released from incarceration and have a history of opioid misuse

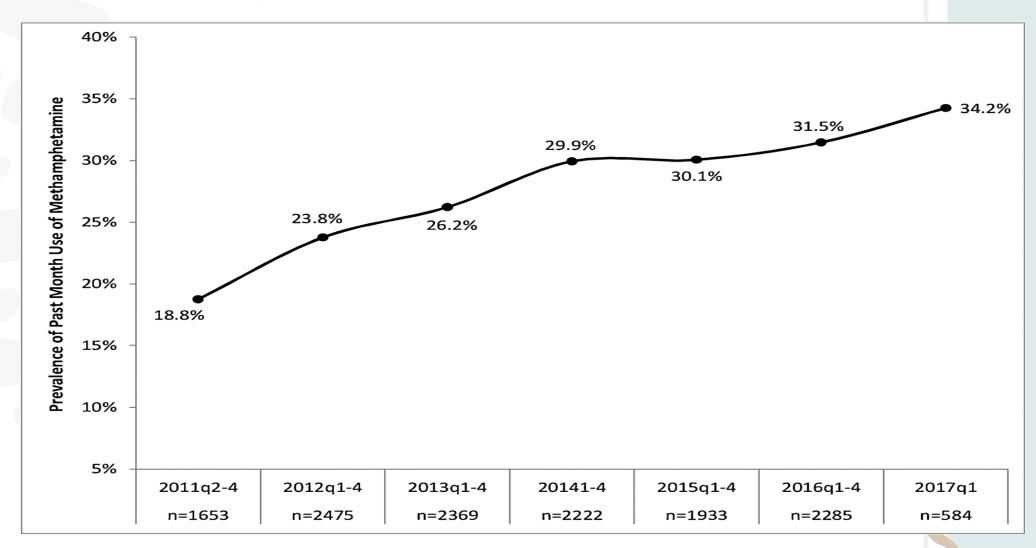
Four Waves of the Opioid Epidemic



Methamphetamine and Opioid Co-Ingestion – What are the Issues?

- A synergistic effect occurs when using meth and an opioid together (i.e., the result of using both is greater than either alone)
- The stimulant effect counterbalances the depressant effect, thus increasing overdose risk (respiratory depression AND cardiac arrest)
- The most potent effect seems to be in the first 90 minutes of coingestion

Past Month Use of Methamphetamine among People Seeking Treatment for an Opioid Use Disorder



What are Some Treatment Implications for Methamphetamine and Opioid Co-Ingestion?

- Make sure you have sufficient naloxone kits available for overdoses
 - Because of the interaction effect, it may require more than one dose to counteract the effects of meth and heroin
- Combine medication-assisted treatment for heroin with contingency management for meth
 - It may be better to use buprenorphine rather than methadone, since methadone and meth would still have a potent interaction (for people who relapse on meth during treatment)
- Exercise may help to reduce methamphetamine use and reduce depression and anxiety symptoms

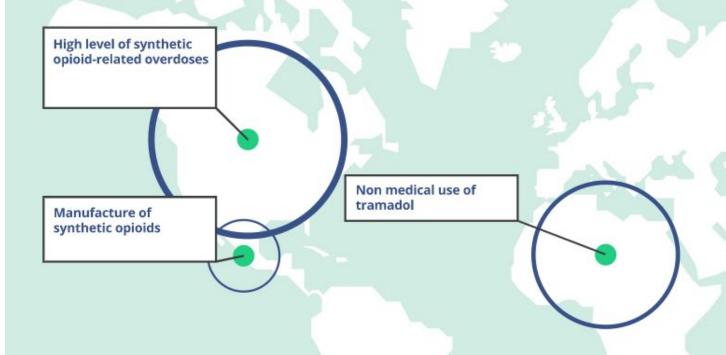
What are New Psychoactive Substances (NPS)?

- Chemically diverse emergent substances in the global drug market
- Rapid evolution/emergence and limited data about health effects poses large challenges related to prevention and treatment
- Analysis, identification, information sharing and monitoring are demanding given how rapidly new substances emerge

