

Injury prevention in childhood poisoning

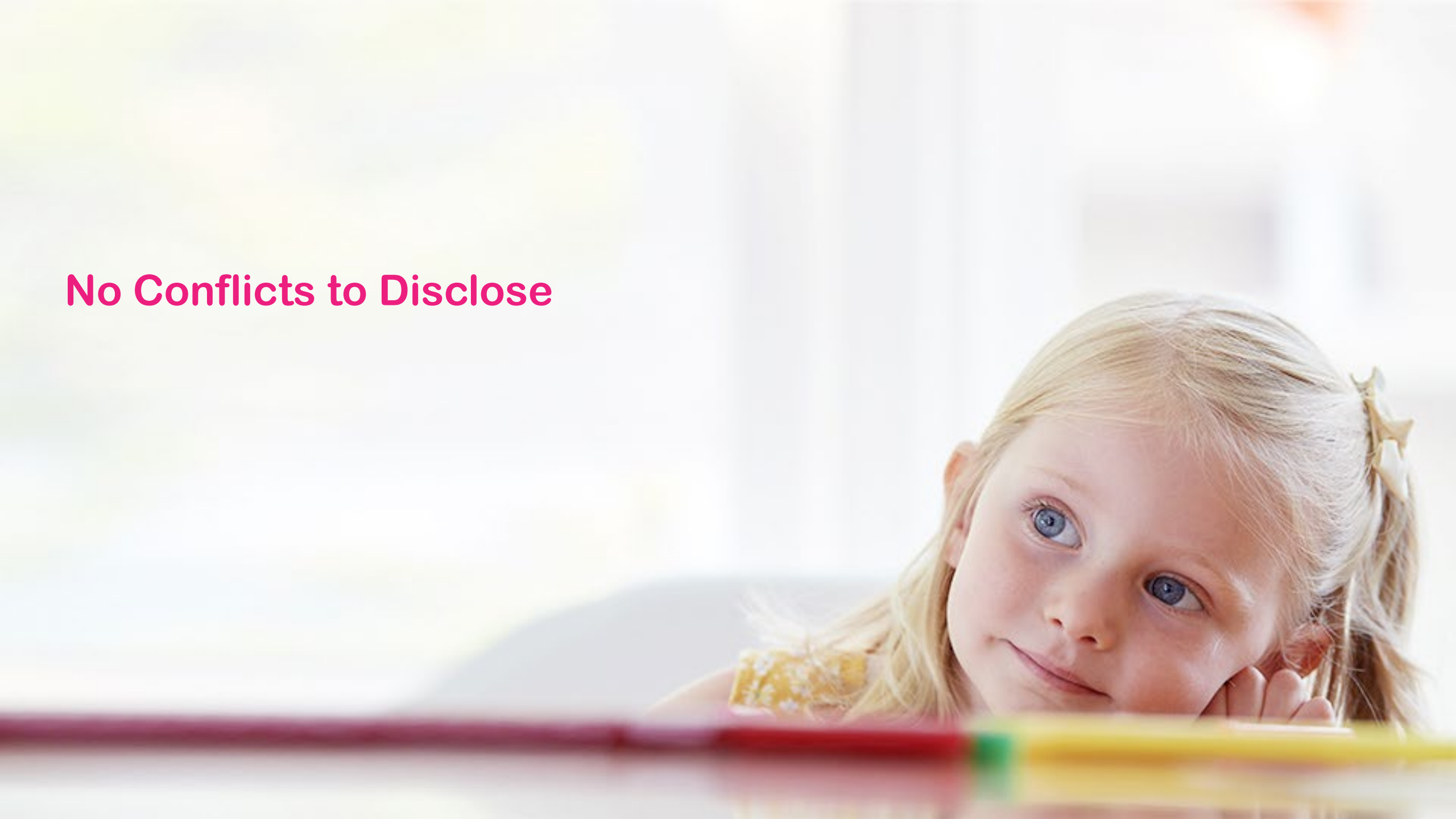
Anthony Jaworski, PharmD

May 7, 2025

American Trauma Society – PA Division



No Conflicts to Disclose



Objectives

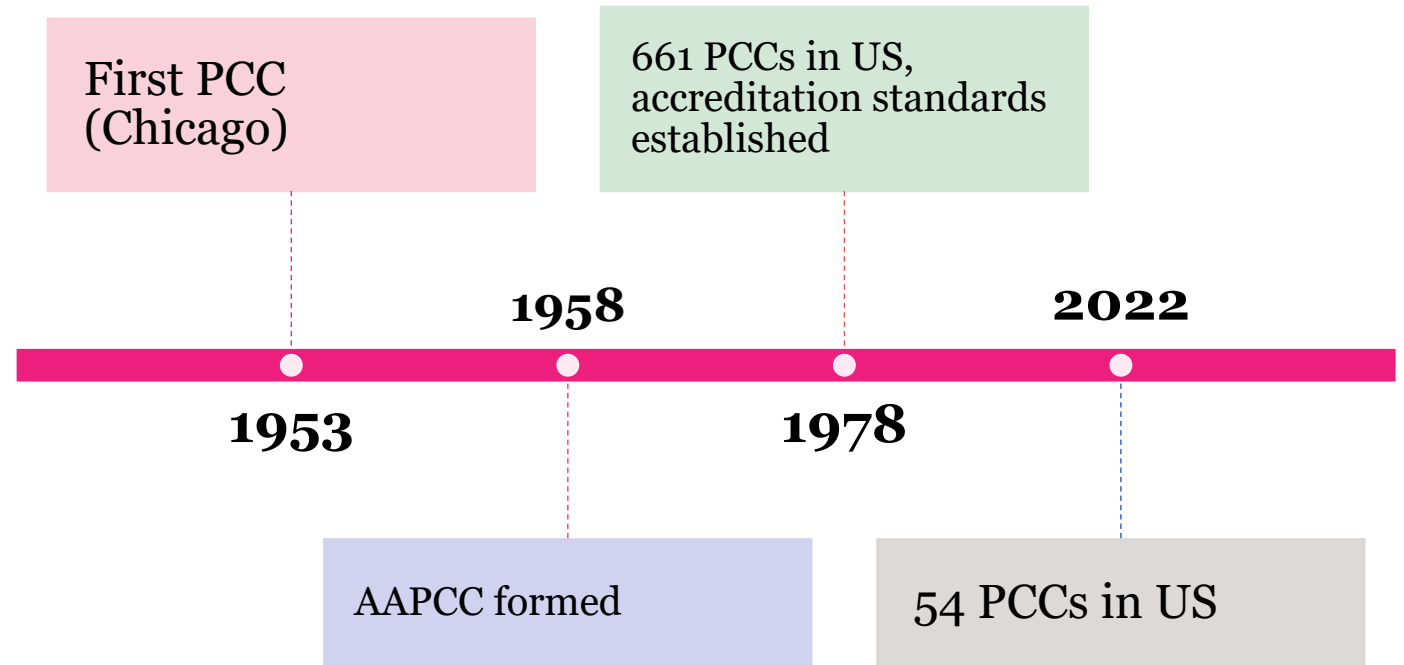


- Discuss the roles of poison control centers in the U.S. public health system.
- Identify pertinent trends in poison control center data related to child welfare.
- Explore harm reduction strategies and the importance of reporting cases to the poison control centers.

Poison Control Centers



A brief history



PCC: Poison Control Center
AAPCC: American Association of Poison
