

The Poison Center Landscape During the Continuing Opioid Crisis

Problems You Might Not Consider

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Plus, a Brief Interview with:

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Clinical Toxicologist, Colorado
(also, a Paramedic and Police Officer)



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Objectives:

- Describe current trends in Opioid Poisoning in Adults and Children **with additional information on cannabis**
- Discuss reasons opioid use disorder patients use stimulants
- Review polysubstance use and associated concerns
- Discuss problems with medications used to manage opioid addiction, including naloxone and buprenorphine



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Disclosures:

- Neither Dr. Simone nor Dr. Palmer have any actual or potential conflict of interest in relation to this presentation



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Northern New England Poison Center Overview

- Certified by the American Association of Poison Control Centers (AAPCC)
 - Staff
 - Hotline
 - Outreach
 - Surveillance
 - Research



Maine Public picture by Patty White



Funding: Maine Medical Center/MainHealth; University of Vermont; States of Maine, New Hampshire and Vermont; Health Resources and Services Administration

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Call, Chat or Text POISON to 85511

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Examples of Calls:

- My 2-year-old ate the ADHD medications I left out for her sister . . .
- My 79-year-old mother took the THC gummy I gave her and I think it is interacting with her blood pressure medication . . .
- My dog ate some of the box my naloxone came in and I think he may have gotten some of the naloxone too. . .
- I took some buprenorphine my friend gave me and now I feel jittery and like I am going to vomit . . .
- I think the new guy at work ate marijuana brownies someone brought in during break and is giggling a lot – he operates heavy machinery . . .
- My patient's urine is positive for methamphetamine, I was wondering if that can be from the Adderall I am prescribing . . .



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Paracelsus:

“All things are poisons, for there is nothing without poisonous qualities. It is only the dose that makes the poison.”

Alchemist, physician, astrologer



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Pediatric Poisoning

Crossover with Substance Use



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**What is
common:**

Substances Involved in General Unintentional Exposures

Ages 0-5 Years, All Caller Sites (n = 3,409)

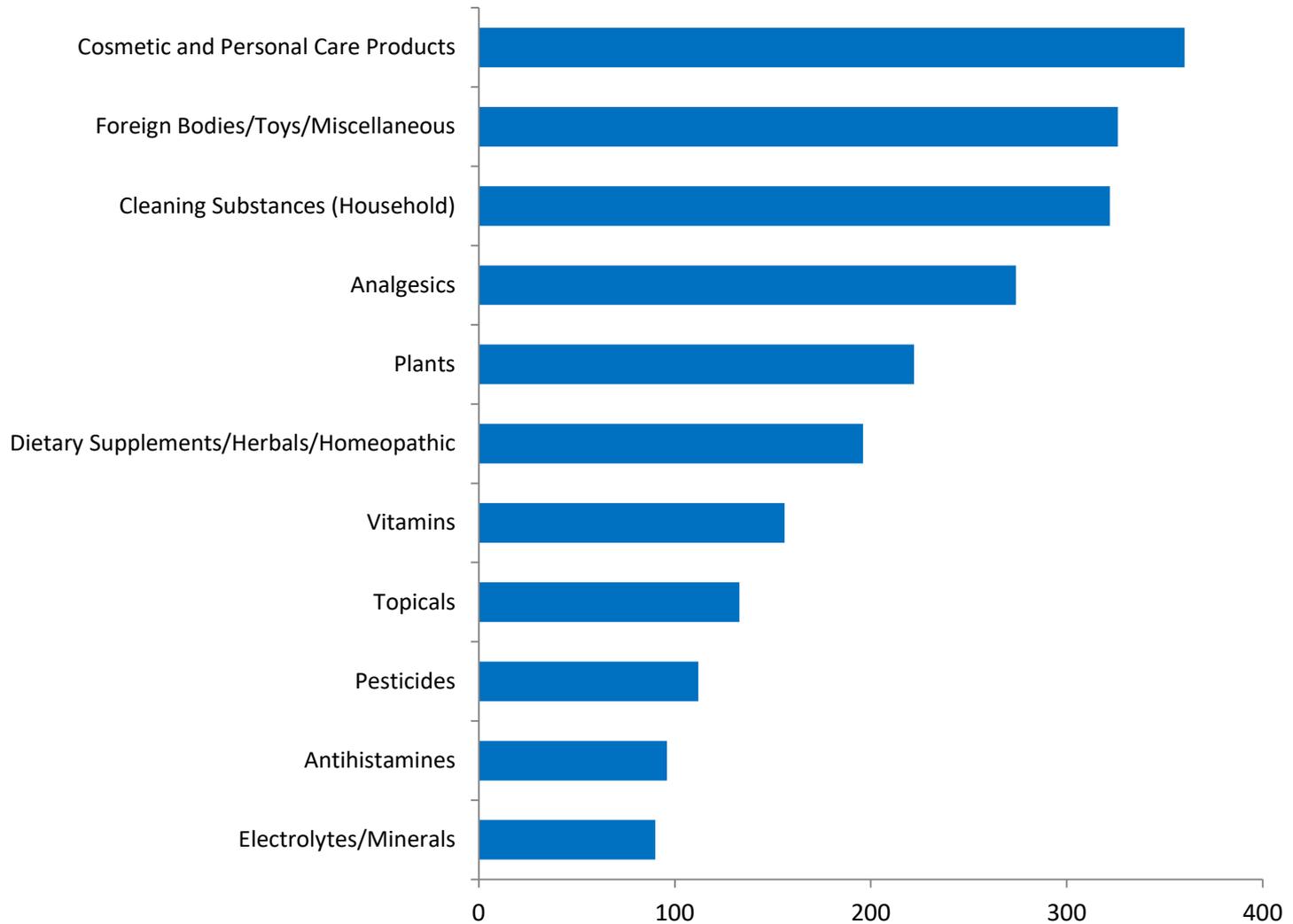


Chart shows all substance categories involved in 90 or more general unintentional exposures among children 5 years old and younger, accounting for 67% of the substances involved in such exposures



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State of Maine: July 2022 – June 2023