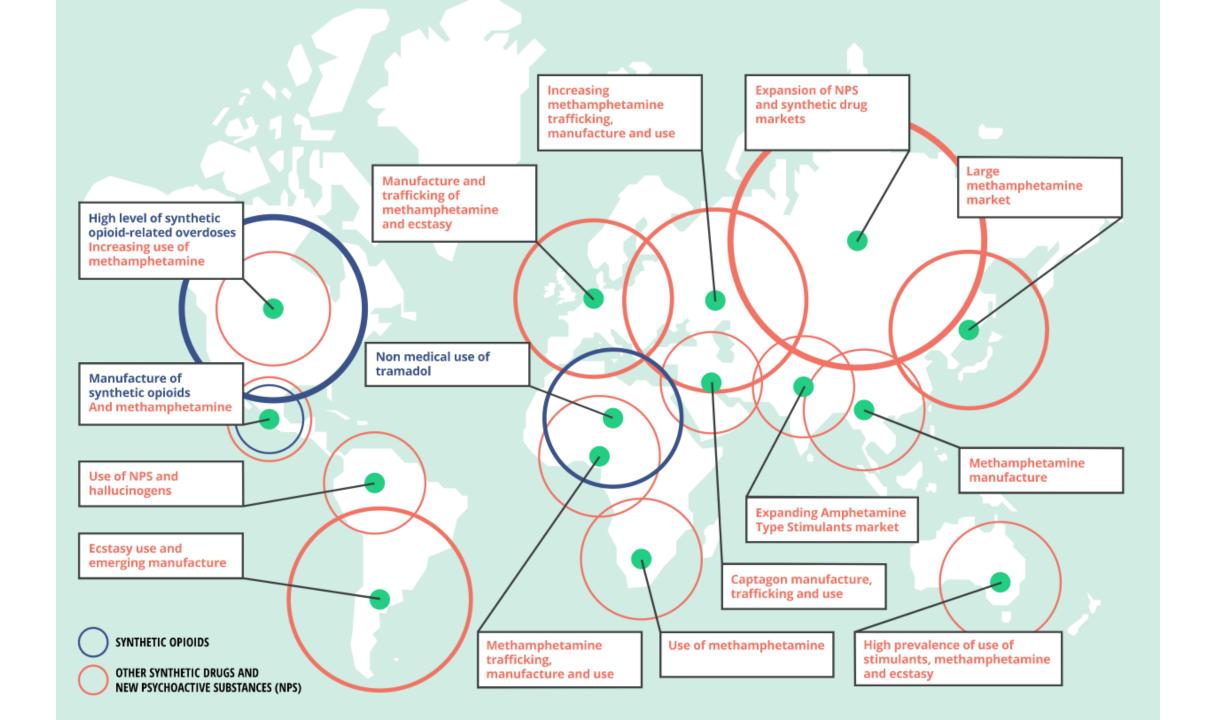
Risks Associated with NPS

- Linked to health problems such as seizures and agitation, aggression, acute psychosis
- Severe intoxication or dependence can result
- Safety data and long-term risks are often unknown
- Purity and composition are often not known
- Polysubstance use can increase risk of hospital admission and death

Global synthetic drug problem







Ecstasy pills sold today often contain more than double

Methamphetamine prices in North America and South

The decrease in prices and increase in availability has

Synthetic drugs are often cheaper than an alcoholic drink in night club settings, which increases their attraction for young people with limited financial resources

overdose.



Adulterants and Health Effects

Adulterant and health effects

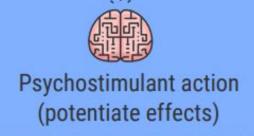
Found in

Mood changes



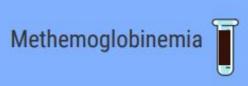
Anxiety





Cocaine Ecstasy Heroin

Local anesthetics (benzocaine, lidocaine, procaine)



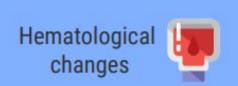




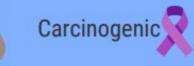
Arrhythmia Seizures (potentiate effects of common drug)

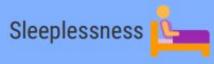
Cocaine Ecstasy Heroin

Phenacetin



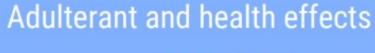
Nephrotoxicity



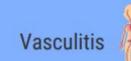


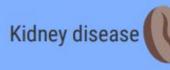
Cocaine Ecstasy Heroin

Adulterants and Health Effects (2)



Levamisole





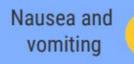
Pulmonary complications



Found in

Cocaine Heroin

Clenbuterol



Tachycardia



Arterial hypotension



Myocardial injury



Heroin

Derivatives of 2 C phenylethylamines (25x-NBOMes)



Seizures



Rhabdomyolysi



Arterial hypertension

Ecstasy Heroin LSD

Fentanyl and derivatives



Depression of consciousness



Cardiorespiratory arrest



Cocaine Heroin LSD

Global Efforts to Manage Synthetic Fentanyl

- Fentanyl poising was first noted in the 1980s
- Most synthetic opioids at that time were manufactured in China and 90% were shipped to the US
- More than 1400 fentanyl analogues have been identified in scientific literature
- In May 2019, China created legislation to curb production and distribution of 1400 fentanyl-related substances
- The US has had scheduling situations in place since 2018
- Despite this, there have been more than 130,000 deaths in North America between 2016 and 2020