Control Centers

Dart RC. The secret life of America's poison centers. Ann Emerg Med.
2012;59(1):62-66.

POISON CENTERS

1-800-222-1222 Nationwide



NPDS
NATIONAL POISON DATA SYSTEM

Missions



Provide a 24/7 poison helpline



Provide expert toxicology consultation



Collect data for real-time epidemic surveillance



Support public health policy



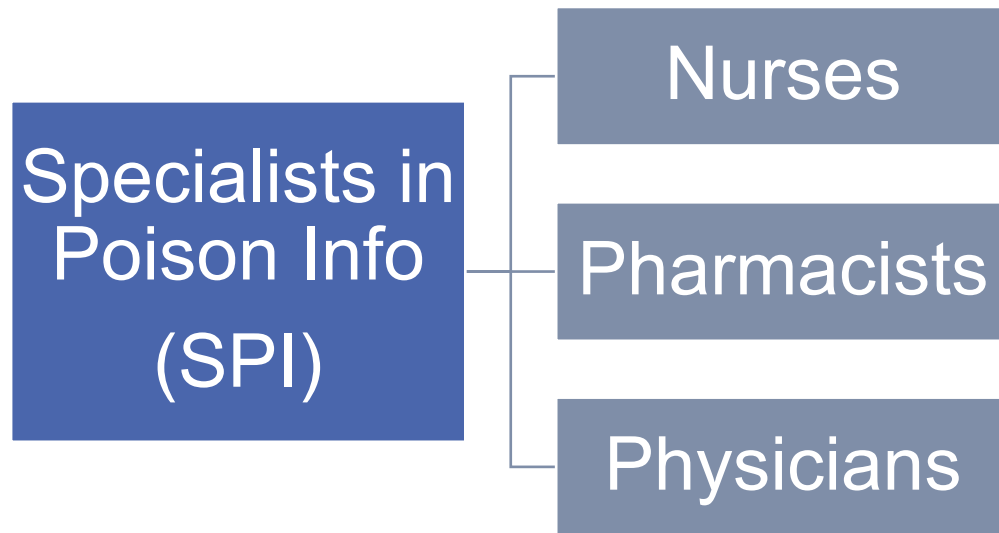
Educate the public about poisoning prevention



Education professionals about toxicology

AMERICA'STM
POISON
CENTERS

Who answers the call



Benefits of the helpline

Reduced hospital
LOS
(mean reduction
11.6h)

