PTTC HHS REGION 9
Pacific Southwest

Emerging Drug Trends in the Pacific Southwest

Part 2: Emerging Trends and Novel Substances Impacting the Opioid Epidemic

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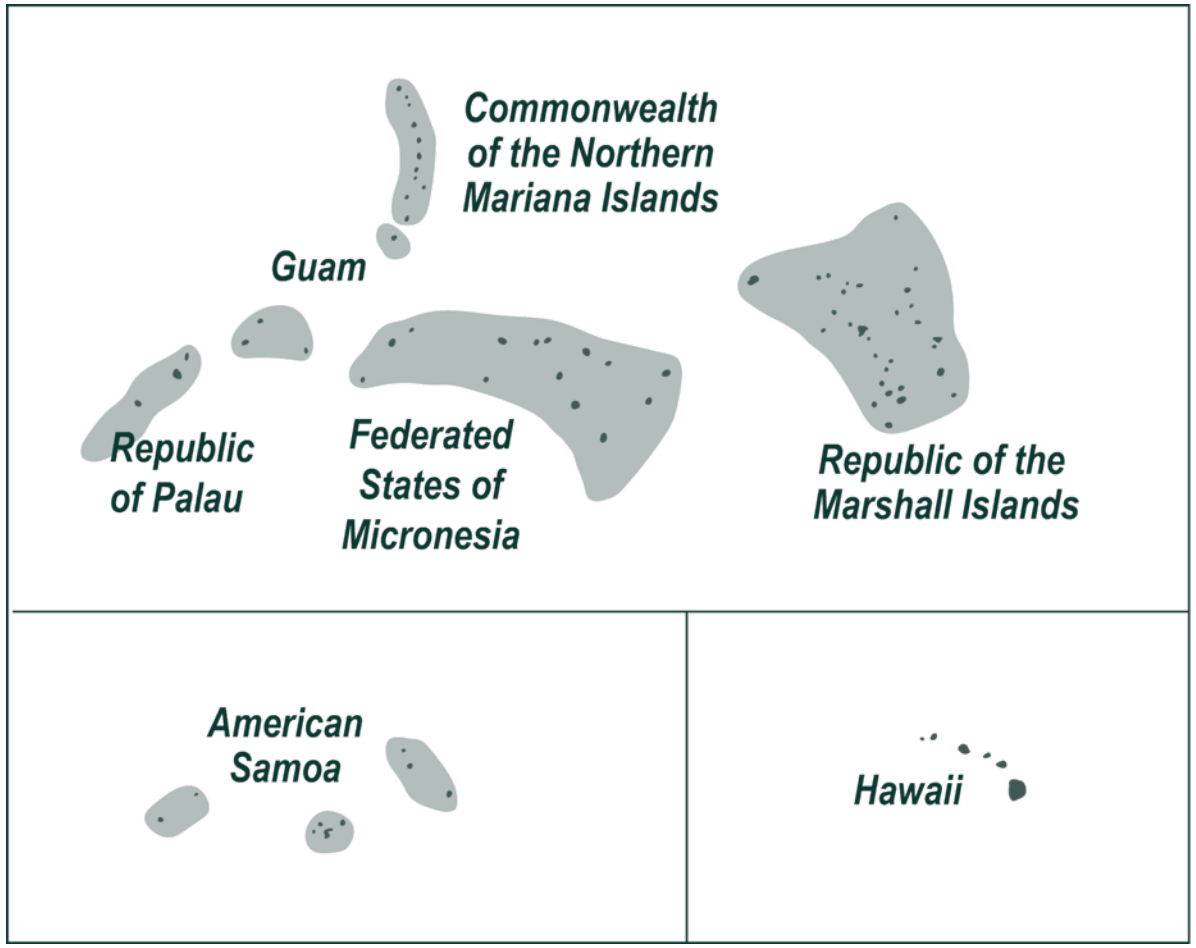


2026 Youth Prevention Institute

PTTC Pacific Southwest HHS REGION 9

C4BHI

ADAPT
A Division for Advancing Prevention & Treatment
CULTIVATING PREVENTION

HIDTA
High Intensity Drug Trafficking Area
San Diego and Imperial Counties

CAHMI
The Child & Adolescent Health Measurement Initiative

Join us April 28 and 29, 2026 for an inspiring and impactful gathering of professionals dedicated to building protective factors in their communities through connection and health-promoting relationships with youth.

This event is co-hosted by the Pacific Southwest PTTC and the San Diego-Imperial Valley HIDTA in partnership with ADAPT, the Child and Adolescent Health Measurement Initiative, and the Center for Behavioral Health Integration.

Housekeeping

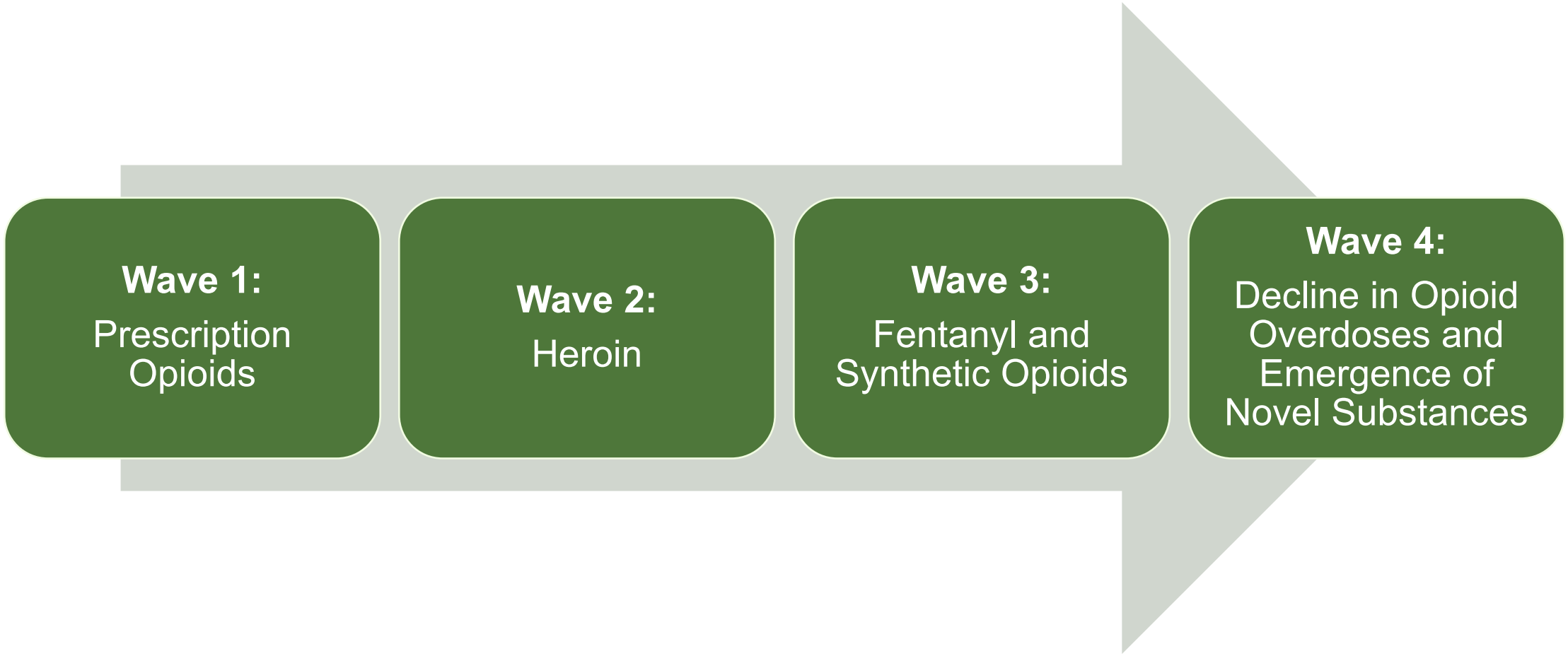
- Chat feature
- Q&A feature
- Webinar recording and materials
- Certificates of attendance

Learning Objectives

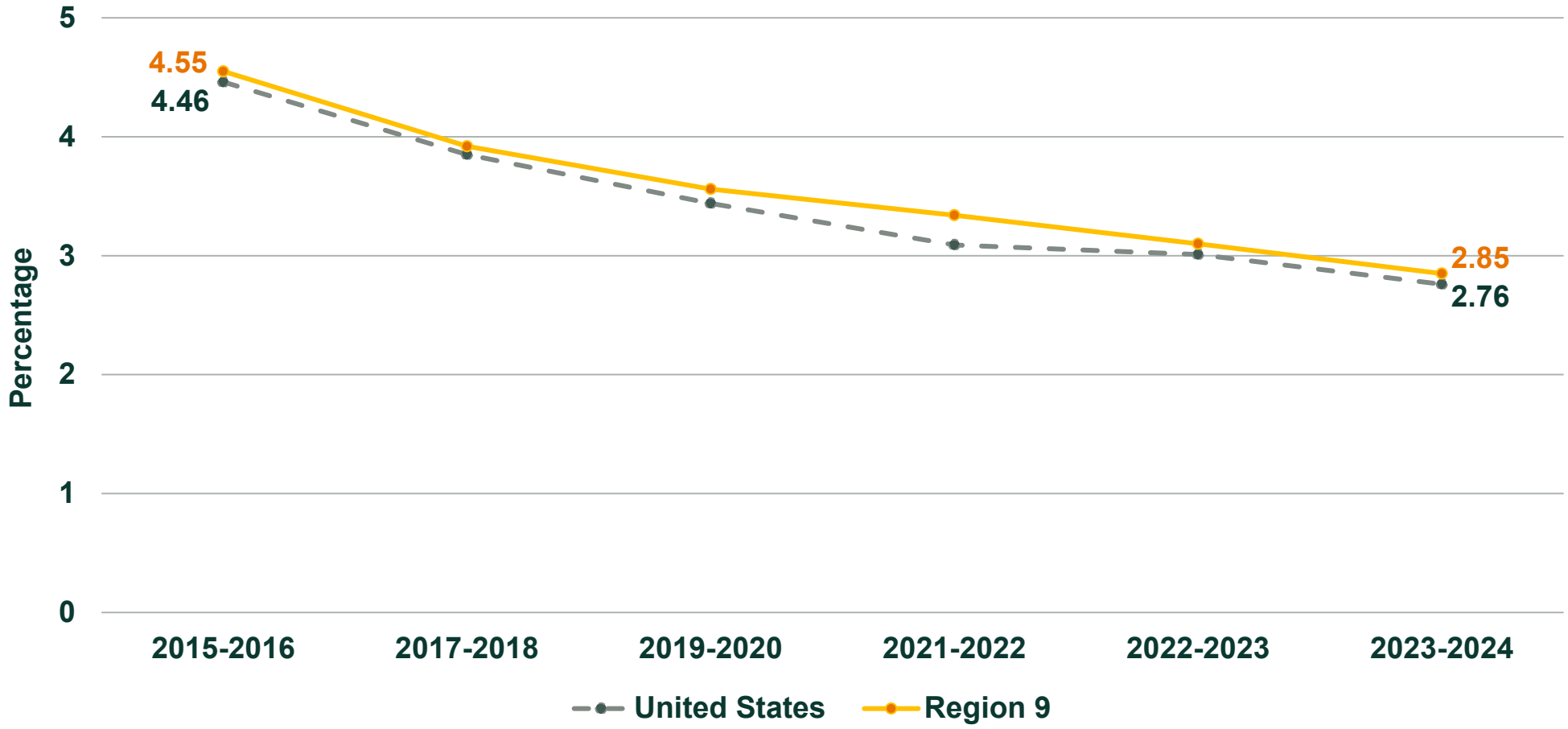
1. Describe the recent history and current status of the opioid epidemic
2. Recognize the novel substances influencing the opioid epidemic
3. Explain the history, effects, and scope of these novel substances
4. Identify opportunities for prevention to address these substances