(Re)Emerging Synthetic Opioids

- With the void created by this legislation, synthetic opioids developed 6 or 7 decades ago are beginning to re-emerge
- U-compounds developed in the 1970s; generally have a lower potency compared to fentanyl
- Benzimidazole opioids developed in the 1950s; potency tends to be comparable to fentanyl analogues such as sufentanil

SOURCE: Hasegawa et al, 2022

Snapshot of Drug Reports Received by NFLIS-Drug

The tables on the right present the top drug reports in each category received by NFLIS-Drug between July 1, 2023, and September 30, 2023.

| Top 5 Reported | | | |
|-----------------|---------|--|--|
| Drugs | 187,502 | | |
| Methamphetamine | 77,345 | | |
| Fentanyl | 38,078 | | |
| Cocaine | 37,766 | | |
| Cannabis/THC | 27,473 | | |
| Heroin | 6,840 | | |

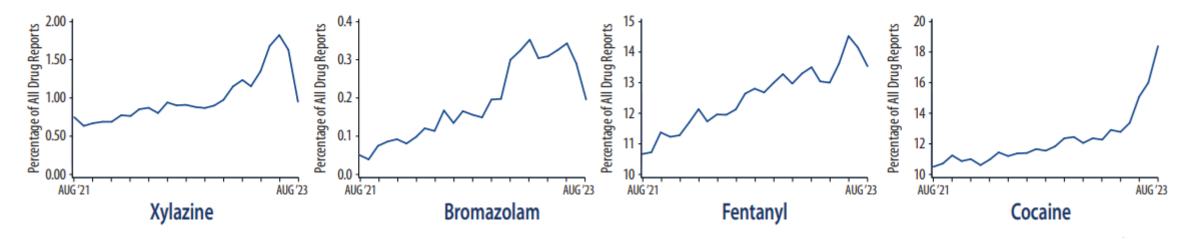
| Psychedelics | 3,481 |
|----------------------------------|-------|
| Psilocin | 1,849 |
| Psilocin/psilocybin | 760 |
| Lysergic acid diethylamide (LSD) | 462 |
| Psilocybin | 410 |

| Selected Benzimidazole | | |
|---------------------------|-----|--|
| Opioids | 355 | |
| Metonitazene | 213 | |
| Protonitazene | 118 | |
| Isotonitazene | 9 | |
| N-Pyrrolidino etonitazene | 9 | |
| Ethyleneoxynitazene | 6 | |

| Steroids | 278 |
|--------------------|-----|
| Testosterone | 166 |
| Trenbolone | 42 |
| Oxandrolone | 25 |
| Methandrostenolone | 23 |
| Nandrolone | 22 |

| Fentanyl-Related Compounds | 9,150 |
|-------------------------------|-------|
| 4-ANPP | 4,643 |
| Fluorofentanyl | 3,267 |
| Fluorofentanyl (unspecified) | 1,975 |
| para-Fluorofentanyl | 1,289 |
| meta-Fluorofentanyl | 3 |
| Acetyl fentanyl | 817 |
| Phenethyl 4-ANPP | 337 |
| Ethyl 4-ANPP | 86 |

Upward Trends, by Date Submitted to Laboratory



Public Health Measures to Manage Fentanyl

- Continued need for harm reduction methods at a public health level
- This might include overdose education, naloxone distribution, and Good Samaritan Laws
- Off-label use of Fentanyl Test Strips (FTS) has been a more recent addition
- FTS should have good sensitivity and specificity
 - A 2019 study compared Raman Spectroscopy, Fourier-transform infrared spectroscopy with FTS from a Canadian biotech company
 - FTS had highest sensitivity and specificity

Public Health Measures to Manage Fentanyl: FTS

- FTS were originally developed to test urine in clinical settings
- Low cost and ease of use have transitioned product to wider use
- One study found that younger individuals (18-35) had high levels (more than 90%) of willingness to use FTS
- Recent studies indicate that use of FTS prompted reduced use and other informed choices among individuals using substances

New Fentanyl Compounds

- Other fentanyl compounds are appearing in heroin, counterfeit pills and in autopsy findings.
- Para-fluorofentanyl was developed through research efforts in the 1960's and classified as a schedule I substance.
- Para-fluorofentanyl is showing up now in seized heroin, counterfeit pills, and autopsy findings.