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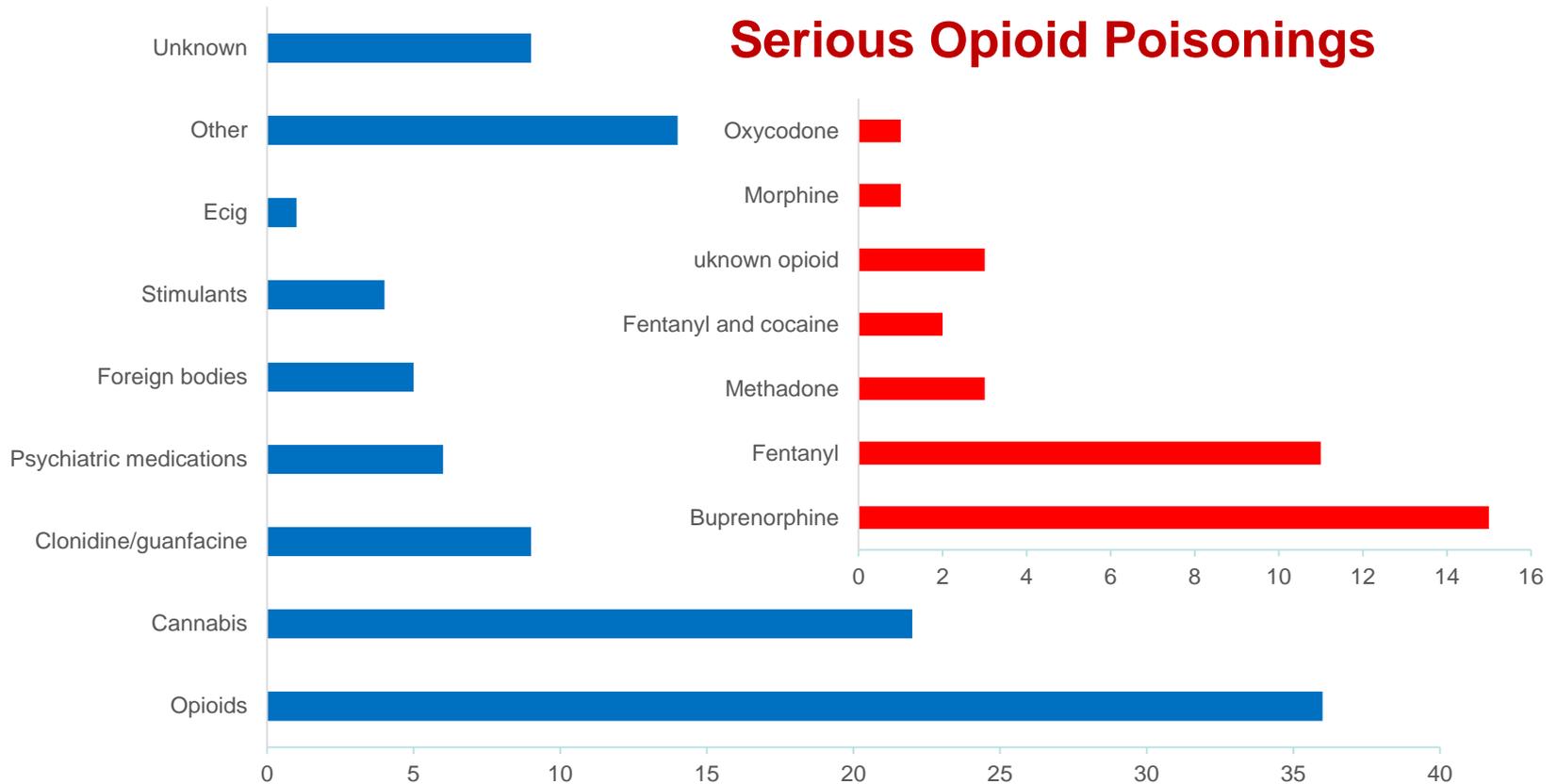
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What is serious:

Serious* Poisonings, 5 years and younger

Northern New England Poison Center (ME, NH, VT)
January 2018 - October 2023
N=106

Serious Opioid Poisonings



*Serious = Deaths and Near-deaths



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Pediatric Opioid Poisoning



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Buprenorphine Poisonings in Children

Retrospective Cohort Study, N = 88

- **Vomiting:** 45%
 - **Small pupils:** 77%
 - **Drowsy:** 80%
 - **Not breathing well:** 83%
 - **Note getting enough oxygen:** 28%
 - **Requiring ICU admission:** 41%
 - **Requiring naloxone:** 41%
- Onset of Resp Dep:**
Just under 2 hrs to
just over 8 hrs
(most)
- Death:**
Rare, but reported

Toce MS, et. al. Clinical effects of unintentional pediatric buprenorphine exposure at a single tertiary care center. *Clinical Toxicology*. 2017;44(1):12-17.



Kim HK, et.al. Buprenorphine may not be as safe as you think: a pediatric fatality from unintentional exposure. *Pediatrics*. 2012;130(6):p.e1700-1703.

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Opioid Poisonings in Children < 6 years

RADARS Poison Center Data from 2010 - 2018

48,560 poisonings, **28 deaths** (some with >1 opioid)

- **Buprenorphine:** 5 deaths, 0.84 poisonings/10,000 RX
- **Methadone:** 16 deaths, 0.73 poisonings/10,000 RX
- **Tramadol:** 1 deaths, 0.35 poisonings/10,000 RX
- **Morphine:** 2 deaths, 0.34 poisonings/10,000 RX
- **Oxycodone:** 5 deaths, 0.26 poisonings/10,000 RX
- **Hydrocodone:** 1 deaths, 0.19 poisonings/10,000 RX



Wang GS, et.al. The impact of the prescription opioid epidemic on young children: Trends and mortality. Drug and Alcohol Dependence. 2020;2011: p.107924

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Opioid Poisonings in Children < 6 years

RADARS Poison Center Data from 2010 - 2018
48,560 poisonings, 28 deaths (some with >1 opioid)

- **Deaths:**

- Supervision by someone other than the parent (28.6%)
- Ingestions witnessed/suspected - medical treatment not sought (39.2%)
- 1 buprenorphine and 1 methadone death – sent home from ED too soon
- 2 methadone deaths caused by use to sedate a child
- 1 tenfold dosing error in hospice care

- **Access:** drugs often not stored safely



Wang GS, et.al. The impact of the prescription opioid epidemic on young children: Trends and mortality. Drug and Alcohol Dependence. 2020;2011: p.107924

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Opioids in Small Children

Prevention

- Educate parents regarding the seriousness of poisoning in small children
- Keep locked and out of sight and reach (always)
- Access often occurs when:
 - Bottles/containers/dispensers are within reach
 - Pills spill
 - Purses are within reach
 - Film packets are opened
 - Films are cut and part is left within reach
 - Parent is “high,” supervision is inadequate