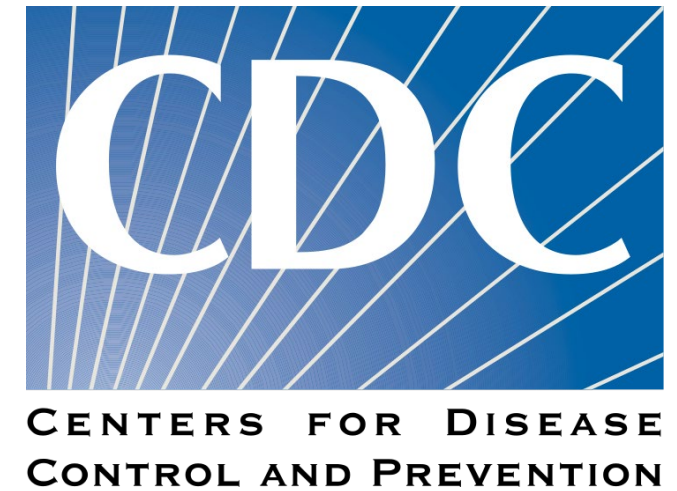
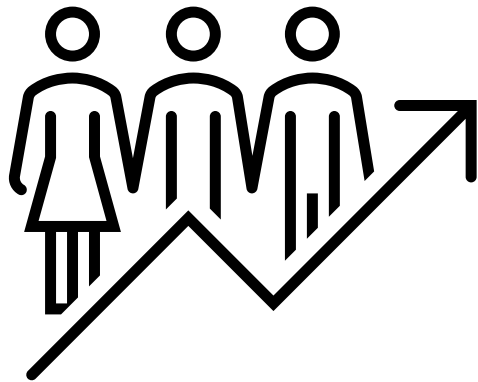
Significant health
care savings
(~16%)

Reduction
emergency
department visits



Surveillance

- Data warehouse for the **54 centers**
- **Deidentified** case information
- Uploaded every **8 minutes**
- Considered a public health surveillance activity

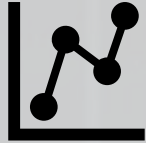


How it works



Call to **PCC**

- Assess call
- Recommend therapy
- **Collect information**



Automated NPDS **algorithms**

- Call volume
- Clinical effect volume
- Case-based



Outreach to **state department** and **regional PCC**

Data uploaded
into **NPDS** every
8 minutes



CDC review of
anomaly



Trends in child poisoning



NPDS Annual Report (2022)

Exposure Cases (N=2,064,875)