The Recent History and Current Status of the Opioid Epidemic

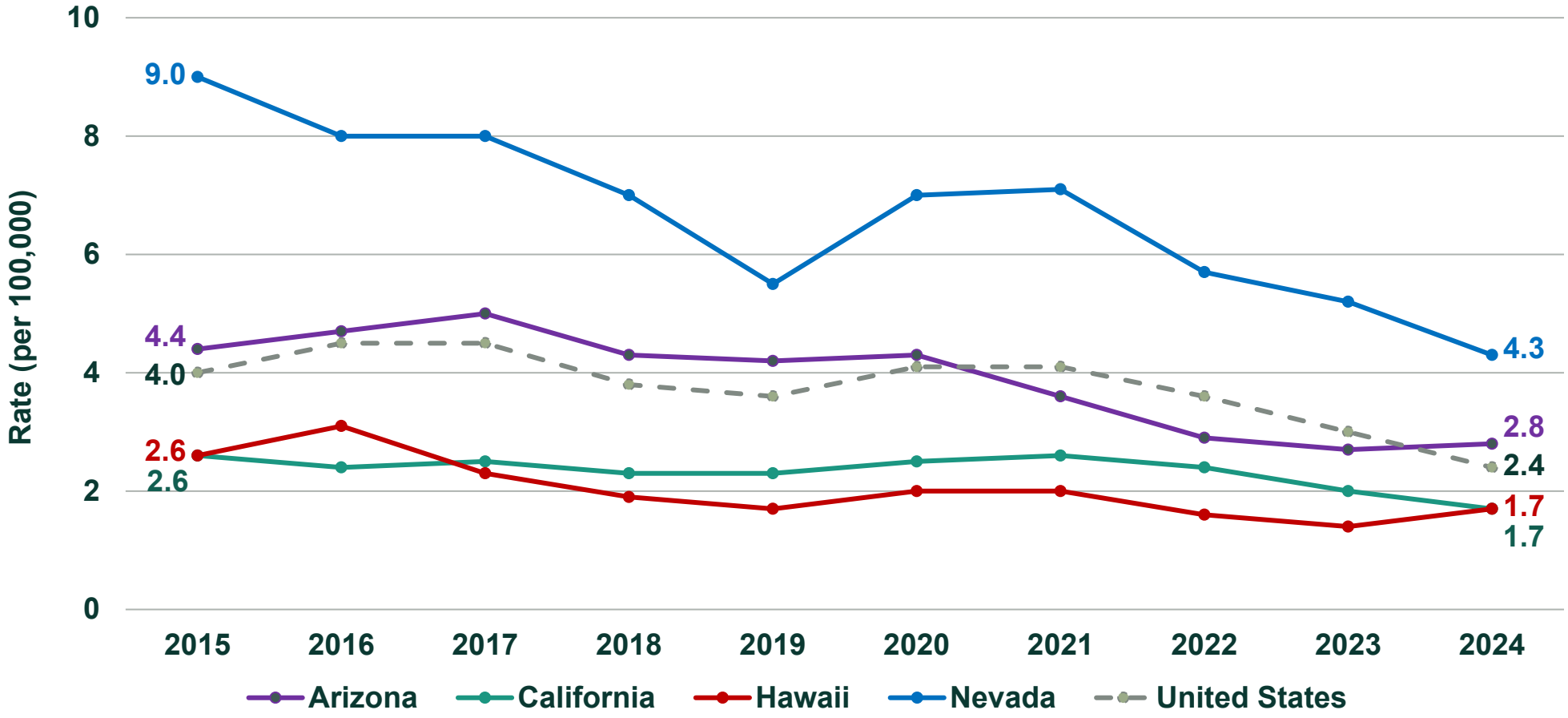
History of the Opioid Epidemic



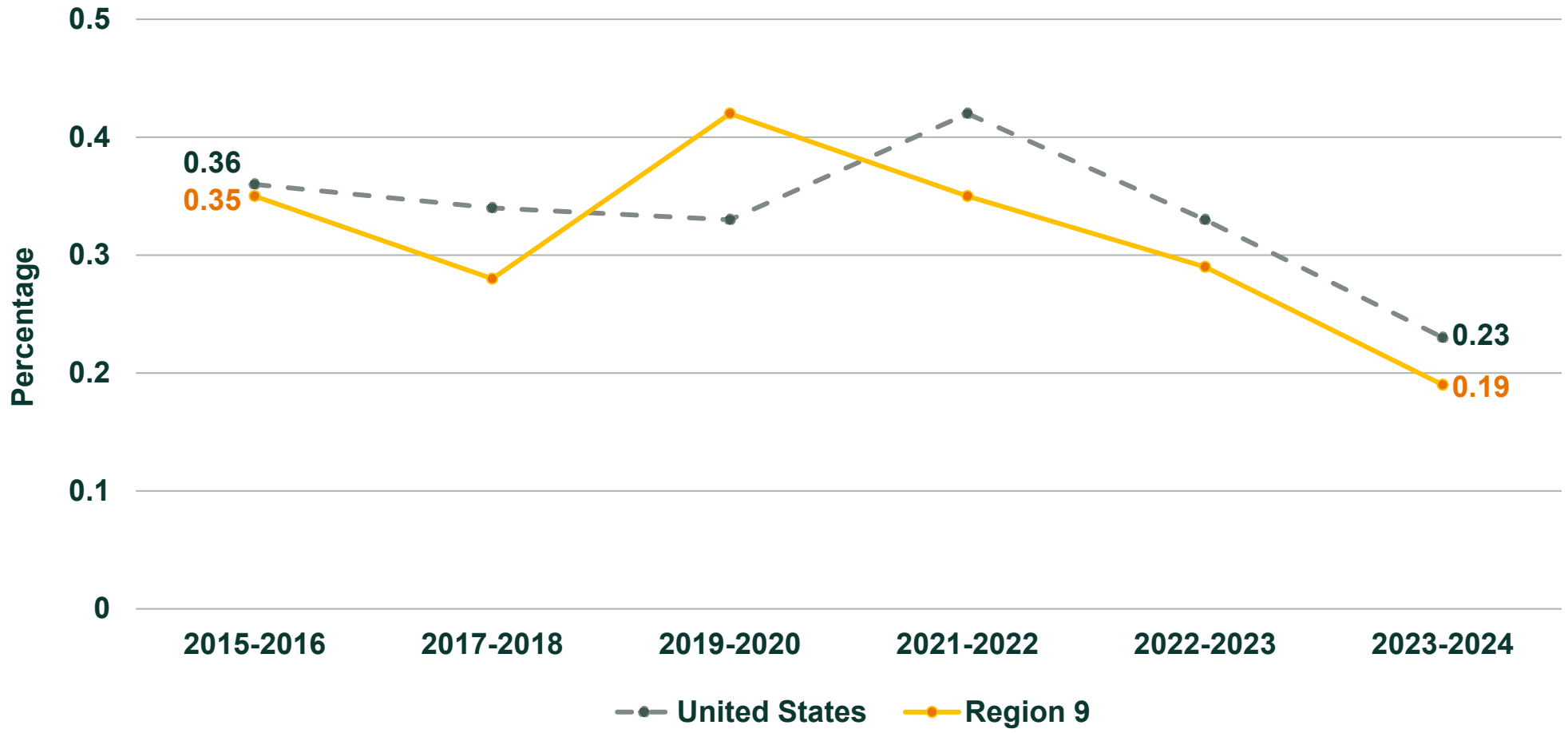
Past-Year Prescription Pain Reliever Misuse[55]