**Hope for
engineering
controls and smart
decisions
(packaging, taste,
flow)**



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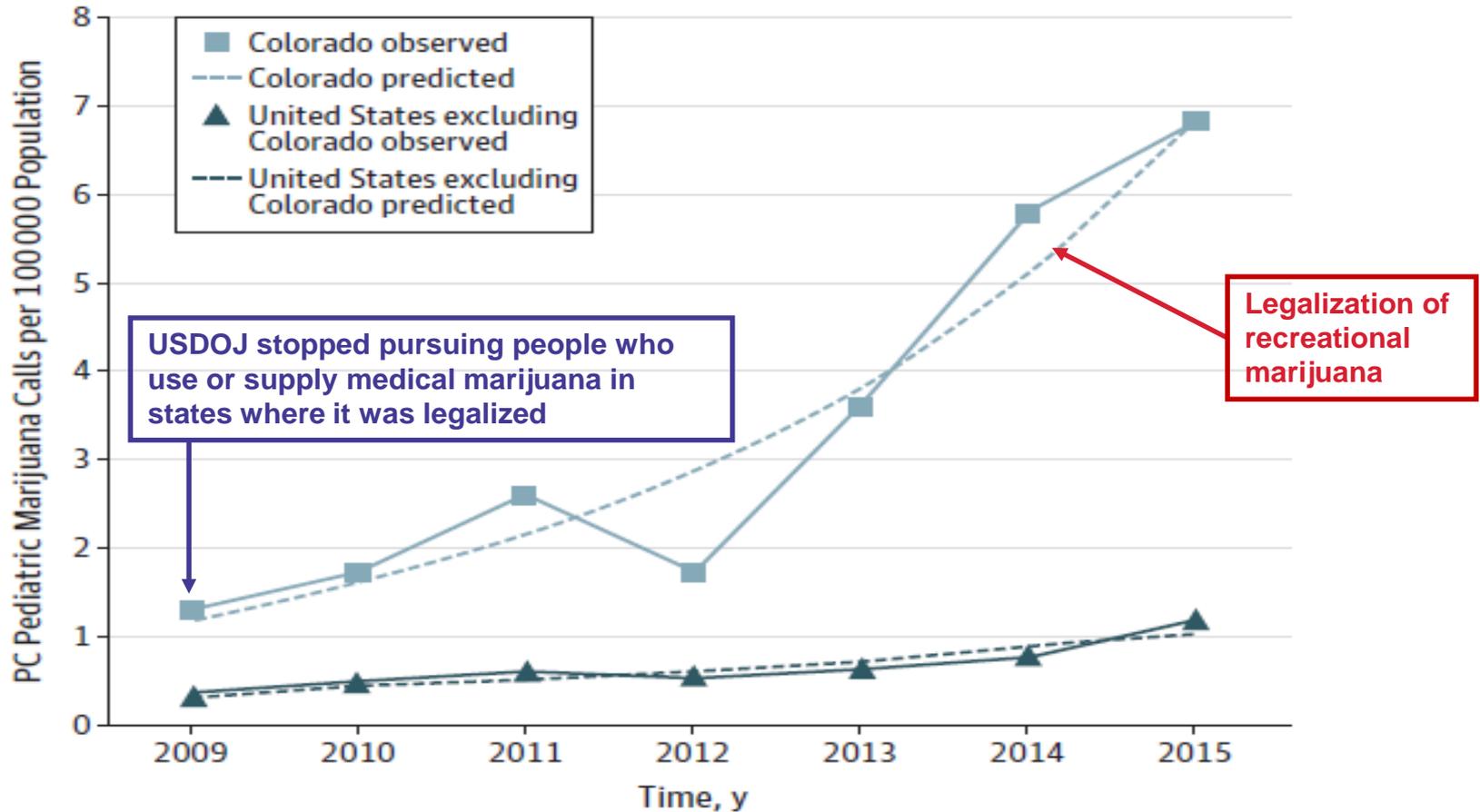
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Pediatric Cannabis Poisoning



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Colorado Cannabis Pediatric Exposures



Wang GS et. al. Unintentional pediatric exposures to marijuana in Colorado, 2009 – 2015. JAMA Pediatr. 2016;170(9).

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Pediatric Poisoning Study (N=163)

Clinical effects:

- Drowsiness/lethargy (49%)
- Dizziness, lack of coordination/muscle control (12%)
- Agitation (8%)
- Rapid heart rate (6%)
- Vomiting (5%)
- Seizures (3%)
- Dystonia/muscle rigidity (2%)
- Inadequate breathing (2%)
- Slow heart rate/low blood pressure (2%)

Note: A single patient may have multiple clinical effects.



Wang GS et. al. Unintentional pediatric exposures to marijuana in Colorado, 2009 – 2015. JAMA Pediatr. 2016;170(9).

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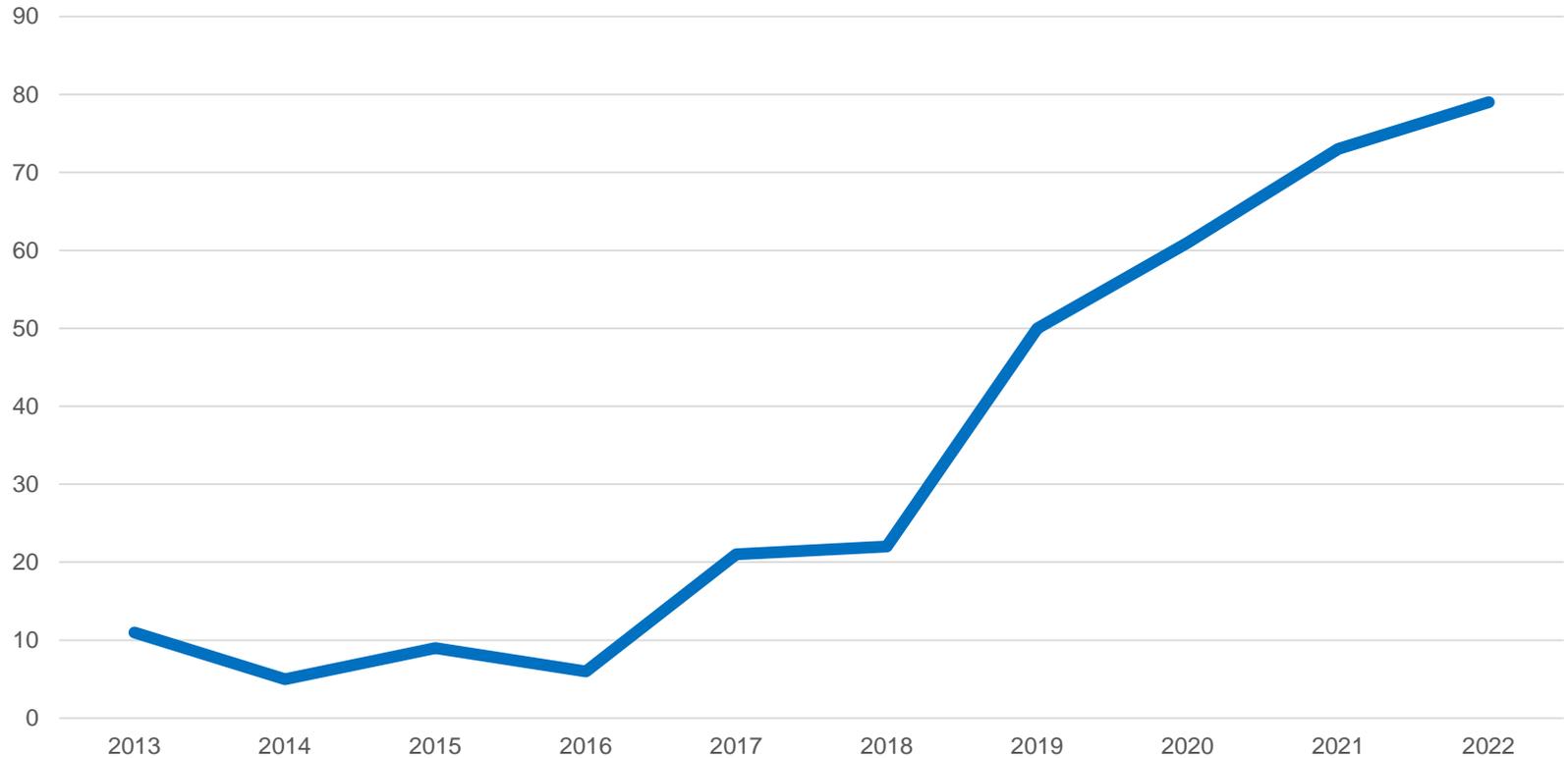
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Pediatric Cannabis Poisonings by Year