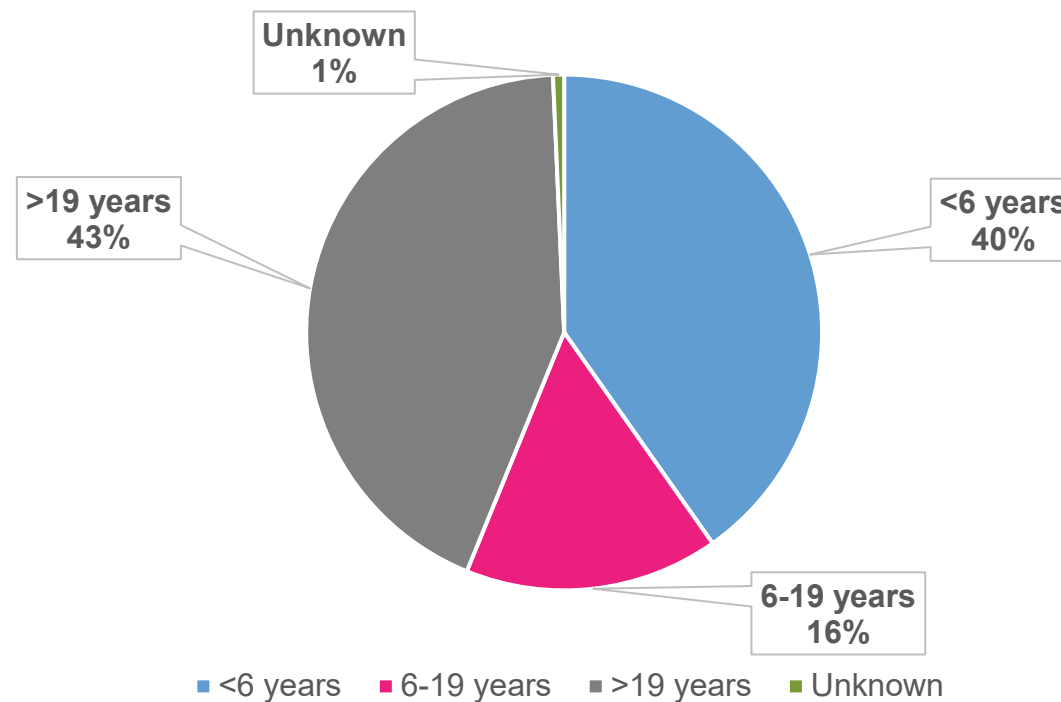


Table 3B. Population-Adjusted Exposures by Age Group

Age Group	Exposures/100k population	Number of Exposures ^a	Population ^b
Children (<20)			
< 1	2,606	96,861	3,717,047
1	6,954	251,922	3,622,534
2	6,556	244,304	3,726,665
3	3,400	128,359	3,775,766
4	1,710	66,071	3,863,011
5	1,030	40,599	3,940,227
Child 6-12	480	137,435	28,617,648
Teen 13-19	609	186,366	30,595,021
Subgroup	1,417	1,159,710	81,857,919
Adults (≥20)			
20-29	428	194,227	45,387,351
30-39	363	167,234	46,018,425
40-49	280	116,398	41,502,255
50-59	252	106,681	42,257,869
60-69	235	94,477	40,210,112
70-79	254	67,046	26,380,654
80-89	294	31,545	10,732,105
90+	288	7,533	2,613,317
Subgroup	349	890,863	255,102,088
Overall Total	613	2,064,875	336,960,007

^aNumber of Exposures excludes unknown ages from the individual age categories, but includes them in the Subtotals and Overall Total (see Table 3A).

^bAmerica's Poison Centers Total as of 1 July 2020, 336,960,007 (see Table 1A) [2].

Poisoning characteristics



- **87%** of cases involved **one substance**
- Exposure site:
 - **93%** occur in a **residence**
 - Others: public areas, workplaces
- Management site:
 - **67%** at **home**
 - 30.6 % at healthcare facility
- Reasons:
 - **76% unintentional**
 - 19% intentional (13% suspected suicide)
 - 5% Adverse reactions, other



Common poisonings



Substance category	% of cases
Analgesics	11.5
Cleaning substances	7.23
Antidepressants	5.61
Cosmetics/personal care	5.23
Antihistamines	4.81
Cardiovascular drugs	4.7

Most serious outcomes?