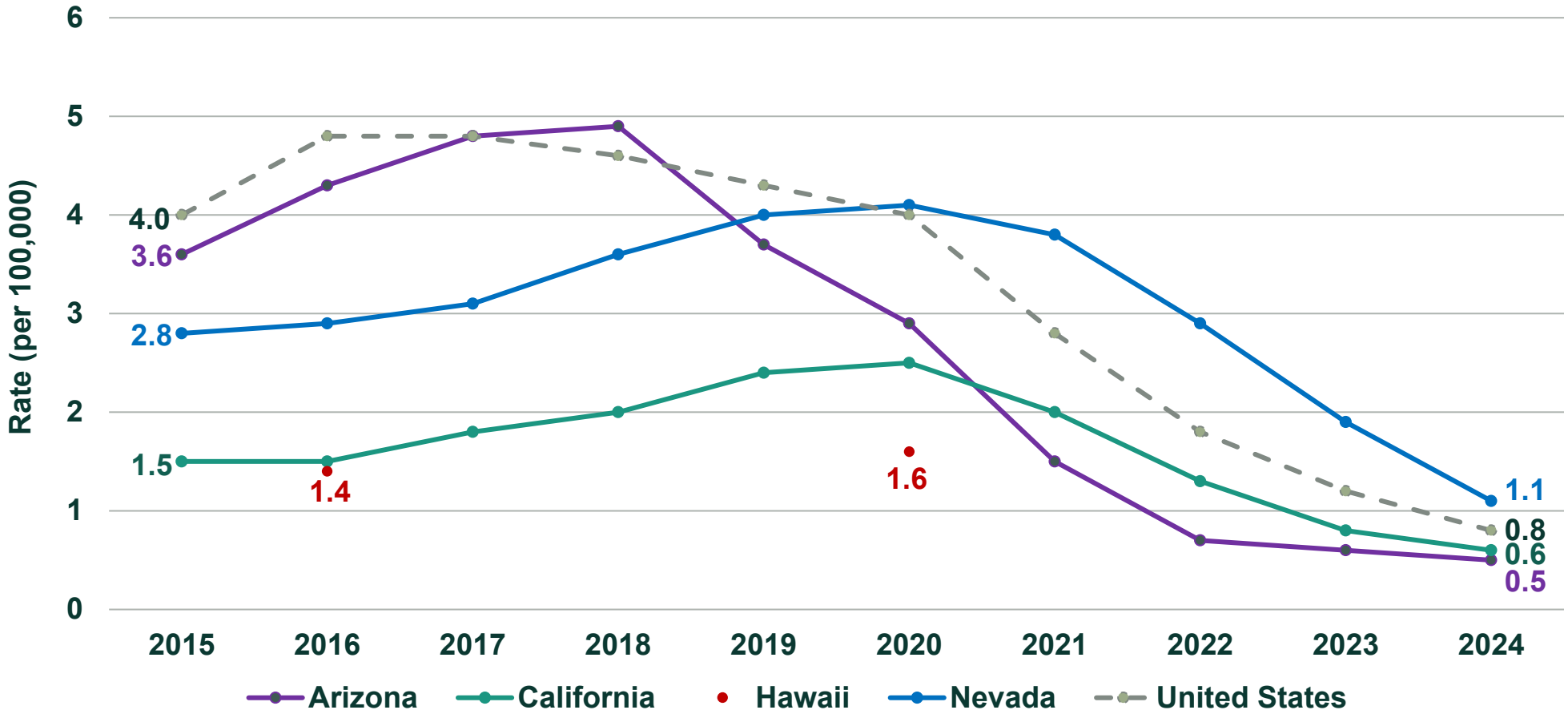
Fatal Overdoses Involving Prescription Opioids[5]



Past-Year Heroin Use[55]

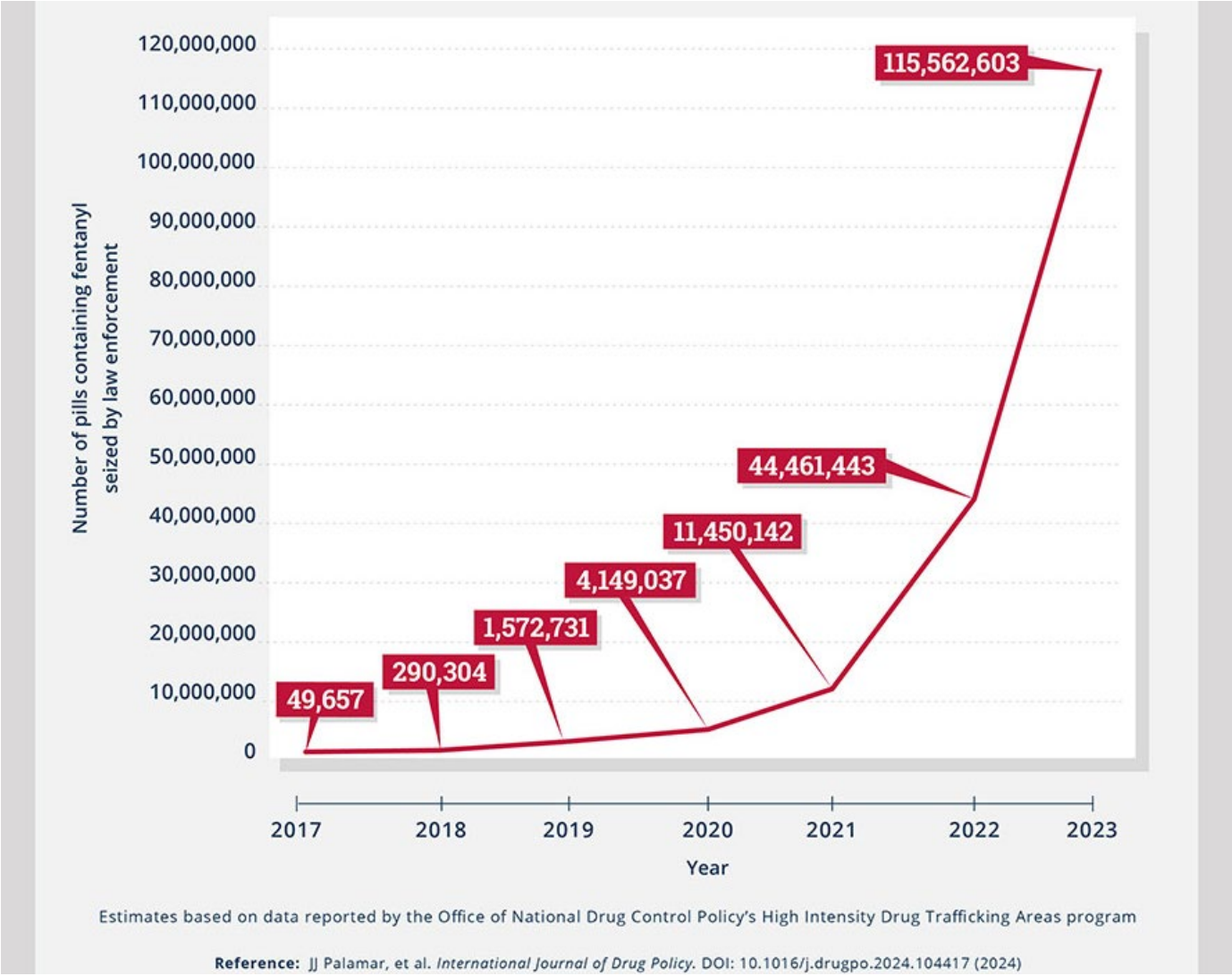


Fatal Overdoses Involving Heroin[5]