Northern New England Poison Center (ME, NH, VT)

Less than 6 years of age



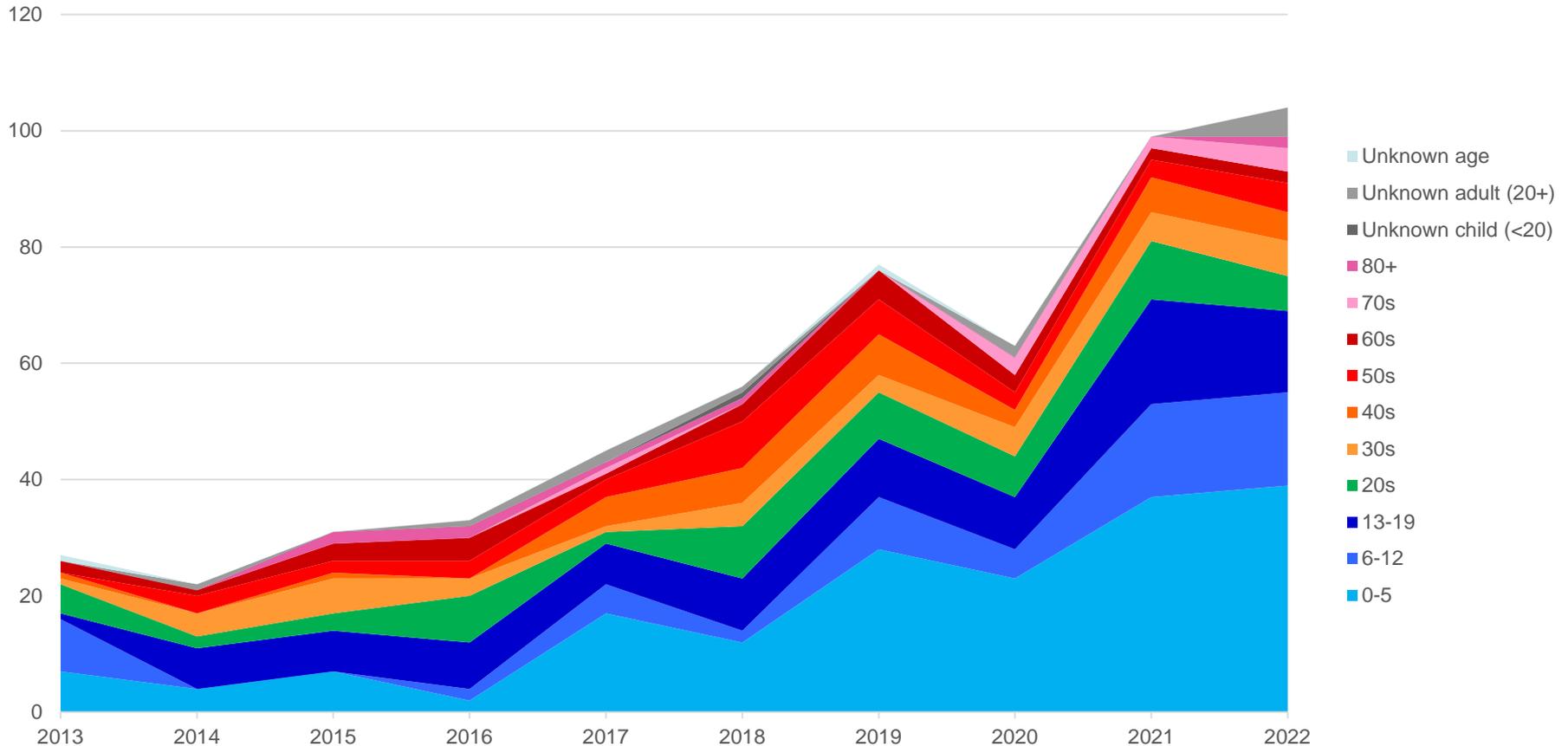
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Human Cannabis Poisonings by Age in Maine

Northern New England Poison Center Data

N = 557



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Edibles

Non-Marijuana Product	Marijuana Product	Total THC content (mg)
		200
		20
		25
		10/slice 500/pkg



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Wang GS, Simone KE, Palmer RB. Description of Edible Marijuana Products, Potency Ranges and Similarity to Mainstream Foods. Clin Toxicol 2014; 52: 805 (abstract)

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Edibles

Non-Marijuana Product	Marijuana Product	Total THC content (mg)
		200
		200
		320
		100



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Wang GS, Simone KE, Palmer RB. Description of Edible Marijuana Products, Potency Ranges and Similarity to Mainstream Foods. Clin Toxicol 2014; 52: 805 (abstract)

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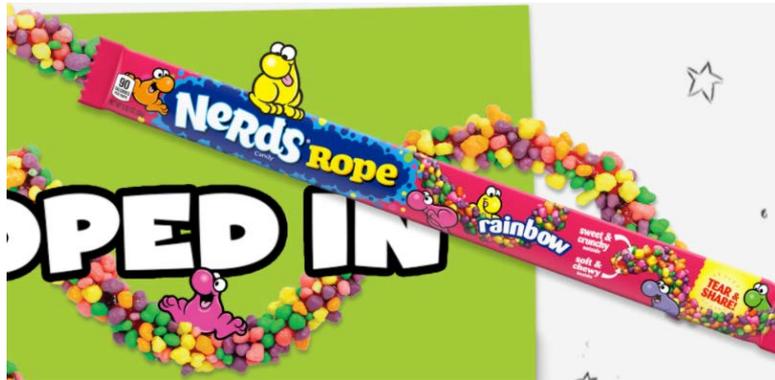
Problems with Gummies



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Problems with Crunchy Nerds



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Cannabis in Small Children

Prevention

- **Do not store near other food, candy or medicine**
- **Keep it locked and out of sight and reach**
- **Do not allow children to see it put away or used**
- **Consider purses, visitors (including babysitters)**
- **Beware of block parties, weddings and schools**