SOURCE: Trecki et al, 2022

New Opioid Class

- Benzimidazole was developed in the 1950's as a new opioid analgesic and is now showing up as a heroin adulterant.
- Metonitazene, an opioid in the benzimidazole class, is also showing up more frequently.

SOURCE: Trecki et al, 2022

Benzimidazole Opioids (Nitazines)

- Synthetic opioids have begun to emerge on the illicit market globally in 2019 (WHO, 2020)
- Some types (isotonitazine) estimated to be 500 times more potent than morphine (WHO, 2020)
- Appears to be contributing to overdose deaths in Illinois, Indiana, and Ohio (USA Today, 2020)
- Emerging drug so it does not appear on standardized drug tests (USA Today, 2020)
- Continues trend of new synthetic opioids appearing

Source: World Health Organization, 2020; USA Today, 2020

Emerging Substances: Xylazine

- Xylazine is a non-opioid sedative, analgesic, and muscle relaxant used in veterinary medicine and not approved for human use.
- It has been found among people who use drugs in Puerto Rico since the early 2000s and referred to as "anestesia de caballo"

Impacts of Xylazine

- In humans xylazine can cause hypotension, central nervous system depression, respiratory depression, and bradycardia.
- It also causes open skin ulcers among injectors who may continually inject affected areas for pain relief.

Emerging Cases of Xylazine in Philadelphia

- Philadelphia street name for xylazine is "tranq"; heroin or fentanyl cut with xylazine is called "tranq dope."
- The following study examines trends in xylazine detection among post mortem toxicology tests in fatal overdoses in Philadelphia between 2010 and 2019.

Emerging Cases of Xylazine in Philadelphia (3)

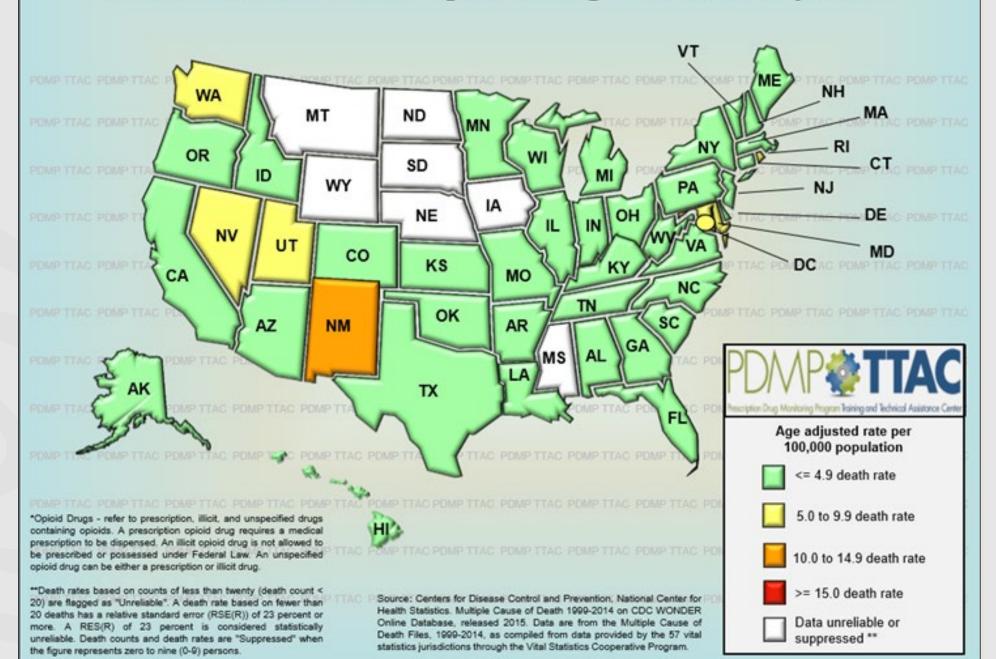
- Those positive for xylazine were mainly male (76%), between the ages of 35 to 54 (47%), and non-Hispanic white (65%).
- Among 2019 decedents positive for xylazine:
- 100% were positive for fentanyl,
- 10% positive for heroin,
- 12% were positive for methamphetamine,
- 28% were positive for benzodiazepines,
- 53% were positive for cocaine.