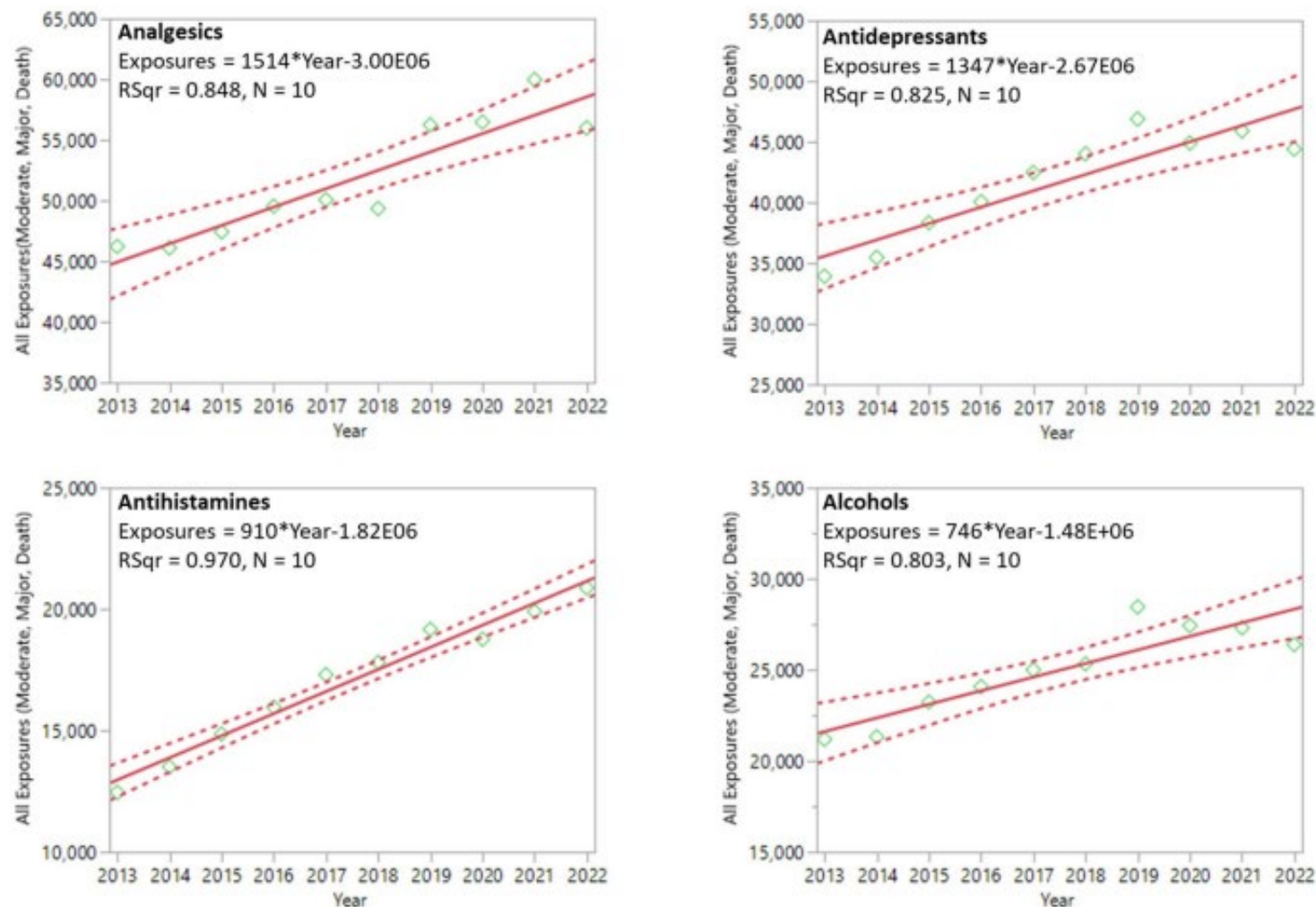


Figure 5. Substance Categories with the Greatest Rate of Exposure Increase since 1 January 2013 for More Serious Outcomes (Top 4). Solid lines show least-squares linear regressions for the human exposure cases per year for that category (\diamond). Broken lines show 95% confidence interval on the regression.

Pediatric fatalities in 2022

118 (7.9%) deaths in children

61 (1.8%) deaths involving children ≤ 5 years

Analgesics

Batteries

Fumes/gases/vapors

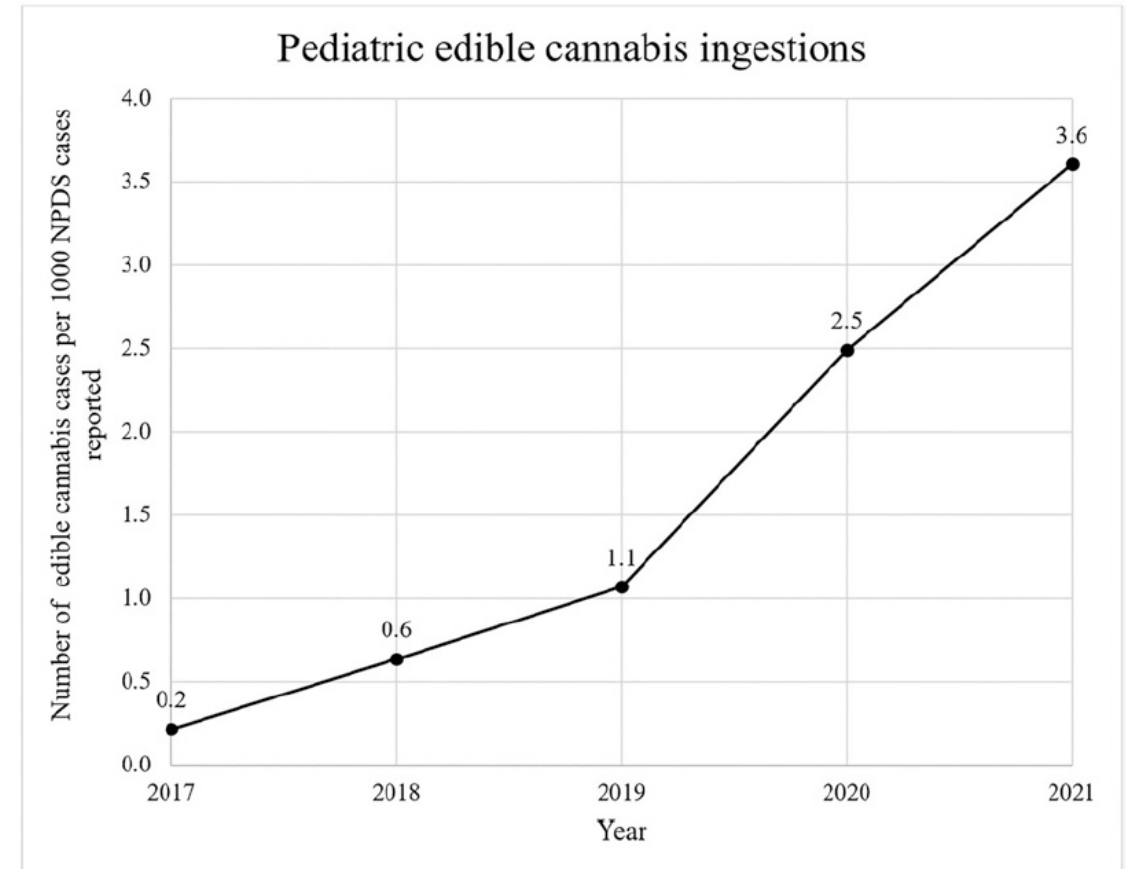
Stimulants and street drugs

Cough and cold preparations

Trends of interest

- **Laundry Detergent Single Unit Packs** (2012)
 - *Product safety features implemented*
- **E-cigarette** related poisonings (i.e., nicotine; 2014)
 - *Child Nicotine Poisoning Prevention Act of 2015*
- Exposures to cleaners/**disinfectants** (2020)
- E-cigarette or **vaping** use-associated lung injury (2020)
- **Melatonin** pediatric ingestions (2022)
- Pediatric **cannabis** edible ingestions (2022)
- Social media trends (ongoing)