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Child-resistant containers

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The Stimulant Problem in Adults

Especially those with Opioid Use Disorder



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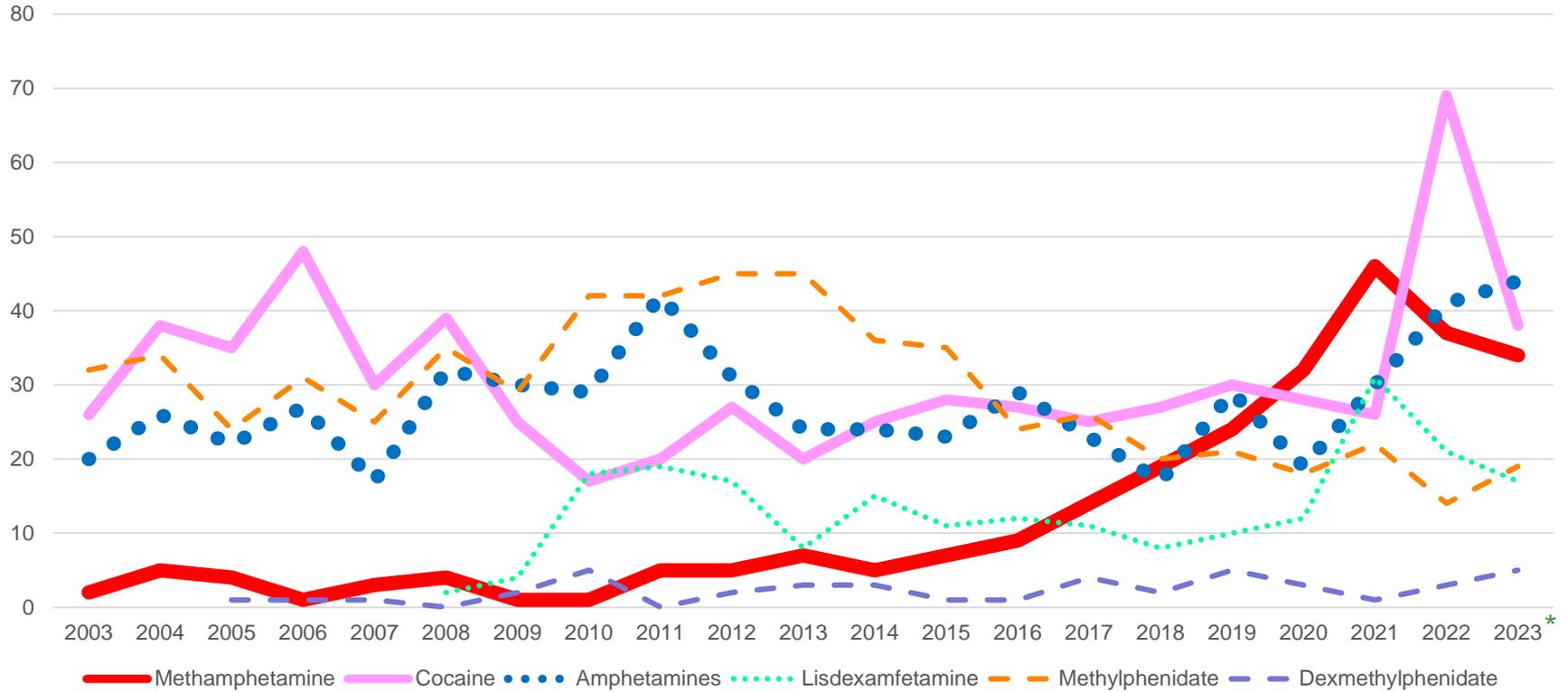
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Stimulant Exposures in Adults 20 Years and Older in Maine

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Substances Involved



*2023 through October 31



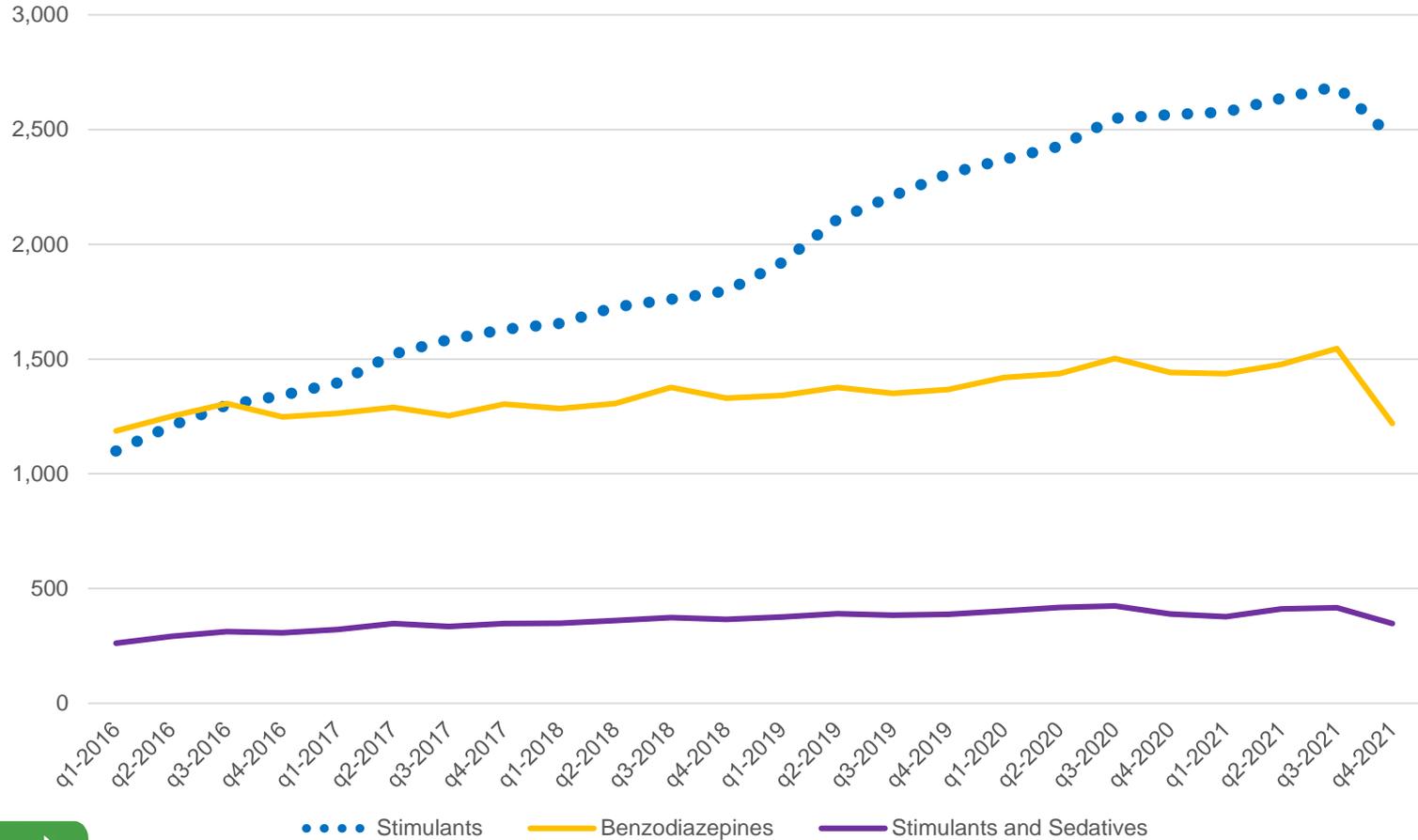
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Prescription Drug Monitoring Program