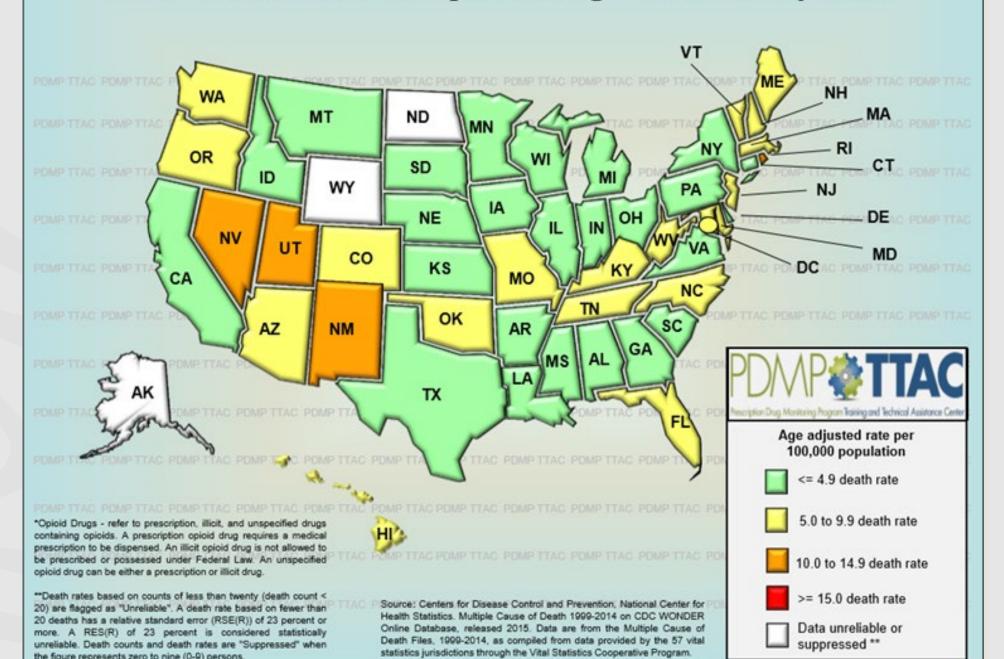
Systematic Review of Xylazine Mortality (3)

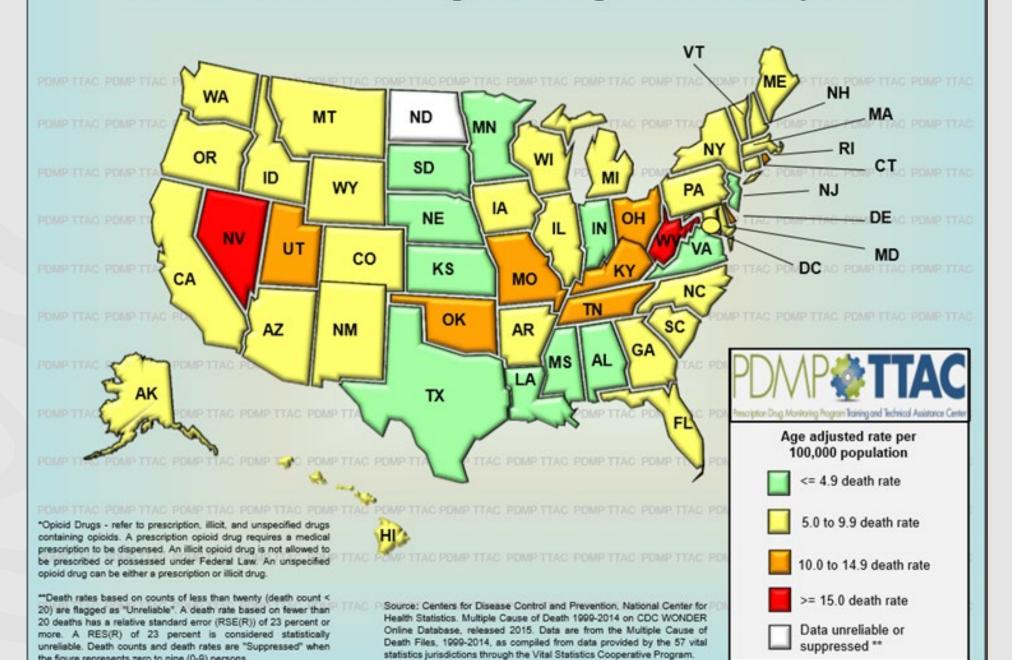
- Fentanyl was found in 98.4% of xylazine-present overdose deaths.
- PWID in Philadelphia described xylazine as a sought-after adulterant that lengthens the short duration of fentanyl.
- Also reported were more abscesses and naloxone-resistant overdoses.