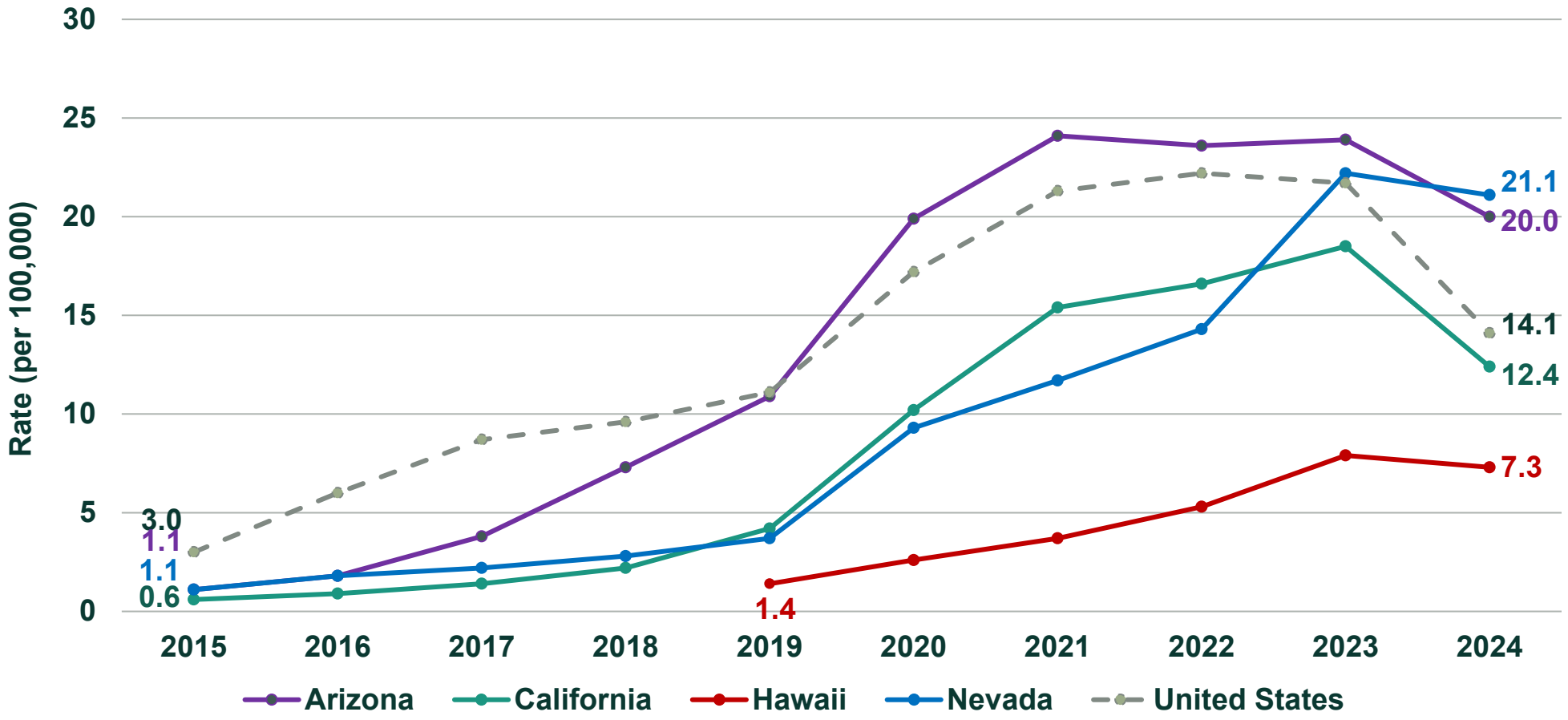


Fentanyl Misuse

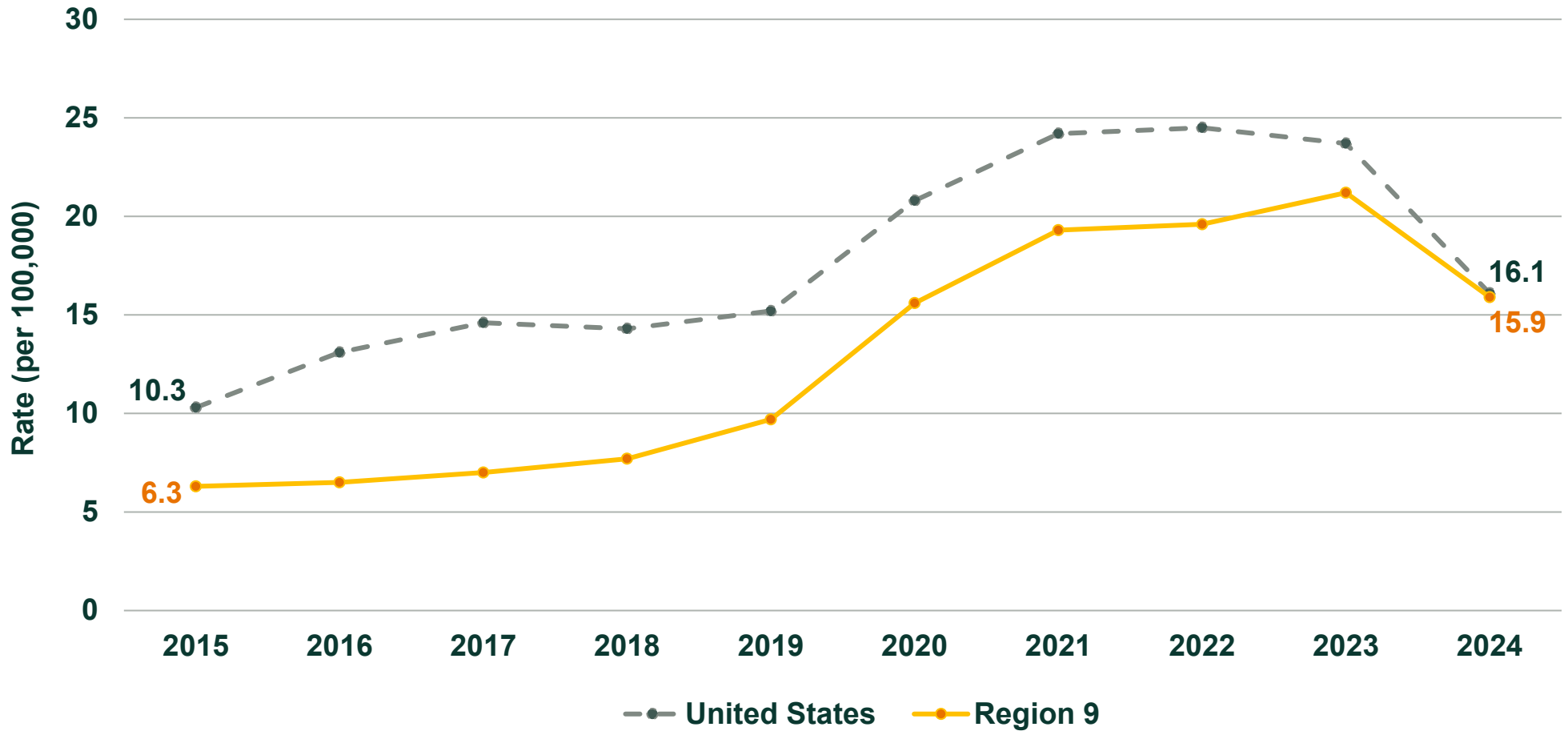
- NSDUH is one of the only surveys that tracks fentanyl misuse
- Past-year fentanyl misuse peaked to **0.4%** in 2022 and was **0.3%** in 2023[56]
- Number of pills containing fentanyl seized by law enforcement increased **232,000%+** 2017-2023[47]



Fatal Overdoses Involving Fentanyl[5]



All Fatal Opioid-Involved Overdoses[5]



Discussion Question 1

What has the opioid epidemic looked like in your community? Has it followed similar patterns?

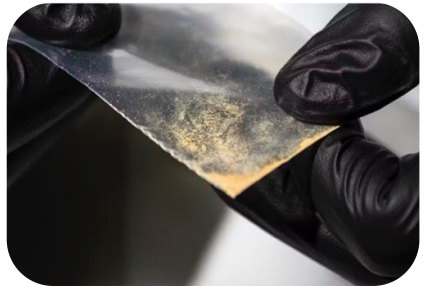
Recent Shifts in Opioid Overdose Trends: What's Next?

- For many years, opioid overdose rates were steadily increasing, even as use rates stabilized or declined
- But recent data shows overdose rates declining the past two years
  - Perhaps dramatically in 2025, but data are partial
- Several novel substances have emerged recently, many of which are directly influencing the opioid epidemic
- Novel substances can have serious, as well as still unknown, consequences and present new challenges for substance use prevention

Novel Substances Influencing the Opioid Epidemic

Substances We're Covering Today

Fentanyl Analogs



Nitazenes

Xylazine

Medetomidine

Tianeptine

Kratom

Poll Question 1

Which of these substances are present in your community?

- Fentanyl analogs
- Xylazine
- Medetomidine
- Nitazenes
- Tianeptine
- Kratom
- None of the above
- I’m not sure

Fentanyl Analogs

- Illicitly manufactured synthetic opioids with a similar chemical structure to fentanyl[61]
- Sometimes known as “fentalogs”
- Fentanyl analogs are extremely potent
  - E.g., carfentanil is **100xs** more potent than fentanyl[17]
- Over **1,400** fentanyl analogs synthesized. Examples of common analogs include:[3]
  - Para-flourofentanyl
  - Carfentanil
  - Acetyl fentanyl
  - Furanylfentanyl

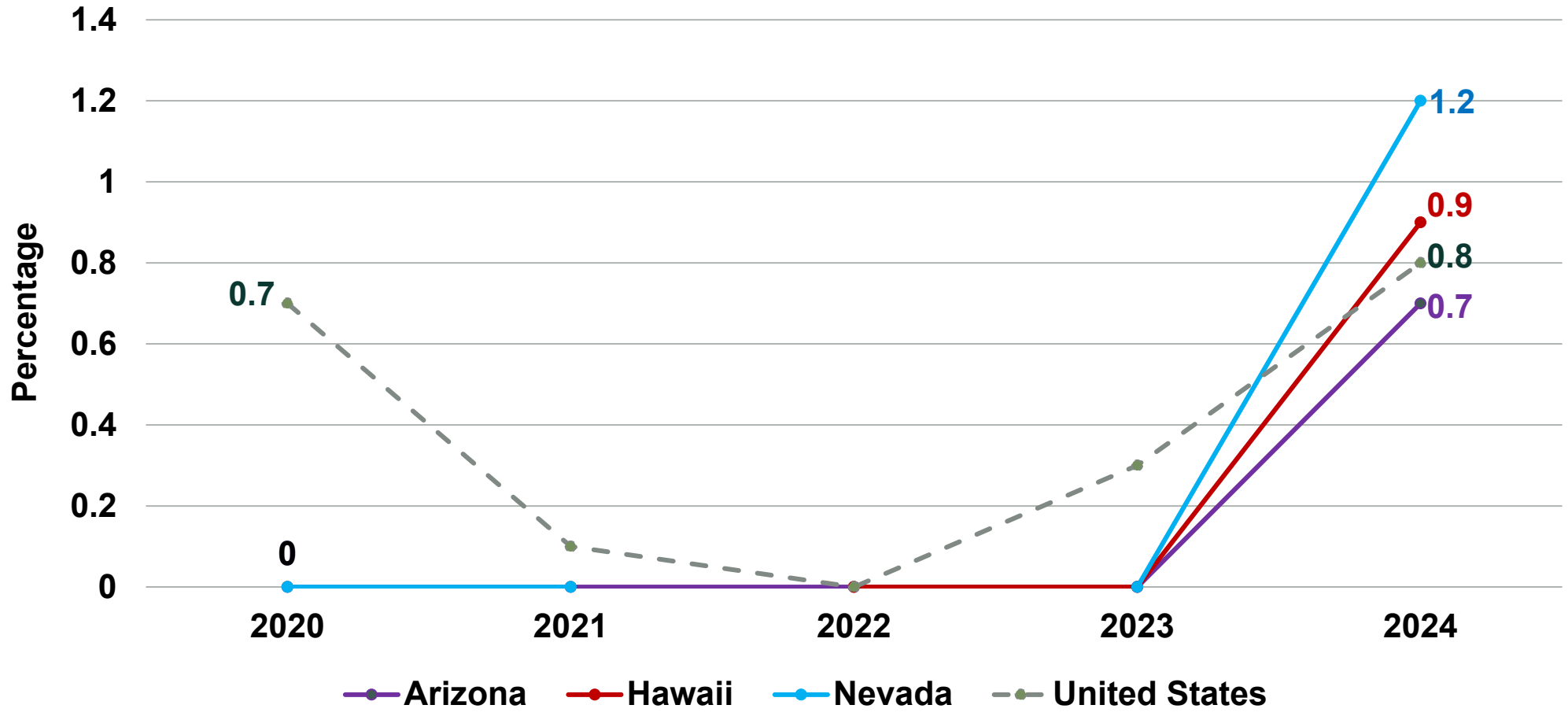
Fentanyl Analogs History

- Fentanyl created in Belgium in the 1950s[46]
- First analogs synthesized for illicit use in the 1970s-1980s[58]
  - The fentanyl commonly misused is illicitly manufactured, not diverted pharmaceutical fentanyl[4]
- Analogs appeared more widely in the U.S. illicit drug market in 2013 as adulterants of or replacements for heroin[57]
  - Use began increasing in parallel with fentanyl at this time[13]
- **+185%** increase in fentanyl analog drug trafficking cases since 2020[59]
- Though some have legitimate medical use, the HALT Fentanyl Act (2025) permanently classifies “fentanyl-related substances” as schedule I substances[13]