Potentially Addicting Medications Co-prescribed with Buprenorphine

Number of Patient per Quarter in Maine



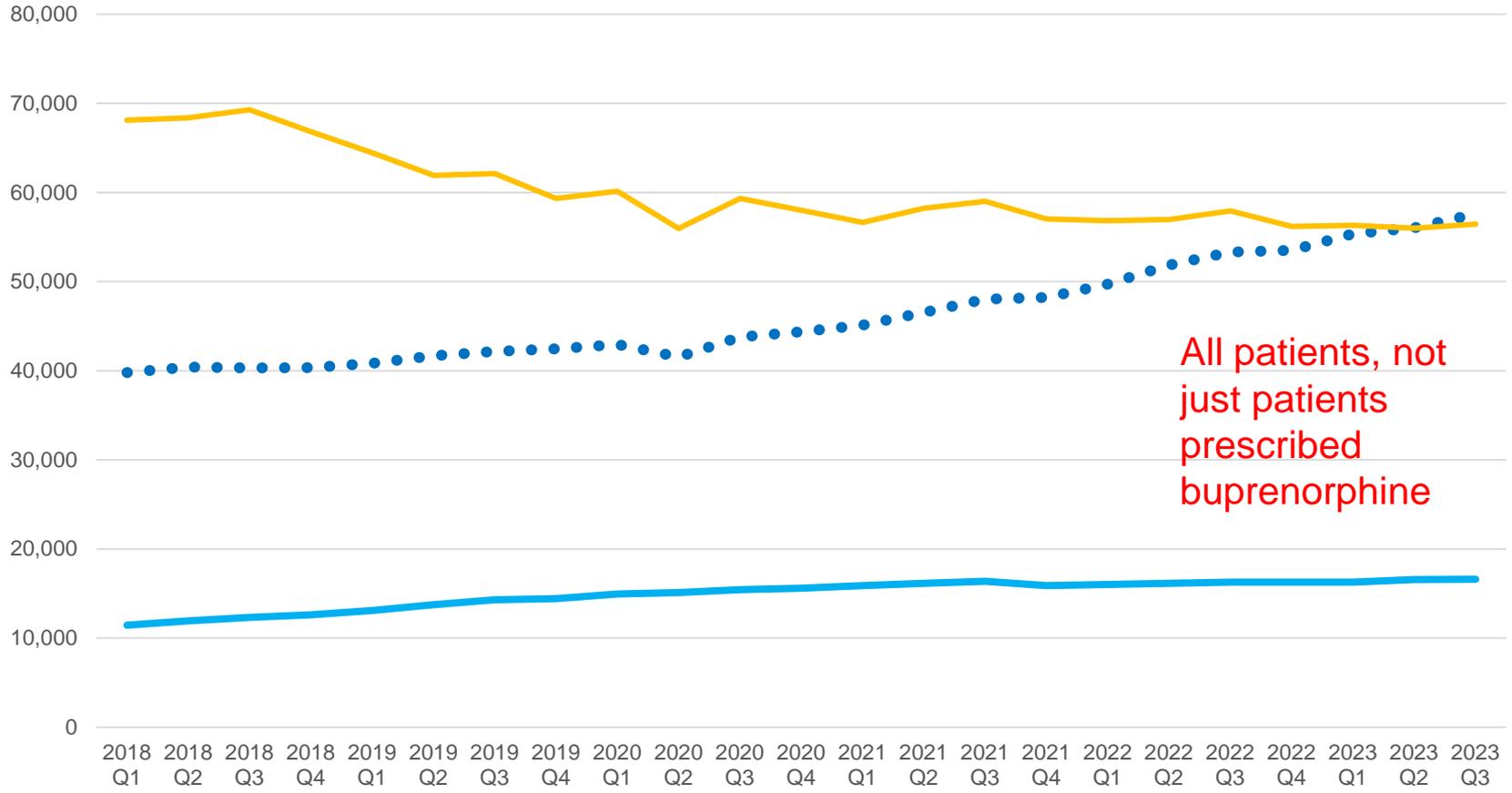
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Prescription Drug Monitoring Program

Potentially Addicting Medications

Number of Patients per Quarter in Maine



All patients, not just patients prescribed buprenorphine

•••• Stimulants — Buprenorphine — Benzodiazepines



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Figure 4. Number of deaths caused by cocaine and by methamphetamine, alone or in combination with other drugs.