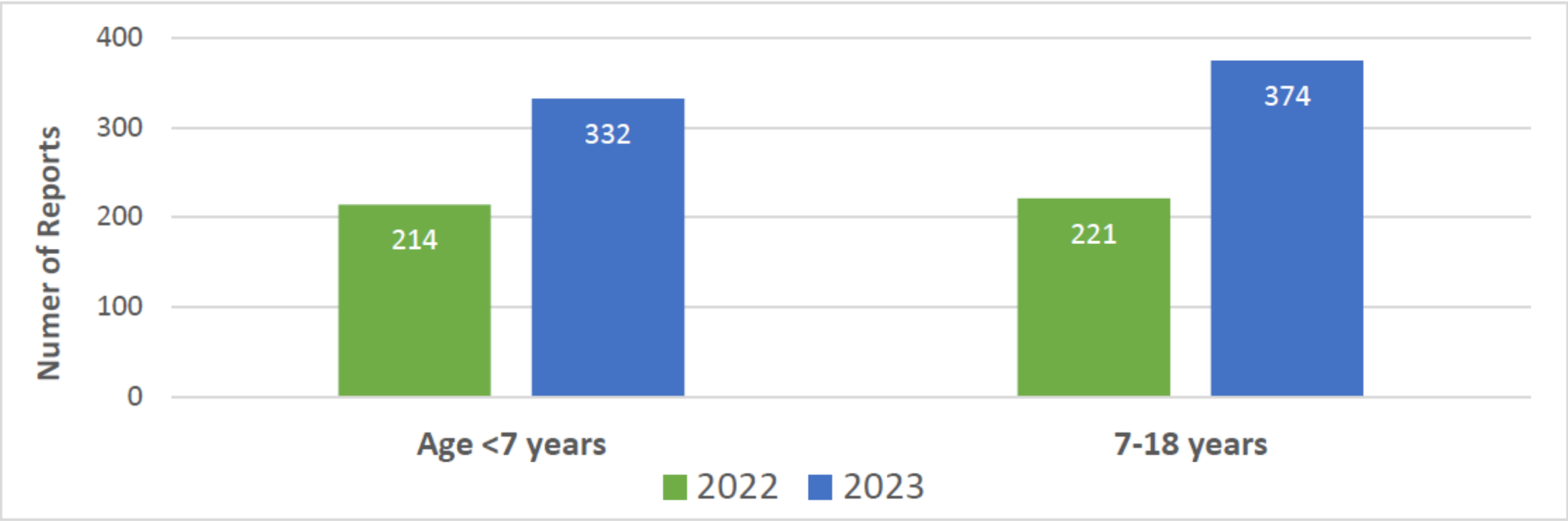
Pediatric cannabis ingestions



Tweet M, Nemanich A, et al. Pediatric edible cannabis exposures and acute toxicity: 2017 to 2021. Pediatrics. 2023;151(2): e1-7

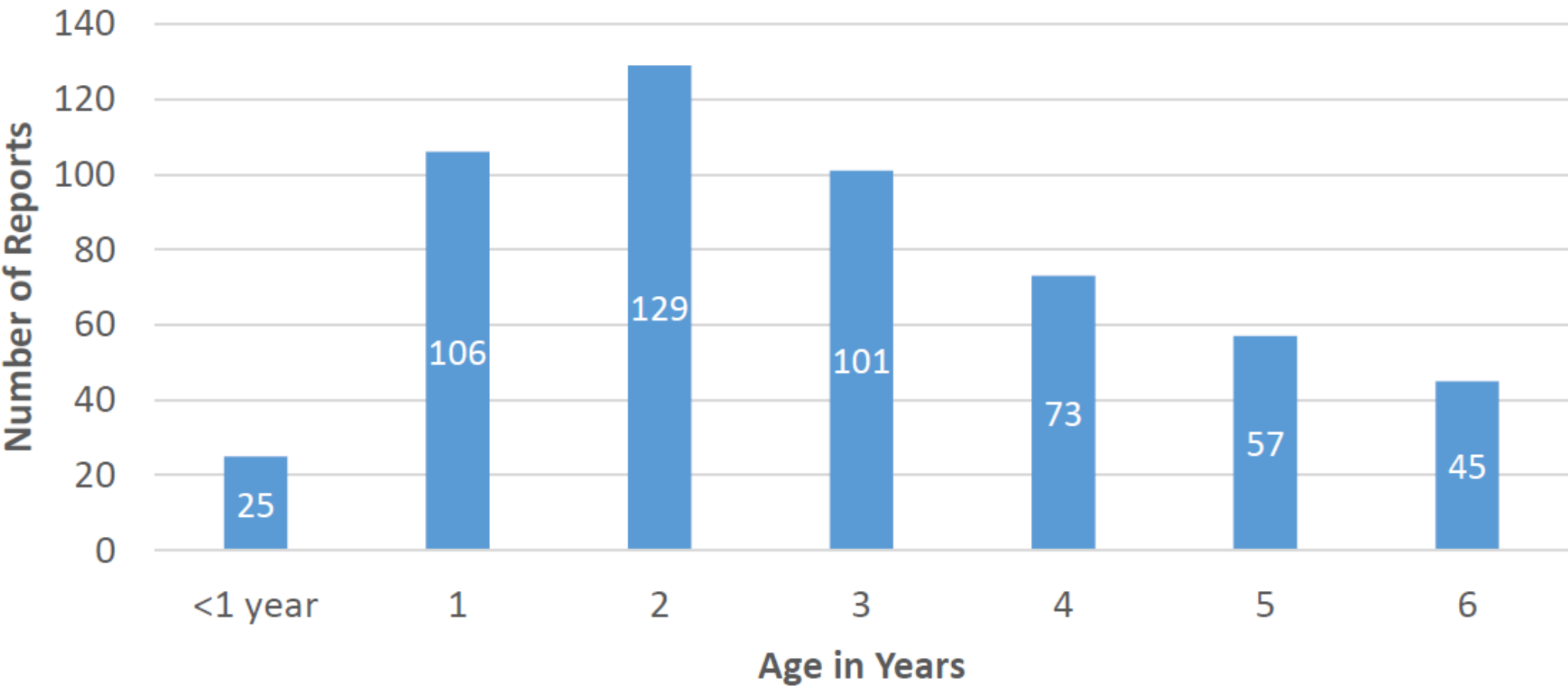
Figure 1: Annual Marijuana / Δ-9-THC Reports to PA Poison Centers by Age Group, 2022-2023

