



The North American Opioid Crisis: Evaluating Recent Progress to Address the Opioid Epidemic

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Brandeis University

President,
Physicians for Responsible Opioid Prescribing



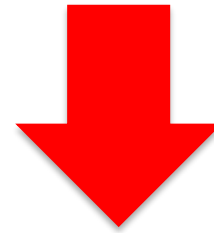
Opium



Opium



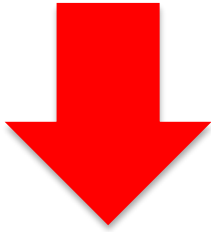
Codeine
Morphine
Thebaine



Heroin
Oxycodone
Hydrocodone
Hydromorphone
Oxymorphone

Codeine
Morphine
Thebaine

} OPIATES



Heroin
Oxycodone
Hydrocodone
Hydromorphone
Oxymorphone

} SEMI
SYNTHETIC
OPIOIDS

Fentanyl
Methadone
Tramadol

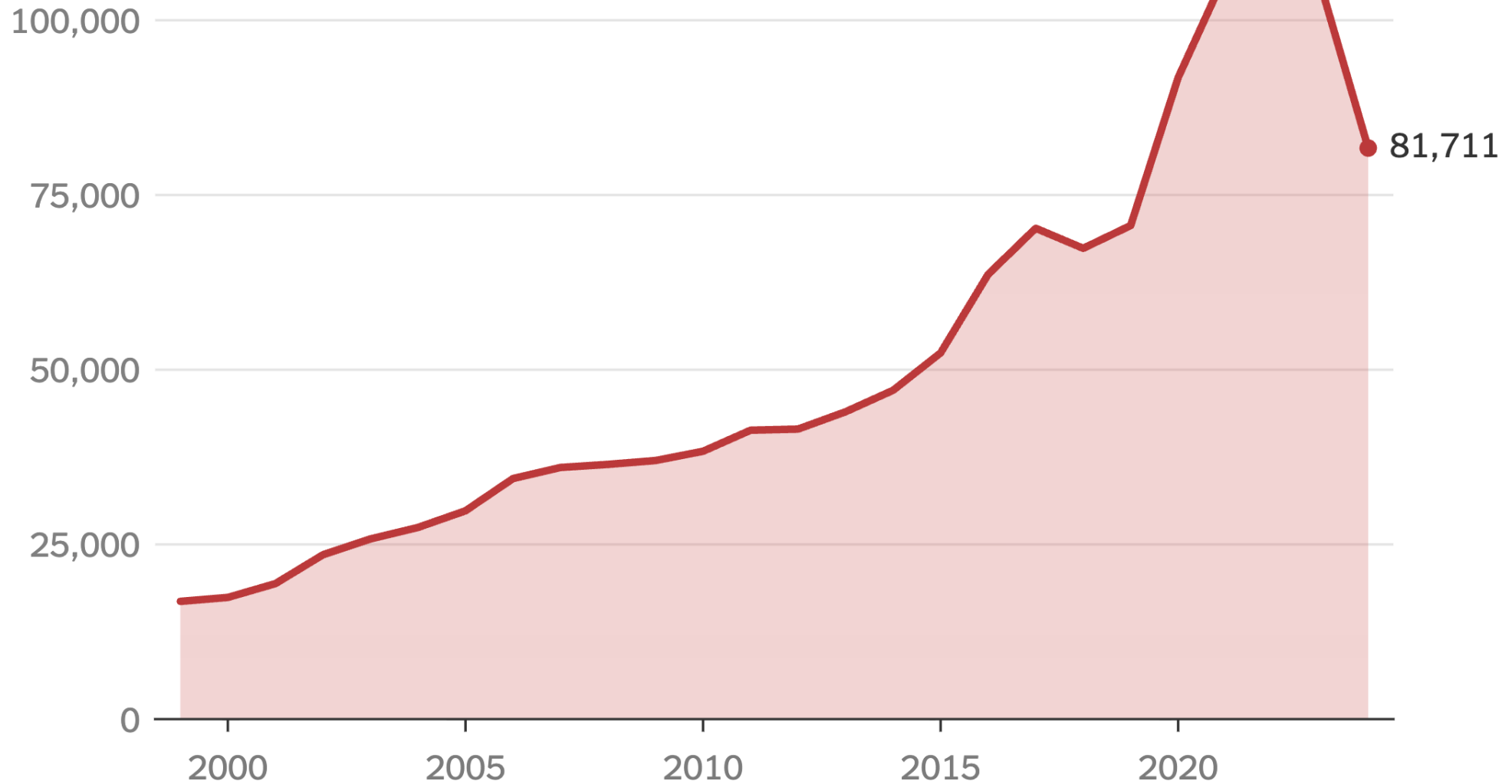
} SYNTHETIC
OPIOIDS

} OPIOIDS

Why Opioids Are Highly Addictive

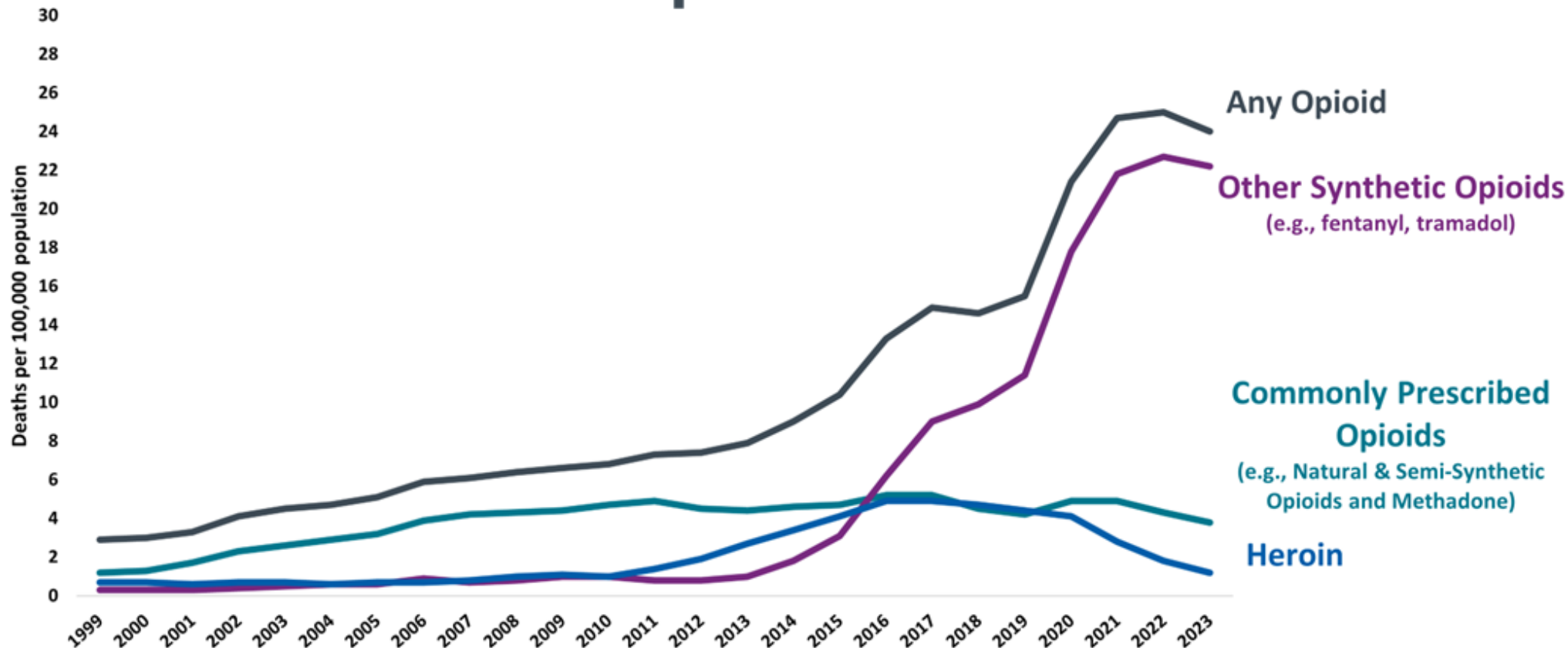
- *Taking an opioid produces positive effects: euphoria and/or pain relief.*
- *Once dependence sets in, stopping opioids produces negative effects: dysphoria and/or pain*