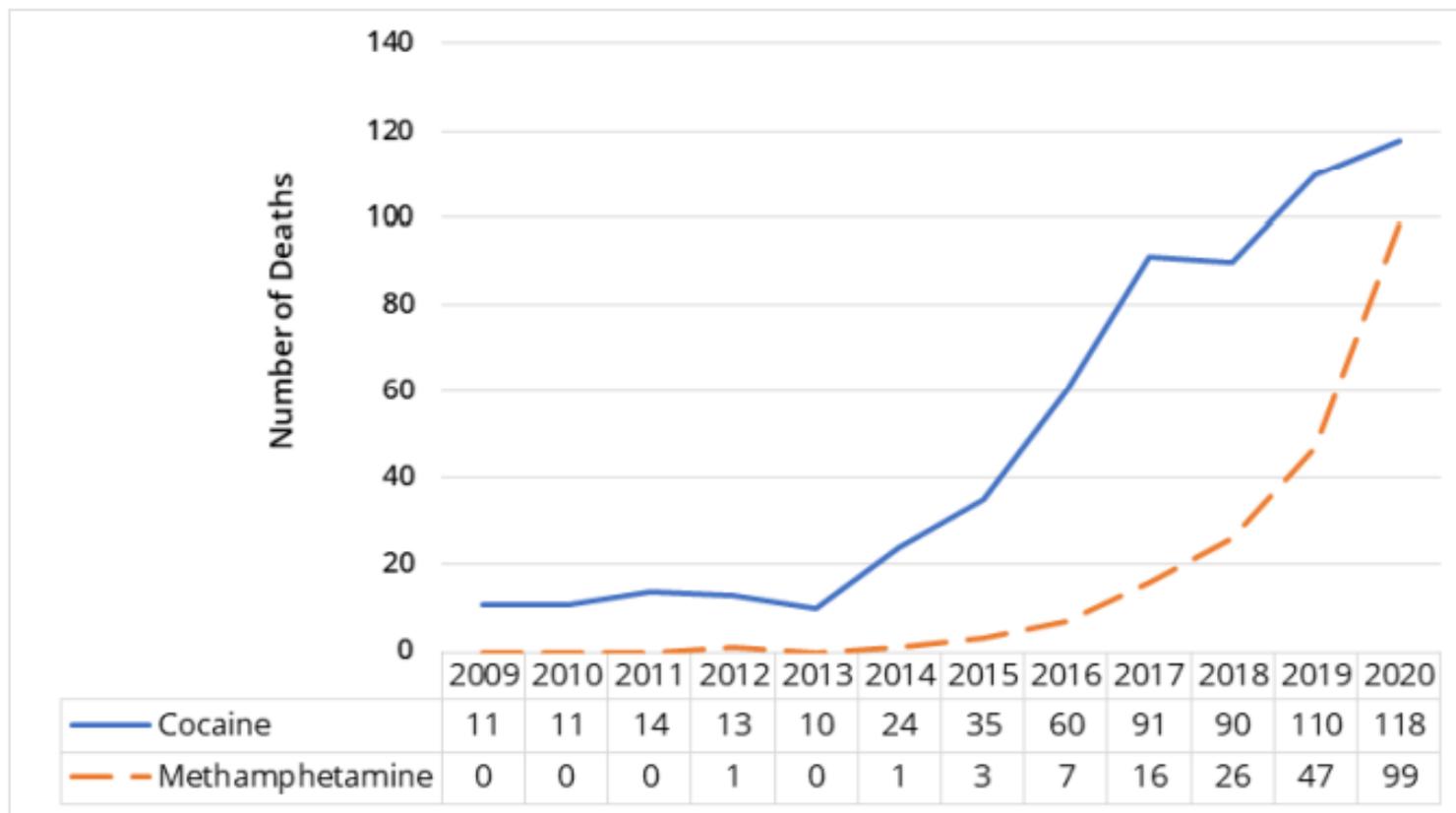


Table 6: Key drug categories and combinations causing death among confirmed overdoses

Cause of death (alone or in combination with other drugs) Sample size for confirmed cases only	Jan-Dec 2021 Est. N = 631	Jan-Dec 2022 N = 642
Fentanyl or fentanyl analogs	489 (77%)	507 (79%)
Heroin	22 (3%)	15 (2%)
Cocaine	156 (25%)	191 (30%)
Methamphetamine	172 (27%)	208 (32%)
Pharmaceutical opioids**	130 (21%)	128 (20%)
Fentanyl and heroin	20 (3%)	15 (2%)
Fentanyl and cocaine	127 (20%)	156 (24%)
Fentanyl and methamphetamine	133 (21%)	170 (26%)
Fentanyl and xylazine	53 (8%)	39 (6%)
Fentanyl and tramadol	24 (4%)	9 (1%)

**Nonpharmaceutical tramadol is now being combined with fentanyl in pills and powders for illicit drug use. When found in combination with fentanyl, and in the absence of a known prescription, tramadol is categorized as a nonpharmaceutical opioid.

[Maine Monthly Overdose Report for December 2022 \(mainedrugdata.org\)](https://mainedrugdata.org)



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Reason People Who Use Opioids Like Methamphetamine

Survey of 300 entering treatment

- High-seeking (51%)
- Balance of effect to function better (39%)
- Available as an opioid substitute (15%)
- Escape from Life/Numbness (10%)
- Addiction (9%)
- Social Setting (6%)



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Ellis, Kasper, Z. A., & Cicero, T. J. (2018). Twin epidemics: The surging rise of methamphetamine use in chronic opioid users. *Drug and Alcohol Dependence*, 193, 14–20. <https://doi.org/10.1016/j.drugalcdep.2018.08.029>

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Health and Socio-demographic Differences

People who use opioids and psycho-stimulants (or psychostimulants alone)

- Higher rates of chronic co-morbidity
 - Mental health
 - Infectious disease (Hepatitis C)
- Higher rates of social marginalization
 - Homelessness
 - Incarceration history



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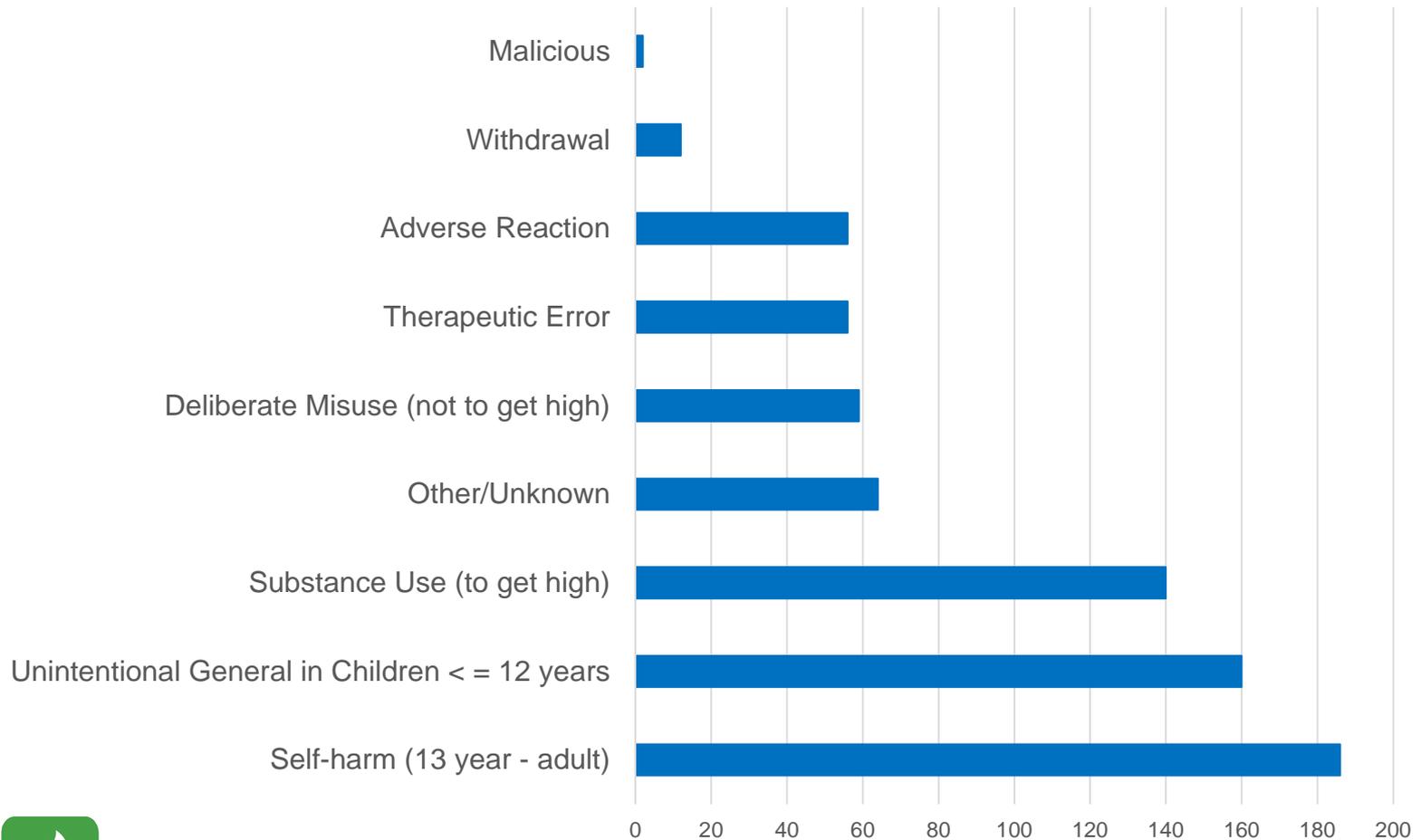
Fischer, O'Keefe-Markman, C., Lee, A., & Daldegan-Bueno, D. (2021). 'Resurgent', 'twin' or 'silent' epidemic? A select data overview and observations on increasing psycho-stimulant use and harms in North America. *Substance Abuse Treatment, Prevention and Policy*, 16(1), 17–17. <https://doi.org/10.1186/s13011-021-00350-5>