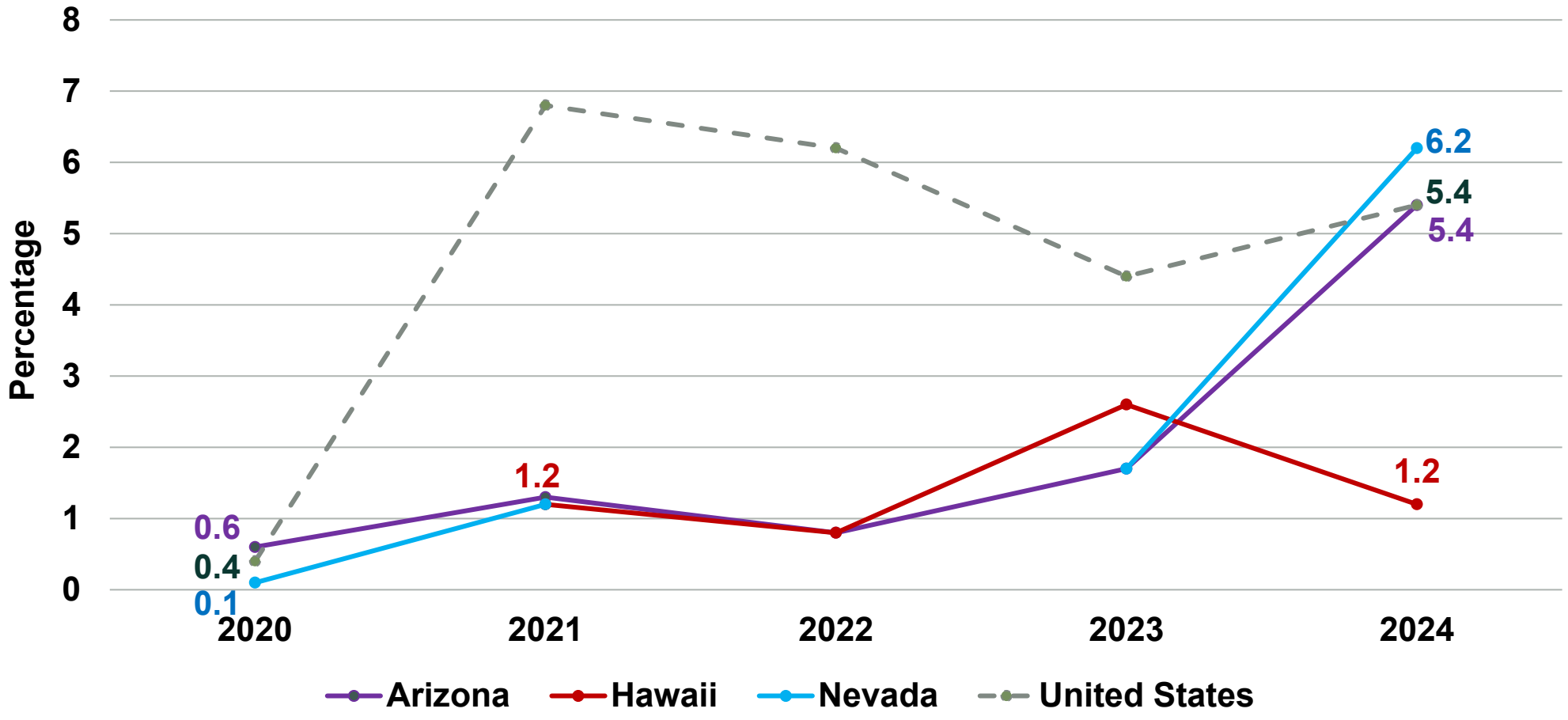
Fentanyl Analogs Consequences

- Since fentanyl analogs are so potent, even trace amounts can be fatal
- Around **70%** of overdose deaths in 2023 involved illicitly manufactured fentanyl and fentanyl analogs[57]
- Many people do not know they are using fentanyl/fentanyl analogs
  - **90%** of those who tested positive for fentanyl in an emergency department sample were not aware they were using fentanyl[52]
- Because they are opioids, overdoses caused by fentanyl analogs can be reversed using naloxone – but may require multiple doses due to their high potency

Percentage of Carfentanil Detected in Drug Overdose Deaths, 2020-2024[6]



Percentage of Para-fluorofentanyl Detected in Drug Overdose Deaths, 2020-2024[6]



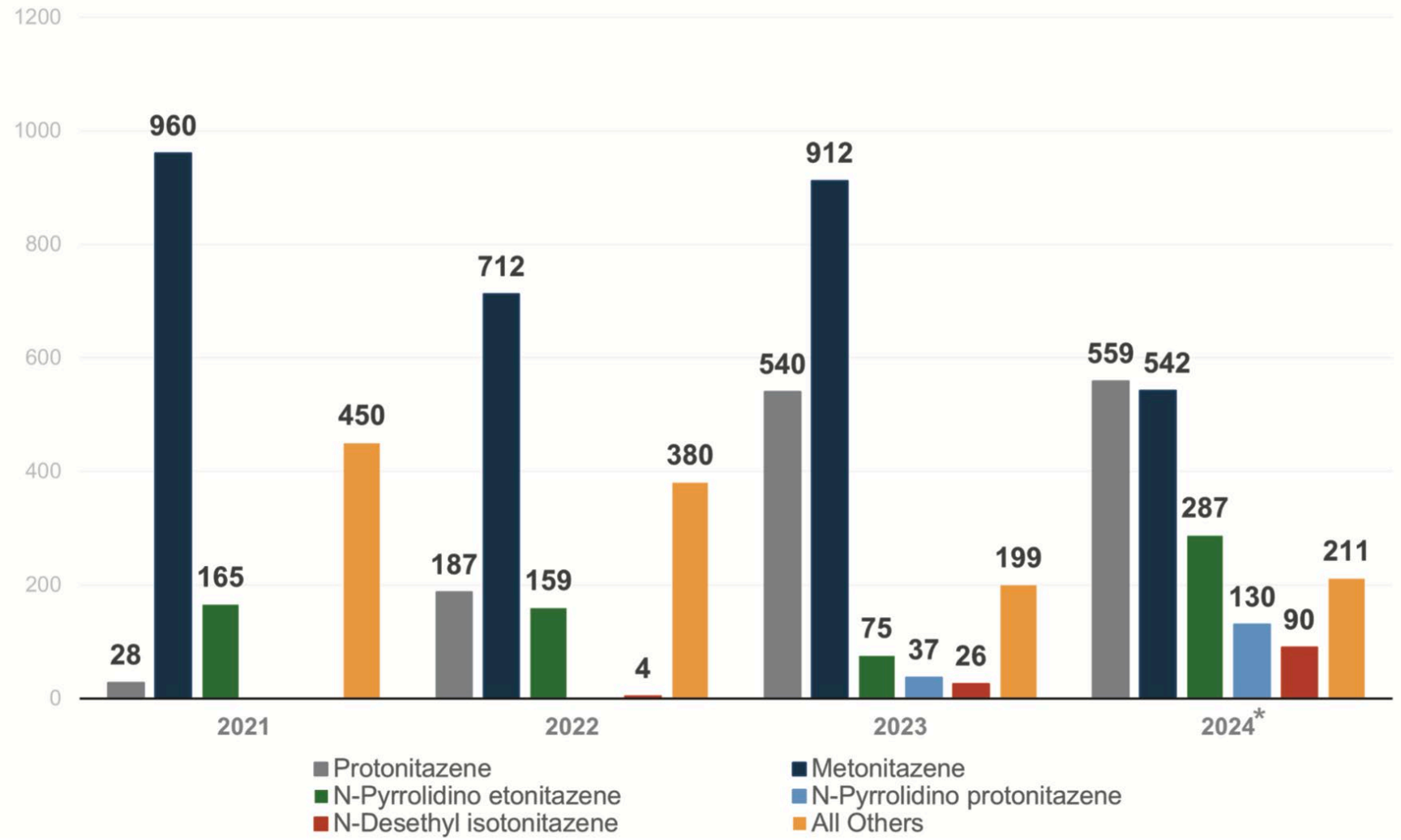
Nitazenes

- Synthetically engineered opioids intended to mimic the effects of traditional opioids[14]
- Sometimes known as “ISO” or “Toni”
- Some nitazenes are estimated to be up to **43 times** more potent than fentanyl[21]
- Commonly mixed into heroin or fentanyl, or falsely marketed as hydromorphone or oxycodone[21]
- Can be manufactured quickly and cheaply, making them attractive to illicit drug manufacturers[54]

Nitazenes History[21]

- First developed in the 1950s in Switzerland
- Not a regular part of the illicit drug market for many decades (save a few isolated incidents)
- Emerged more widely on the illicit drug market internationally and in the Midwest U.S. in 2019
- New nitazene analogs are constantly emerging – **at least 20** unique types of nitazenes have been identified
  - Most commonly: isotonitazine, metonitazine, and protonitazine
- Many nitazene analogs have been federally scheduled, but new, molecularly unique types regularly emerge that require distinct scheduling

NFLIS Encounters With Nitazenes, 2021-2024[12]



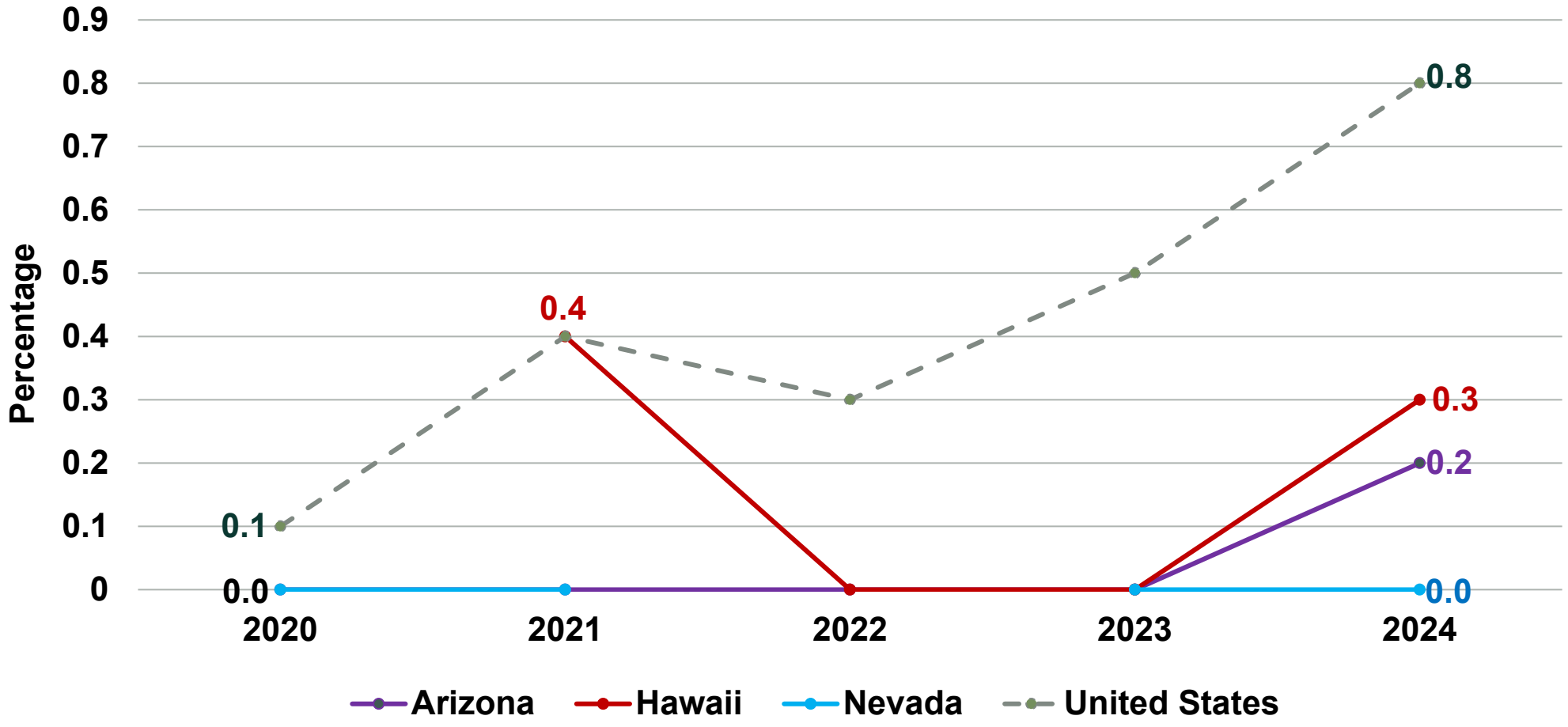
**2024 data is preliminary and subject to change*