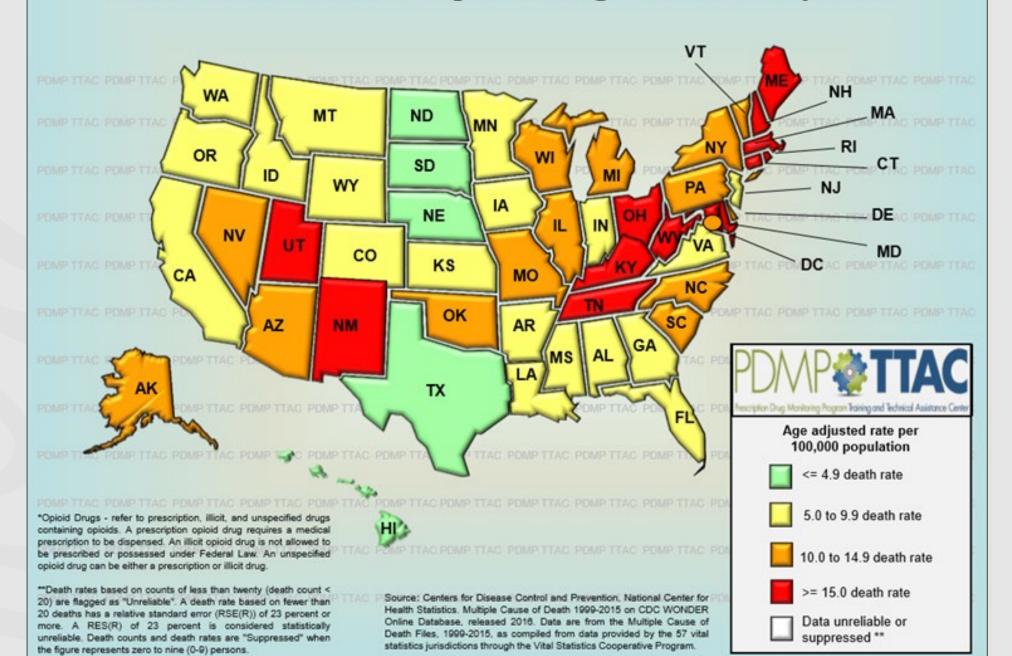
Other Trends: Gabapentin

- Gabapentin and pregabalin are anti-epileptics or non-opioid alternatives to manage neuropathic pain
- In a 2015 study of 5 geographically diverse regions, 22% of all overdose deaths tested positive for gabapentin
- Used in combination with opioids to strengthen effects
- May be used as self-medication for insomnia, anxiety, and withdrawal
- Emerging substances are regularly updated: https://www.nflis.deadiversion.usdoj.gov/