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Reasons for Buprenorphine Poisonings

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735 cases from Jan 2018 – Oct 2023



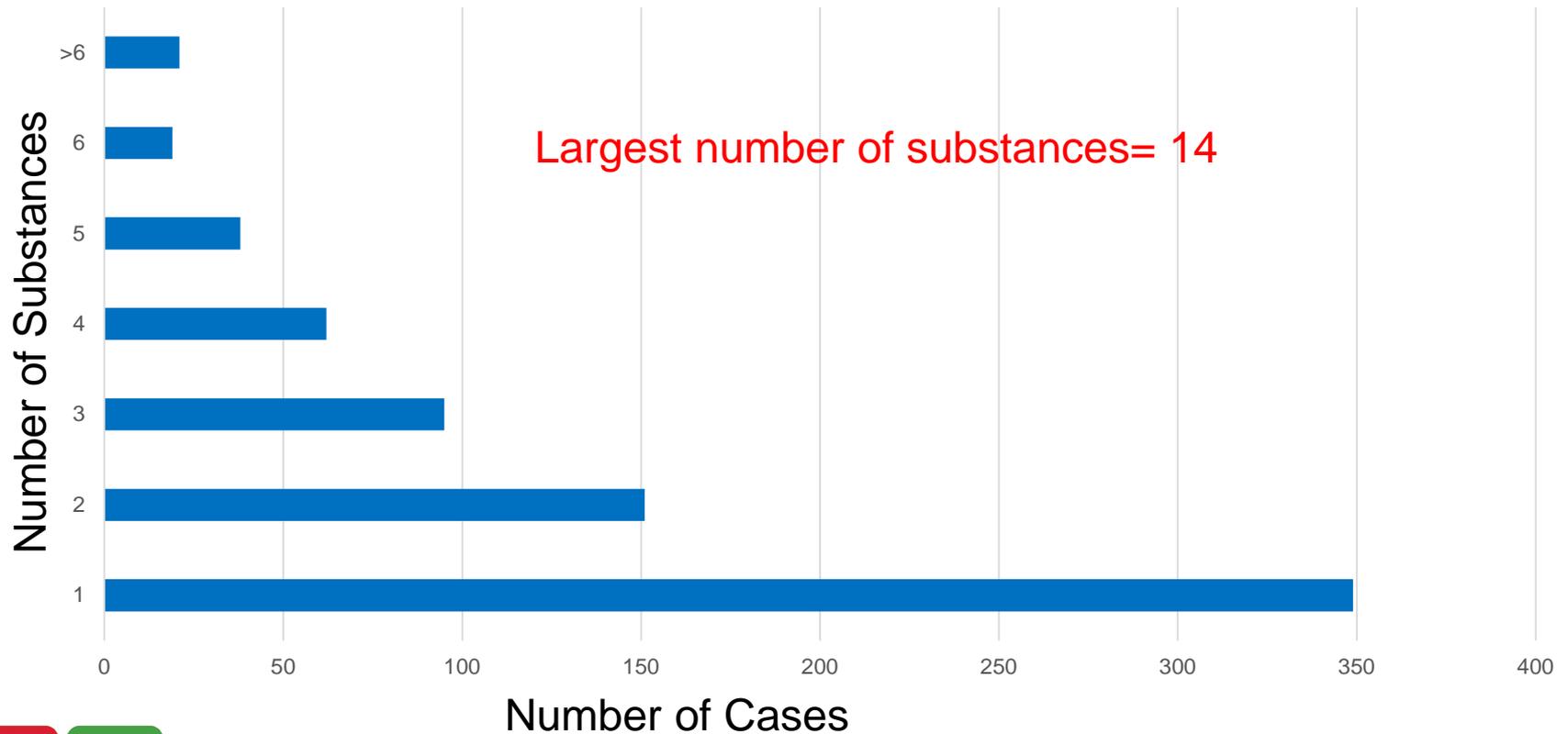
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Buprenorphine

Number of Substances Taken

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735 cases from Jan 2018 – Oct 2023



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Naloxone

When it is more harmful than helpful

- Agitation
- Aspiration
- Pulmonary edema
- Seizures
- Dysrhythmias



Yugar B, et. al. (2023). Systematic Review of Naloxone Dosing and Adverse Events in the Emergency Department. *J Emerg Med*, 65(3), e188–e198.

Maloney LM, et. al. (2020). Prehospital Naloxone and Emergency Department Adverse Events: A Dose-dependent Relationship. *J Emerg Med*, 59(6), 872-883.

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Naloxone

Usually Actions Leading to Problems

- Unnecessary administration
- Too high of a dose
- Use in polysubstance overdose
- Administration without pre-oxygenation



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Fentanyl

Risk to Emergency Responders

- Risk is extremely low
- Those who are alert and can speak are OK
- Self-administration is inappropriate
- No reason to panic



Moss, MJ, et. al. (2017). ACMT and AACT position statement: preventing occupational fentanyl and fentanyl analog exposure to emergency responders. *Clin Toxicol*, 56(4), 297-300.

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Key Messages:

- Pediatric exposure to opioids, including those for treatment of substance use disorder, are a serious concern
- Increased cannabis acceptance is a poisoning problem
- Polysubstance use is a concern in opioid use disorder patients
- Naloxone and buprenorphine are poisons when use is not optimal
- The risk of harm from inadvertent fentanyl exposure in adults is extremely low



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