Source: National Forensic Laboratory Information System, data retrieved April 10,2025

Nitazenes Consequences

- Nitazenes possess an especially high risk for overdose due to their potency
  - Multiple doses of naloxone may be required
- **Orange, CA** among top 10 U.S. counties with highest rates of EMS encounters for non-fatal nitazene-related overdoses from January 2024 to October 2025[42]
- Nitazenes can cause dizziness, nausea, confusion, vomiting, loss of consciousness, and seizures[21]
- Studies about nitazene dependence and withdrawal are limited, but long-term use can lead to dependence and withdrawal that has a high potential to be severe and painful[51]

Percentage of Nitazenes Detected in Drug Overdose Deaths, 2020-2024[6]



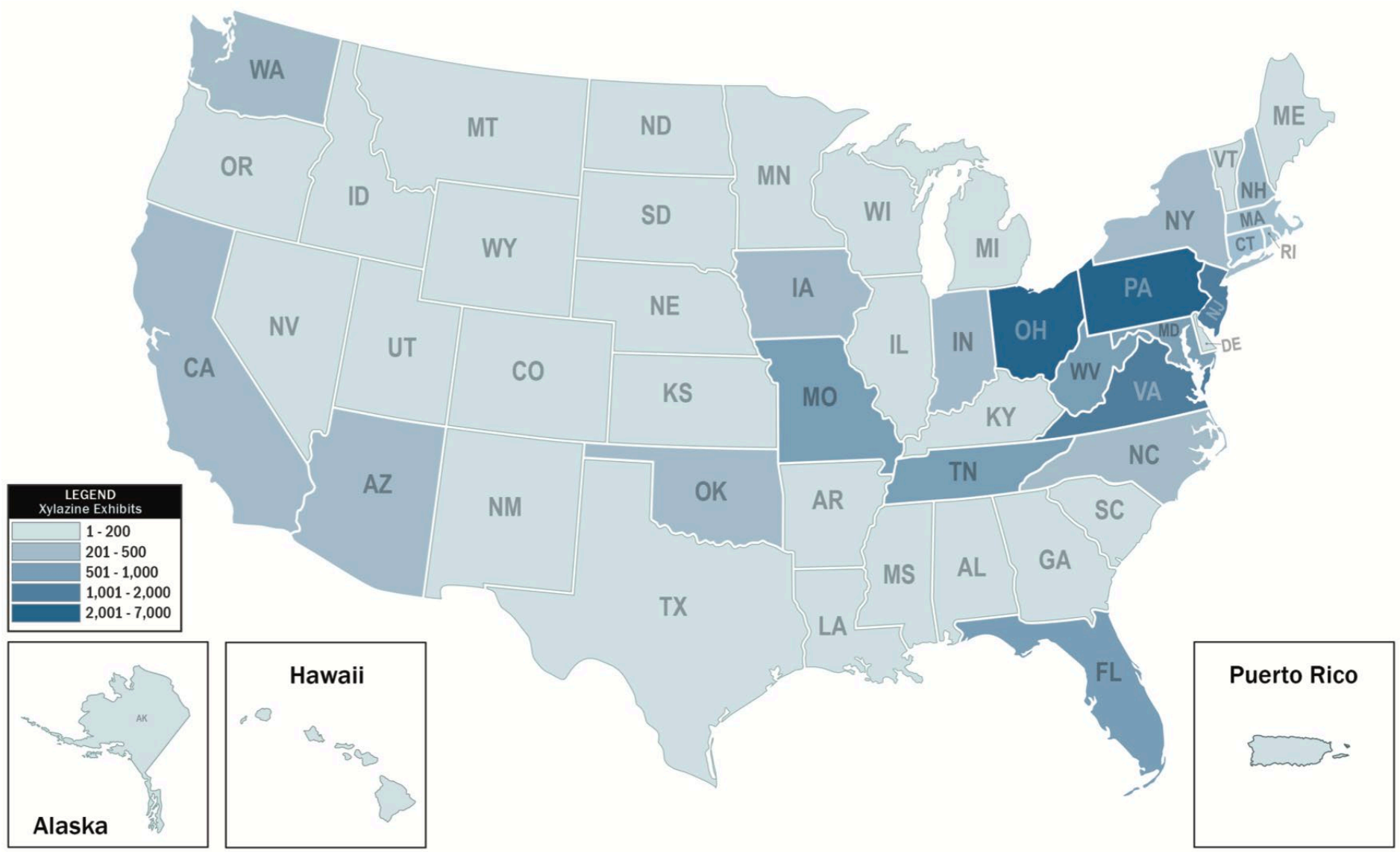
Xylazine

- Veterinary anesthetic not approved for human use[44]
- Non-opioid sedative, but chemically interacts with opioids[44]
- Also known as “zombie drug” or “tranq” due in part to how it extends and amplifies the effects of opioids[44]
- Has both intentional and unintentional use
- Detected in fentanyl samples and drug-involved overdose deaths in the Pacific Southwest region[2 27 30]
- Use appears to be declining in some regions in favor of other opioid adulterants[31]

History of Xylazine Misuse

- Originally identified in rural Puerto Rico in 2001[26]
- Spread to areas in mainland U.S. with large Puerto Rican populations in 2006 (especially Philadelphia and Connecticut)[26]
- Relatively isolated for years, but began rapidly spreading across the U.S. in 2019[26]
  - Most prevalent in the mid-Atlantic region of the US, but has spread to every state[33]
- FDA restricted unlawful imports of xylazine and chemicals used to produce it in February 2023[22]
- Though not currently federally scheduled, at least 7 states have scheduled xylazine[36]
  - Classified as a “dangerous drug” in AZ, allowing for penalties for possession/sale
  - Legislation introduced to classify xylazine as a schedule III substance in CA & HI

Xylazine Seizures, 2024[12]



Xylazine Consequences

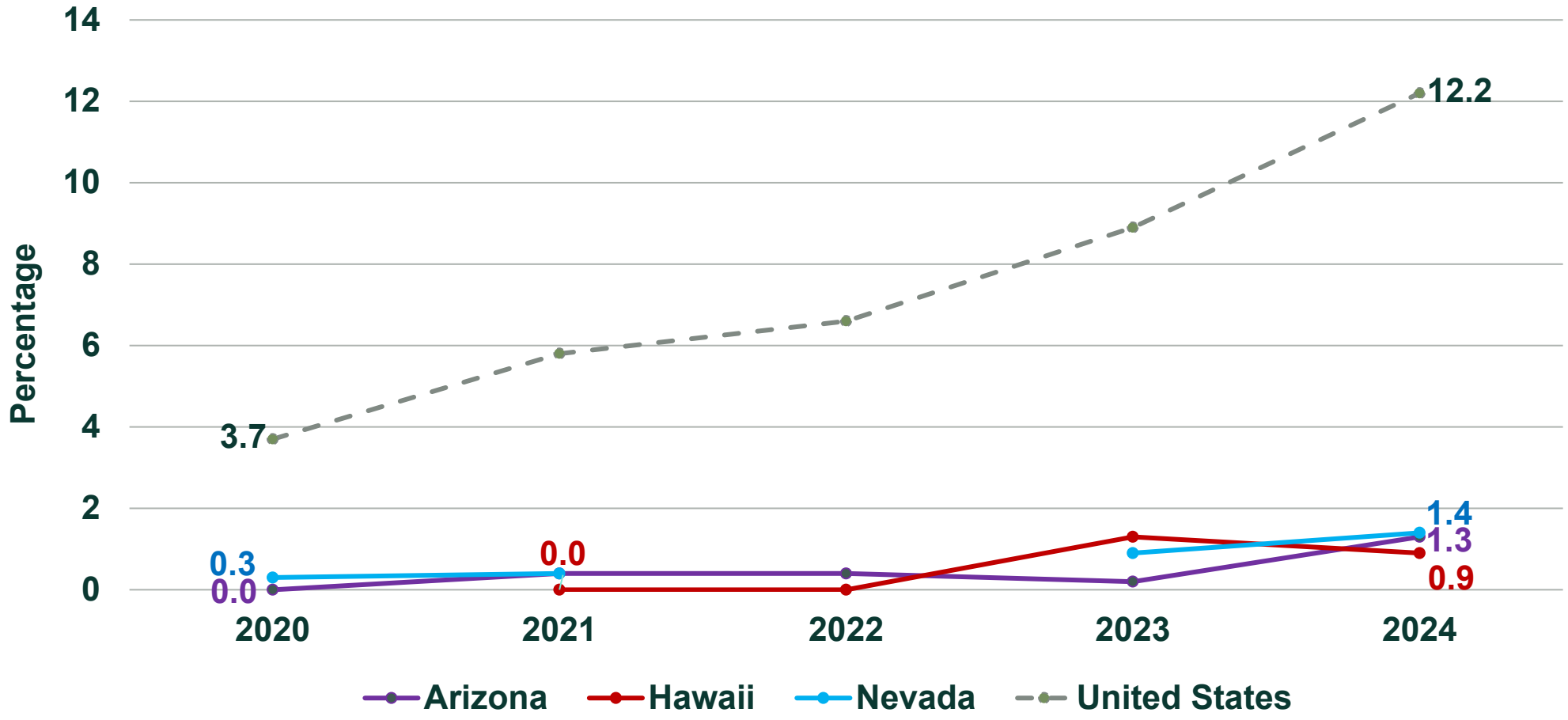
- Strong sedative effects intensify risk of overdose
  - Number of fatal overdoses co-involving fentanyl and xylazine increased from **99** in 2018 to **6,020** in 2023[62]
- Use can lead to soft tissue infections which cause serious skin ulcers, abscesses, and necrotic tissue development[20]
- Can cause drowsiness, memory loss, dangerously low breathing, disorientation, high blood sugar, and loss of physical sensation[20]
- Naloxone will not reverse the effects of xylazine because xylazine is not an opioid, but both drugs are frequently used together
- Treating xylazine use and related consequences presents new significant challenges for providers

Poll Question 2

How have you effectively communicated information about new trends or challenges to behavioral health colleagues at other organizations?