- In 2015, PA poison centers documented 4 marijuana cases among children aged < 7 years.
- In 2019, PA poison centers documented 27 marijuana cases among children aged < 7 years.



*Due to technical issues in the data retrieval procedures, the depicted data in Fig 1 slightly undercounts cases of 18-year-olds within poison center records.

Figure 4: Age Distribution of Annual Marijuana / THC Reports to PA Poison Centers among Children ≤6 years, 2022-2023



Cannabis: Key findings

- Accidental pediatric marijuana exposures are almost a **daily occurrence**.
- Approximately half involve children \leq **2 years** of age.
- **Edible products** continue to be the biggest threat.
- 29% of cases were classified as having **significant clinical effects**.

Cannabis: Considerations

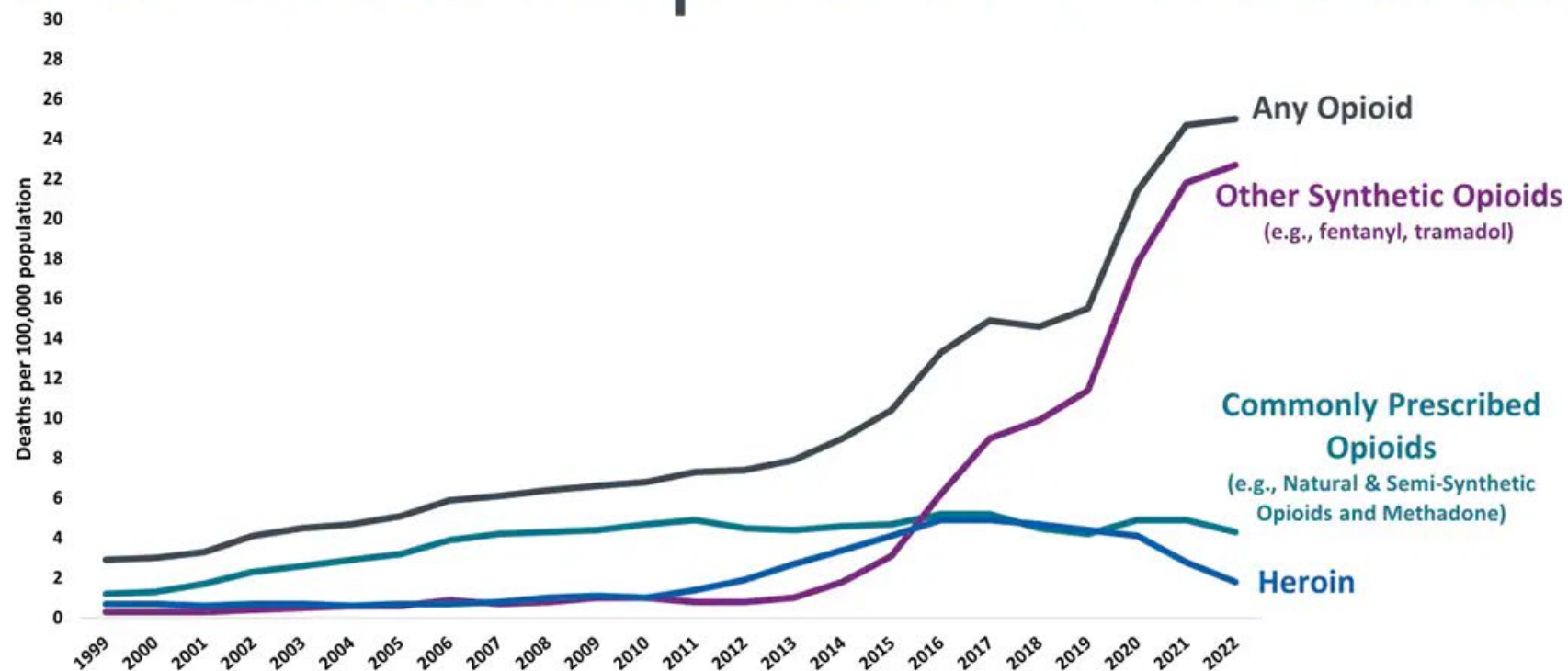
• Policy

- Improved, standardized product packaging.
 - Child-resistant
 - Unit-dose packaging
 - Conspicuous labeling
 - Limit dose?
- Prohibit products that resemble child products.
- Sell separately from other consumables.

• Prevention

- Avoid bringing edible products home.
- Treat cannabis like a medication.
- Openly discuss with family and friends.
- Be aware that supervision of children may be impaired by cannabis intoxication.

Three Waves of Opioid Overdose Deaths



Wave 1: Rise in Prescription Opioid Overdose Deaths Started in the 1990s

Wave 2: Rise in Heroin Overdose Deaths Started in 2010

Wave 3: Rise in Synthetic Opioid Overdose Deaths Started in 2013

SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2024. <https://wonder.cdc.gov/>.





Opioids

- National Fatality Review-Case Reporting System

- 2005 to 2018, deaths \leq 5 years of age
- Opioids were most common
- 24.1% (2005) \rightarrow 52.2% (2018)
- 65% fatalities occurred at home

Gaw CE, Curry AE, et al. Characteristics of Fatal Poisonings Among Infants and Young Children in the United States. *Pediatrics*. 2023;151(4):e2022059016

- NPDS data

- 2012 to 2021, pediatric deaths
- 26% opioids, 21% fire-related smoke inhalation, 7% button batteries

Weigel, Bernard, et al. "Beyond one pill can kill: a decade of pediatric deaths reported to America's poison centers." *Pediatric emergency care* 40.7 (2024): e108-e109.

Opioid harm reduction

Prevention

- Opioid prescribing
- Storage
- Disposal



Expanding access to naloxone

- Emergency departments
- Community events
- Co-prescription with opioids
- First-responders
- Addition to AED systems

Trella J, Linstead Goldsmith R. Naloxone is going “over the counter.” Will it reach our kids? CHOP Policy Lab. 2023.
<https://policylab.chop.edu/blog/naloxone-going-over-counter-will-it-reach-our-kids>

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Scenarios (Prevention)