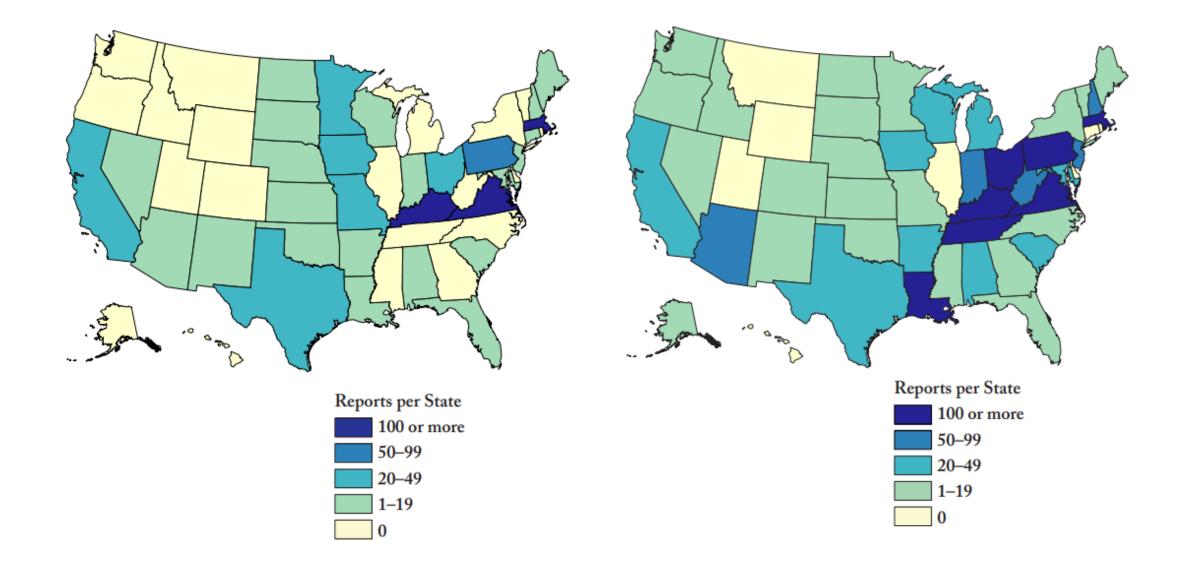








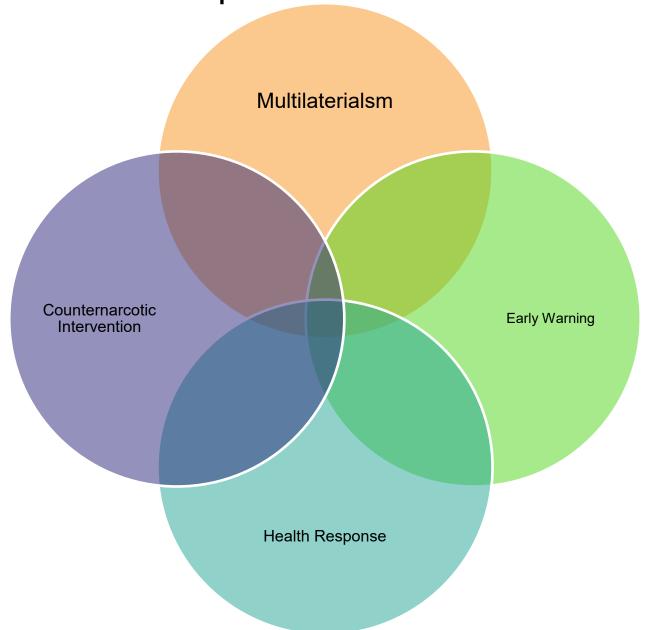
Gabapentin Reports 2011-2020



Gabapentin Effects

- Low dose is defined as < 900 mg, moderate dose as 900–1799 mg and high dose as > 1800 mg
- Gabapentin's exact mode of action is unknown
- It is structurally similar to GABA but does not directly bind to GABA receptors
- High-dose gabapentin is associated with a twofold increase in adverse effects, including somnolence, tremors, ataxia and nystagmus
- Exposure to moderate-dose and high-dose gabapentin is associated with a 60% increased risk of opioid-related death compared with opioids alone

Strategies to Address Use of Emerging Substances: 4 Spheres of Action



Sphere 1: Multilaterialsm and International Cooperation

- Support scientifically-informed deliberations and international cooperation to identify emerging drug challenges
- 2. Support development of frameworks incorporated into national decision-making
- 3. Support the prioritization of the most harmful and persistent substances for international action

Sphere 2: Early Warning on Emerging Drug Threats

- 1. Enable early detection and prompt response by national institutions to emerging drugs and precursor chemicals
- 2. Promote and improve processes for development of evidence-based responses, with particular focus on youth and women
- 3. Strengthen the capacity for laboratory testing
- 4. Build the capacity for early warning systems worldwide
- 5. Support the development of global campaigns to raise awareness
- 6. Enter into partnerships with forensic and scientific associations
- 7. Increase the understanding of toxic adulterants and use of pharmaceuticals in the production of drugs

Sphere 3: Promote Science-Informed Health Response

- 1. Promote non-stigmatizing attitudes with a focus on gender and marginalized communities with a goal of enhancing access to care
- 2. Promote awareness-raising, education, and training
- 3. Promote and facilitate access to science-based, affordable, and quality drug prevention, treatment and care
- 4. Enhance international scientific collaborations
- 5. Enhance guidance for management of infants born with neonatal abstinence syndrome, particularly to synthetic opioids
- 6. Promote measures to reduce transmission of HIV and hepatitis C attributable to drug use
- 7. Improve the participatory role of people who use drugs in addressing the problem
- 8. Promote the involvement of youth in prevention efforts

Sphere 4: Strengthen Disruptions in Trafficking

- 1. Leverage technology and innovation to make science available to law enforcement agencies
- 2. Promote public-private partnership in identification and interdiction, including disposal
- 3. Prevent diversion in precursors and pre-precursors
- 4. Enhance online investigative capacity
- 5. Build the capacity of frontline law enforcement and forensic personnel
- 6. Enhance access for criminal justice systems to science services
- 7. Encourage the development of national disposal guidelines

Sphere 4: Strengthen Disruptions in Trafficking (2)

- According to NFLIS, the total number of drugs reported in 2021 increased
- However, the total number of cases continued to decrease from 2019
- What accounts for the decrease?
- A number of factors including disrupted markets (manufacturing and distribution), staffing and reporting (law enforcement and laboratories) due to lingering COVID impacts

SOURCE: NFLIS 2021 Annual Report

United Nations Toolkit on Synthetic Drugs



https://syntheticdrugs.unodc.org/syntheticdrugs/en/toolkit-index.html

Early Warning Systems

- Early Warning System for the Americas (SATA)
- Monitors and reports on emerging drug threats made available throughout North and South America
- http://www.cicad.oas.org/Main/Template.asp?File=/oid/sata/default_eng.asp