- Forwarding official health alerts or bulletins
- Forwarding news reports and other secondary coverage
- Forwarding academic research and government reports
- Releasing a mass email/newsletter blast
- Publishing your own report, alert, or formal statement
- Direct one-on-one emails or phone calls
- Speaking at recurring, organized events (e.g., monthly roundtables)
- Informal, in-person conversations
- Other (share in chat)
- Have not found effective communication methods

Percentage of Xylazine Detected in Drug Overdose Deaths, 2020-2024[6]



Medetomidine

- Veterinary sedative approved by for use with dogs but not for humans[39]
- Sometimes referred to as “rhino tranq,” “dex,” or “mede”[40]
- Often added to opioids (most commonly fentanyl) to enhance sedating effects[39]
- Medetomidine is **200-300 times** more powerful than xylazine[12]
  - Binds more powerfully to the same CNS receptors as xylazine
- Illicit medetomidine use is relatively new, and only infrequently detected in the Pacific Southwest region[39]

History of Medetomidine Use

- First identified in Maryland in July 2022, with use spreading sporadically throughout 2023 and 2024[34]
  - Early overdose events were in CO, **CA**, MD, MO, and PA
- Reports of medetomidine seizures to NFLIS spiked from **245** reports in 2023 to **2,276** in 2024[63]
- In Philadelphia, the epicenter of the xylazine crisis, medetomidine was found in **87%** of fentanyl samples by January 2025[16]
- No identified state or federal restrictions yet — Maryland is debating legislative action[48]

Spread of Medetomidine Across the US[63]

Figure 4A. Medetomidine in 2021

Figure 4B. Medetomidine in 2022

Figure 4C. Medetomidine in 2023

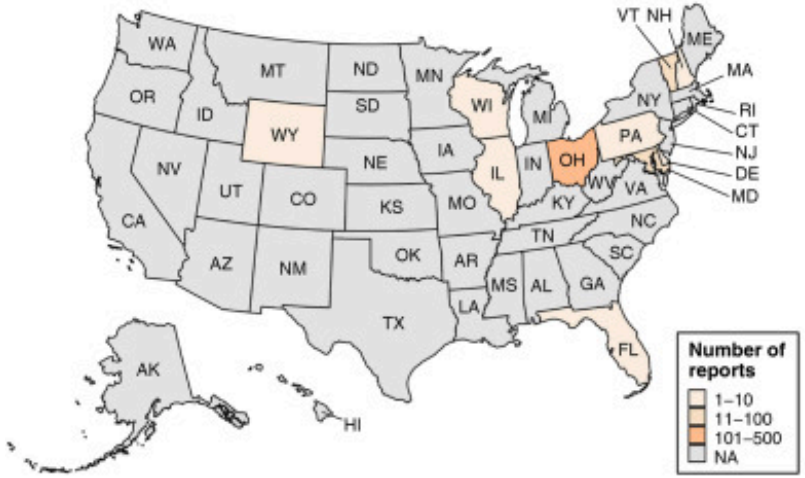
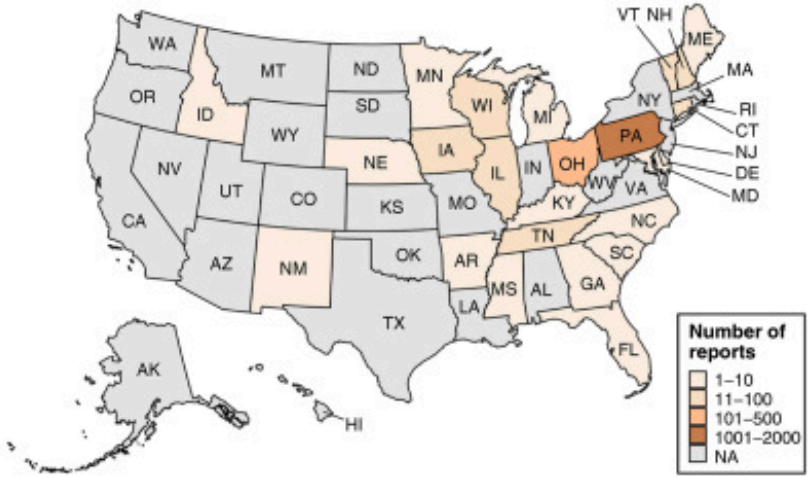


Figure 4D. Medetomidine in 2024



Medetomidine Consequences

- Overdoses cause severe drops in heart rate and blood pressure[45]
- Intractable vomiting is common
  - A 2024 study reported **24%** of ICU patients in medetomidine withdrawal required intubation[32]
- Medetomidine is in the same drug class as xylazine but is not as potent of a vasoconstrictor, so tissue damage is less of a concern[10]
- Withdrawal can cause severe hypertension and tachycardia that can result in permanent heart and brain damage[32]
  - Dexmedetomidine is used to treat medetomidine and xylazine withdrawals

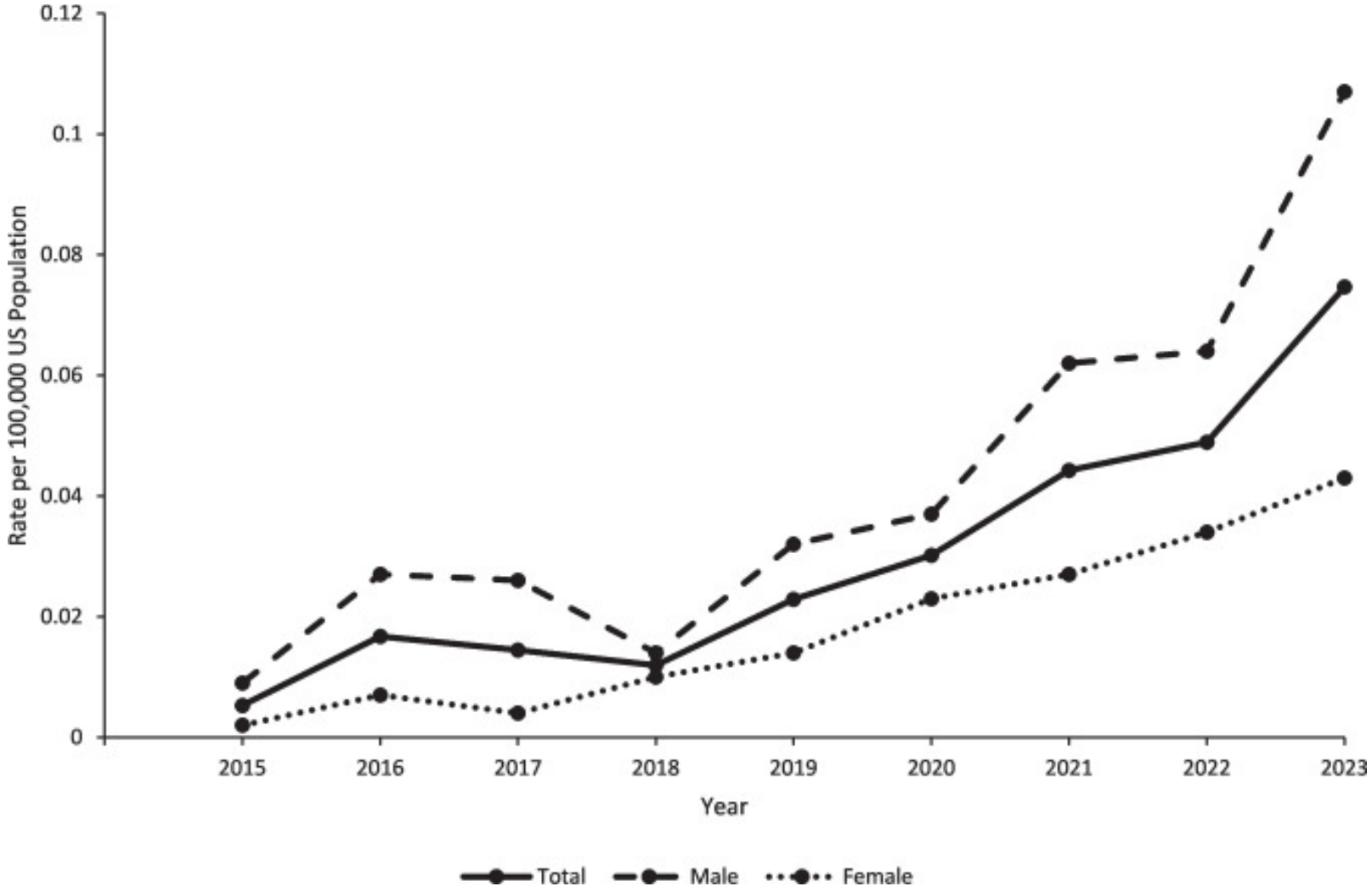
Tianeptine

- Drug approved for treatment of anxiety and major depressive disorder in other countries, but not approved for any medical use in the U.S.[25]
- Known as “gas station heroin” because it’s widely available for purchase from gas stations, smoke shops, and over the internet[8]
  - Sold under brand names Pegasus, Neptune’s Fix, Tianaa Red, and Zaza
  - Often packaged in colorful shot-sized bottles or pills
- Bonds to opioid receptors in the brain and mimics the effects of heroin in high doses[53]

Tianeptine History

- Discovered in France in the 1960's[53] and introduced for medical use in 1983[8]
  - Legitimate medical use spread across Europe through the 80's and 90's
- In 2012, France recognized that tianeptine does not function like other antidepressants and had potential for misuse[8]
  - Became subject to tighter narcotics restrictions Some other countries then also began restricting or outright banning use[60]
- Only 11 calls for tianeptine exposure reported to America's Poison Centers from 2000-2013 – began to increase significantly in 2014[12]
- As of December 2025, tianeptine is a Schedule 1 substance in 14 states (including NV)[38]
  - Legislation has been proposed but not enacted in CA

Annual Rate of Tianeptine Exposures Reported to US Poison Centers, 2015-2023[49]



Tianeptine Consequences

- Because of the opioid agonist effects, tianeptine use presents a significant risk for dependence and fatal overdose[41]
- Most tianeptine exposures reported to poison centers were associated with moderate or major side effects[49]
  - **40.1%** required medical admission, including **22.9%** to a critical care unit
- Some studies have found that tianeptine use increases risk of psychosis and suicide[19]
- Tianeptine use can cause confusion, nausea, tachycardia, hypertension, respiratory depression, and coma[25]

Discussion Question 2

Tianeptine use is still legal, including for youth, at the federal level and in most states. How can we spread awareness of the need to address substances or trends when no laws or regulations are being violated?