“Child-proofing” the home



<https://www.cpsc.gov/safety-education/safety-guides/kids-and-babies/childproofing-your-home-12-safety-devices-protect>

DOs

- Know the harmful substances in the home.
 - Medicines
 - Chemicals
 - Plants
 - Animals?
- Keep medicines and chemicals in original containers.
- Lock up all medicines (i.e., safety latches).
- Keep them out-of-site and out-of-reach.
- Update carbon monoxide detector batteries.
- Store the PCC phone.



DO NOTs

- Trust child-resistant caps
- Take medicine in front of children
- Refer to medicine as “candy” or a “treat”
- Purchase products that look attractive to kids
- Assume briefcases and purses are safe
- Store chemicals in food areas
- Keep old and unused medicines around



Medication disposal



- Drug take back days
 - takebackday.dea.gov
- FDA's flush list
 - Prone to misuse/abuse
 - Dangerous
- At home disposal kits
- Cat litter/coffee grinds

Scenario 1



The caller's 14-month-old grandchild got into the caller's morning pills.



The pills were in medication vials with "easy off caps."



The medications are often in her purse on the kitchen table and takes the medications with the child in site.



She ensures the caps are back on after use and that the purse is zipped.

Scenario 1 Prevention Tips?

1

Utilize child
resistant caps

2

Do not assume
purses are safe

3

Do not take pills in
front of children

Scenario 2

- A parent is in basement with their 9-month-old daughter folding laundry.
- The parent briefly has their back to the child.
- The parent hears a cough and finds the child with a laundry detergent pod popped in their mouth.



Scenario 2 Prevention Tips?

1

Keep chemicals in original containers.

2

Store chemicals up and out of reach, out of sight.

3

Avoid products that look attractive to kids.



Scenario 3

A parent calls the pediatrician after they found their 4-year-old child stumbling around the kitchen.

It is advised for the child to be taken to the emergency department.

It is later discovered that the child ingested a cannabis edible that the parents had in the back of the pantry. The parents disclose that they have not taken cannabis in a very long time.

Scenario 3 Prevention Tips?

1

Treat
cannabis like
a medication.

2

Keep
cannabis
away from
food areas.

3

Dispose of
any unused
substances.

4

Save the
poison control
number.

Key Messages



- Most child poisonings happen in our very own homes.
- Child injury from poisoning is entirely preventable and community education is important.
- Poison control centers offer anonymous, judgement free advice to caregivers and providers.



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