Guidelines For Treatment: WHO and UNODC

- https://syntheticdrugs.unodc.org/syntheticdrugs/en/treatme
 nt/managementDUD/identification.html
- Recommends incorporating aspects of:
 - Outreach services
 - Screening and brief intervention
 - Inpatient and outpatient treatment
 - Evidence-based pharmacological treatment and psychosocial interventions
 - Long-term residential treatment, rehabilitation and recovery-support services

Communicating About Overdose Prevention

Berkeley Media Studies Group & The National Overdose Prevention Network

https://www.bmsg.org/resources/publications/mes sage-guide-for-communicating-about-overdoseprevention/#define-your-overall-strategy





Specific Treatment Approaches

Medications for Addiction Treatment

Motivational Interviewing

Cognitive-Behavioral Therapy

Purpose of Medication for OUD

- 1. Control symptoms of opioid withdrawal
- 2. Restore emotional and decision-making capacities
- 3. Suppress opioid cravings
- 4. Block the reinforcing effects of ongoing opioid use
- 5. Promote and facilitate engagement in recoveryoriented activities
- 6. Coupled with behavioral interventions
 - a. Enhance the salience of natural, healthy rewards
 - b. Reduce stress reactivity and negative emotional state
 - c. Improve self-regulation
 - d. Increase avoidance of relapse triggers

Goals of Medication for OUD

- Reduce mortality. (Save lives!)
- Reduce associated morbidity
 - Transmission of blood-borne viruses
 - Infectious complications from IV drug use
- Reduce opioid use
- Increase retention in treatment
- Improve general health and well-being
- Reduce substance-related crime

Brief Negotiated Interview (BNI)

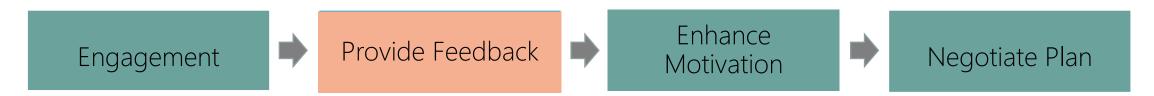
- A specialized "brief intervention" has foundations in motivational interviewing (MI) techniques. It was originally created for the emergency department in collaboration with Stephen Rollnick.
- Structures the conversation with the support of the BNI "algorithm."
- Designed to elicit reasons for behavior change from the individual, entering their voice and autonomy.
- Individual can end the conversation at will.

BNI Algorithm (1)

Engagement Provide Feedback Motivation Negotiate Plan

- Build Rapport
- Raise the subject
- Ask permission

BNI Algorithm (2)



- Elicit permission. Provide information. Elicit response. (EPE)
- Non-confrontational and neutral
- Zero in on main concern(s)

"Would it be okay for us to talk more about it? ... With the increased prevalence of xylazine in the opioid supply, severe wounds are causing more sepsis and amputations among those who use drugs. What are your thoughts and/or concerns related to your wounds?"

BNI Algorithm (3)

Engagement Provide Feedback Motivation Negotiate Plan

- Evoke the individuals' reasons for change and reflect on those (change talk)
- Readiness ruler
- Develop discrepancy

"On a scale from 1-10, how likely are you to seek medical care for your wound? Why did you choose ___ and not (a lower number)___?"

"On one hand you recognize this wound is painful and potentially and serious medical concern and on the other seeking medical care feels like a waste of time given your past experiences."

BNI Algorithm (4)



- Develop a collaborative action plan: can use EPE
- Explore challenges
- Assess confidence
- Summarize

"Would you be interested in developing a plan together?"

"While you are not comfortable going to the hospital you might be open to checking out the mobile care clinic that comes by on Tuesdays. You also felt like it's important to monitor your wounds for pain or color changes and you might consider seeking additional care if you notice concerning change. Did I capture everything?"

Patient Education: Safer Use Practices

- Best to avoid unknown substances, if you can.
- Go slow, use less
- Get your drugs tested at a harm reduction program, if you can (or utilize test strips).
- Try to avoid using alone. Because of potential effects like sedation, be aware of your surroundings and your possessions, especially if you're somewhere that's not secure.
- If you are using alone, double down on other strategies. Have someone check on you. If you are using in a group, stagger your use so someone is always sufficiently alert.
- Carry naloxone and know how to use it (xylazine is often mixed with fentanyl).
- Be sure the airway is open, as breathing may be blocked in slumped positions. (recovery position)

THANK YOU

Andrew Kurtz <u>askurtz@mednet.ucla.edu</u>