Kratom

- Tree native to S.E. Asia traditionally used in rural homeopathic medicine but not approved for medical use in the U.S.[11]
- Sometimes referred to as “thang,” “kakuam,” “thom,” “ketum,” or “biak”[15]
- Produces stimulant effects in low doses and sedative effects in high doses[15]
- Widely available for purchase online and at tobacco/smoke shops[15]
  - Marketed as an herbal supplement or a “natural” high
  - Sold as liquids, powders, pills, and gummies
- Some use kratom to self-treat opioid use disorder and withdrawal[24]

Kratom History

- Has been ingested since at least the 19th century in S.E. Asia, likely far earlier[28 35]
- First introduced in the U.S. after the Vietnam War, but use was minimal[28]
- Cases emerged in the early 2000s describing kratom for self-treatment of opioid withdrawal symptoms and pain[28]
- CDC reported an increase in kratom-related calls to poison control centers beginning in the mid-2010s[28]
- Reliable data on current kratom use is hard to find
  - **0.6%** of ages 12+ reported past-year kratom use in 2023 NSDUH
  - Some studies have reported lifetime kratom use as high as **9.1%**[29]
- 7-OH (a psychoactive ingredient in kratom) is now rapidly emerging

Kratom Regulation

- Kratom contains 2 main psychoactive ingredients: mitragynine and **7-hydroxymytragynine (7-OH)**, a potent opioid receptor agonist[18]
- 7-OH makes up less than 2% of the alkaloid content in natural kratom leaves[23]
- But the concentration of 7-OH is drastically increasing in many kratom products currently available for purchase[50]
- The FDA announced plans to classify 7-OH as a controlled substance in July 2025, but not natural kratom leaf products[23]
- Kratom is currently regulated in 25 states & DC[37]
  - AZ was an early adopter of kratom regulations
  - CA has recently began regulating kratom
  - NV has approved the Kratom Consumer Protection Act

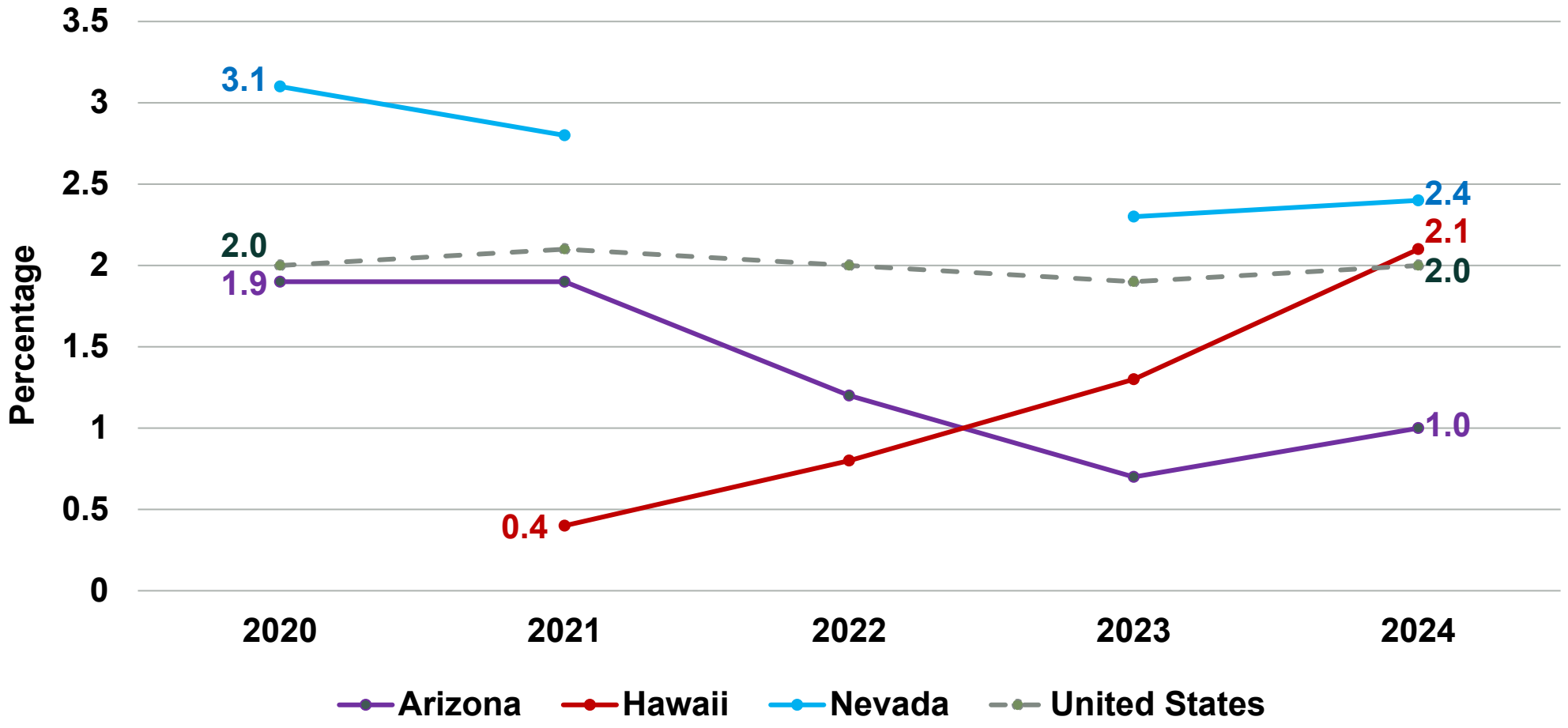
Discussion Question 3

What efforts to regulate kratom and/or 7-OH are happening in your community?

Kratom Consequences

- Death from kratom alone is rare – most often occurs in combination with other substances[43]
- Kratom accounted for **1,489** case mentions to America's Poison Centers in 2023[15]
  - **671** cases involved treatment in a healthcare facility; **5** resulted in death
- Can be addictive and has been found to induce psychosis[1 9]
- Use may result in nausea, tachycardia, confusion, liver problems, and seizures[7]

Percentage of Kratom Detected in Drug Overdose Deaths, 2020-2024[6]



Opportunities to Address Novel Substances

Overdose Prevention

- Increase access to medications for opioid use disorder (MOUD)
- Ensure post-overdose follow-up and connection to services
- Investigate novel naloxone access (e.g., naloxone vending machines)
- Raise awareness about the importance of administering naloxone in xylazine and medetomidine overdoses due to frequent co-involvement with fentanyl
- Educate on the need for multiple doses of naloxone for overdoses involving nitazenes and fentanyl analogs due to their high potency
- Confirm tianeptine overdoses can be reversed with naloxone

Epidemiological Surveillance

- Include emerging drugs in routine clinical toxicology testing
- Support enhancement of community drug checking technologies/systems
- Expand community access to test strips
- Increase data-sharing capabilities
- Create formal or informal early-warning networks
- Educate on effective uses of prescription drug monitoring program (PDMP) data

Raising Awareness

- Work with law enforcement partners to facilitate training on emergency responses to novel substances
- Expand the role of peer support groups and identify peers with lived experience with novel substances
  - E.g., someone who recovered from xylazine wounds
- Inform the public of emerging trend and novel substance risks through public communications campaigns
- Raise awareness of novel substances among policymakers

Policy Changes

- Advocate for closer cooperation with foreign countries to reduce supply of novel substances
- Assess the potential effectiveness of banning or scheduling novel substances
- Design policies in ways that don't prevent legitimate use of some substances
- Investigate existing policies on other substances to ensure they are not leading to people substituting with novel substances
- Encourage development of policies to expand epidemiological surveillance
  - E.g., ensuring drug testing equipment does not count as drug paraphernalia
- Pursue policy changes to address non-medical drivers of health

Continue to Do What Works

- Embed novel substances into existing community prevention policies and practices
  - Leverage existing programs, partners, and infrastructure rather than creating new siloed systems
- Need to address the underlying causes of substance use, not just the “whack-a-mole” the latest novel substance
  - Seme of the same risk and protective factors for traditional substances still apply (e.g., poverty, resilience)
- Use data on emerging trends and novel substances to adapt existing evidence-based strategies when possible

Discussion Question 4

Are there other strategies that have been effective at curbing opioid misuse in your community?

Conclusion

- The opioid epidemic has undergone several different waves, with the most recent representing a decline in overdoses and a shift towards novel emerging substances
- Fentanyl analogs, xylazine, medetomidine, nitazenes, tianeptine, and kratom are all in the illicit drug supply to some extent in the Pacific Southwest region
- These novel substances are all stronger than fentanyl and pose significant risk of serious harms – especially fatal overdose
- There are few substance-specific evidence-based interventions to address novel substances; but adapting existing successful opioid prevention efforts can make a difference

Join us for Upcoming Webinars in the Pacific Southwest Emerging Trends Series!

- Part 3: Other Emerging Trends and Novel Substances
  - April 9, 2026
- Part 4: The Latest Trends Among Established Substances
  - May 14, 2026

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References, I

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