U.S. Drug OD deaths 1999-2024



Source: CDC Vital Statistics

Three Waves of Opioid Overdose Deaths



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/>.



12 Month-Ending Provisional Number of Drug Overdose Deaths by Drug or Drug Class

Based on data available for analysis on: September 7, 2025

After opening the **drug class dropdown**, click the top of the dropdown menu again to make the checkboxes disappear.

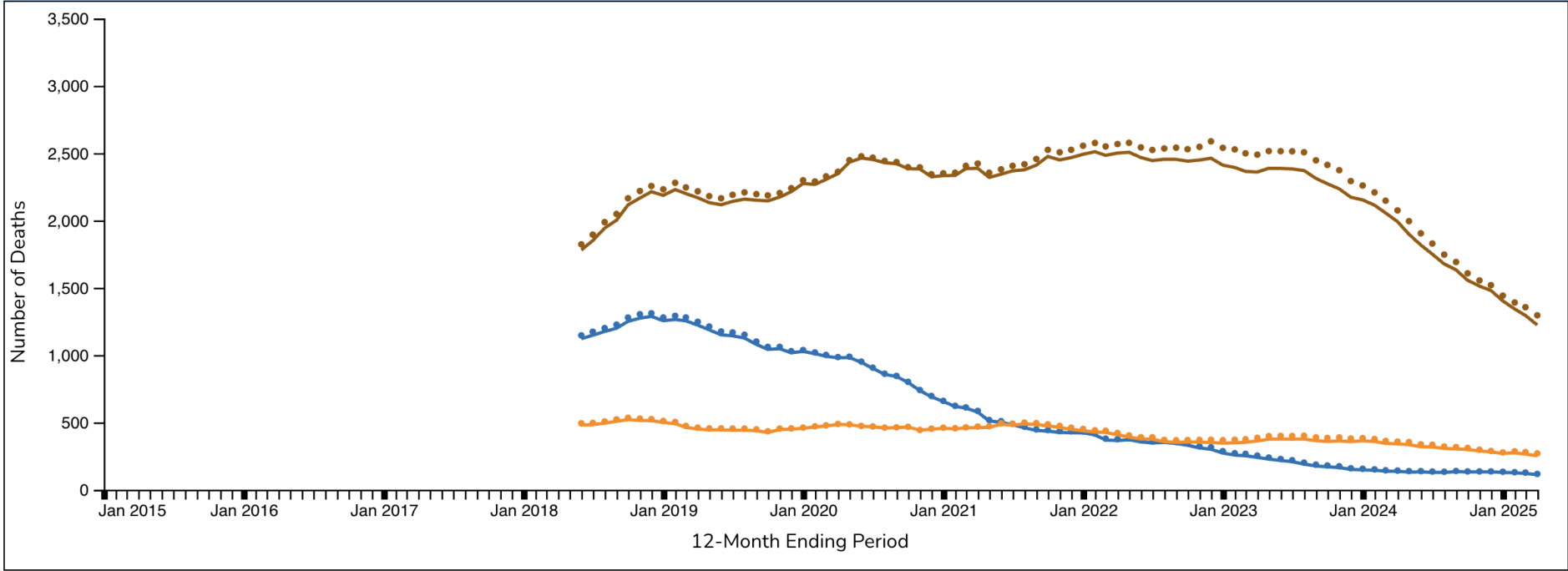
Select Jurisdiction

New Jersey

Select specific drugs or drug classes

Select drug class

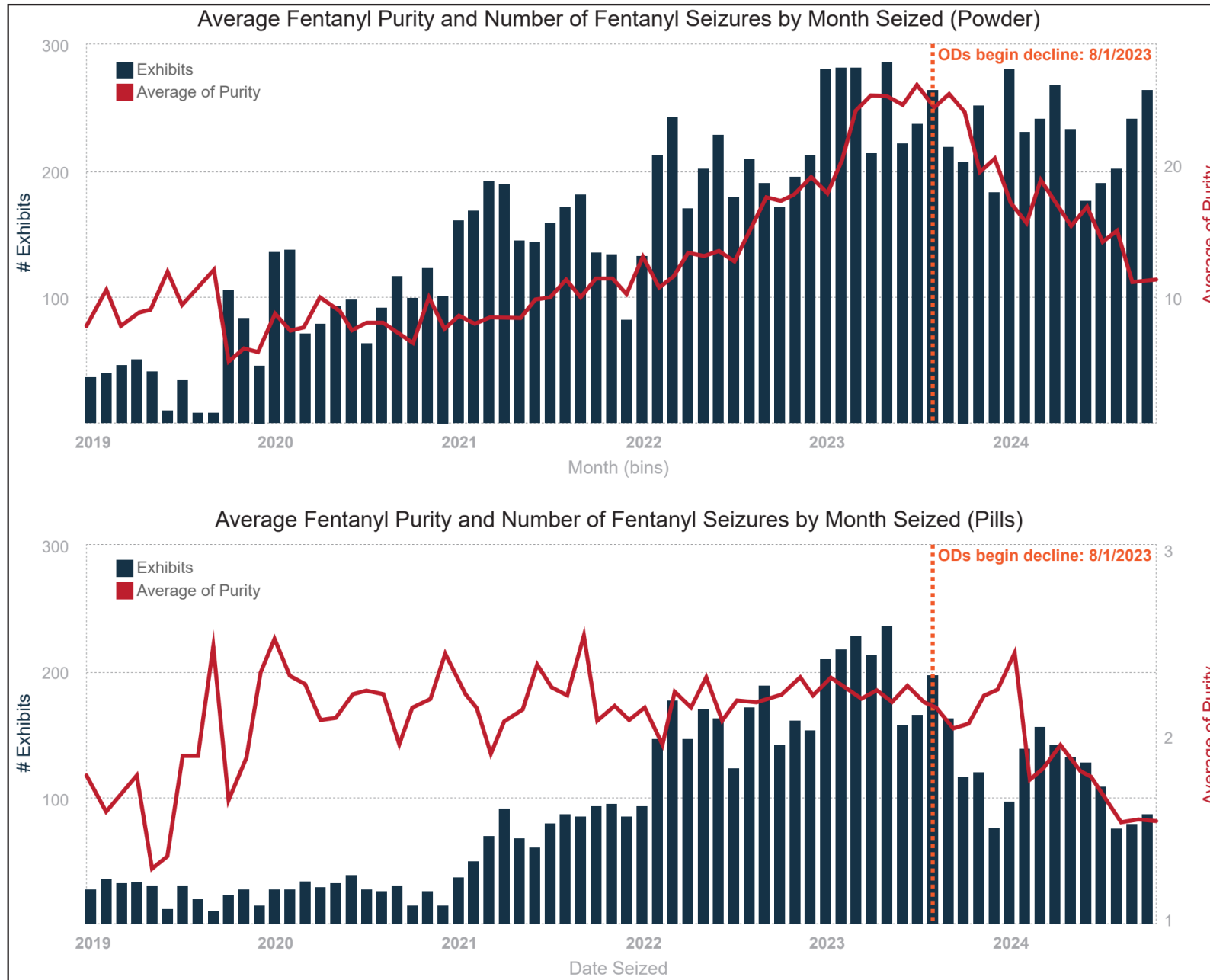
Figure 2. 12 Month-Ending Provisional Number of Drug Overdose Deaths by Drug or Drug Class: New Jersey



Legend for Drug or Drug Class

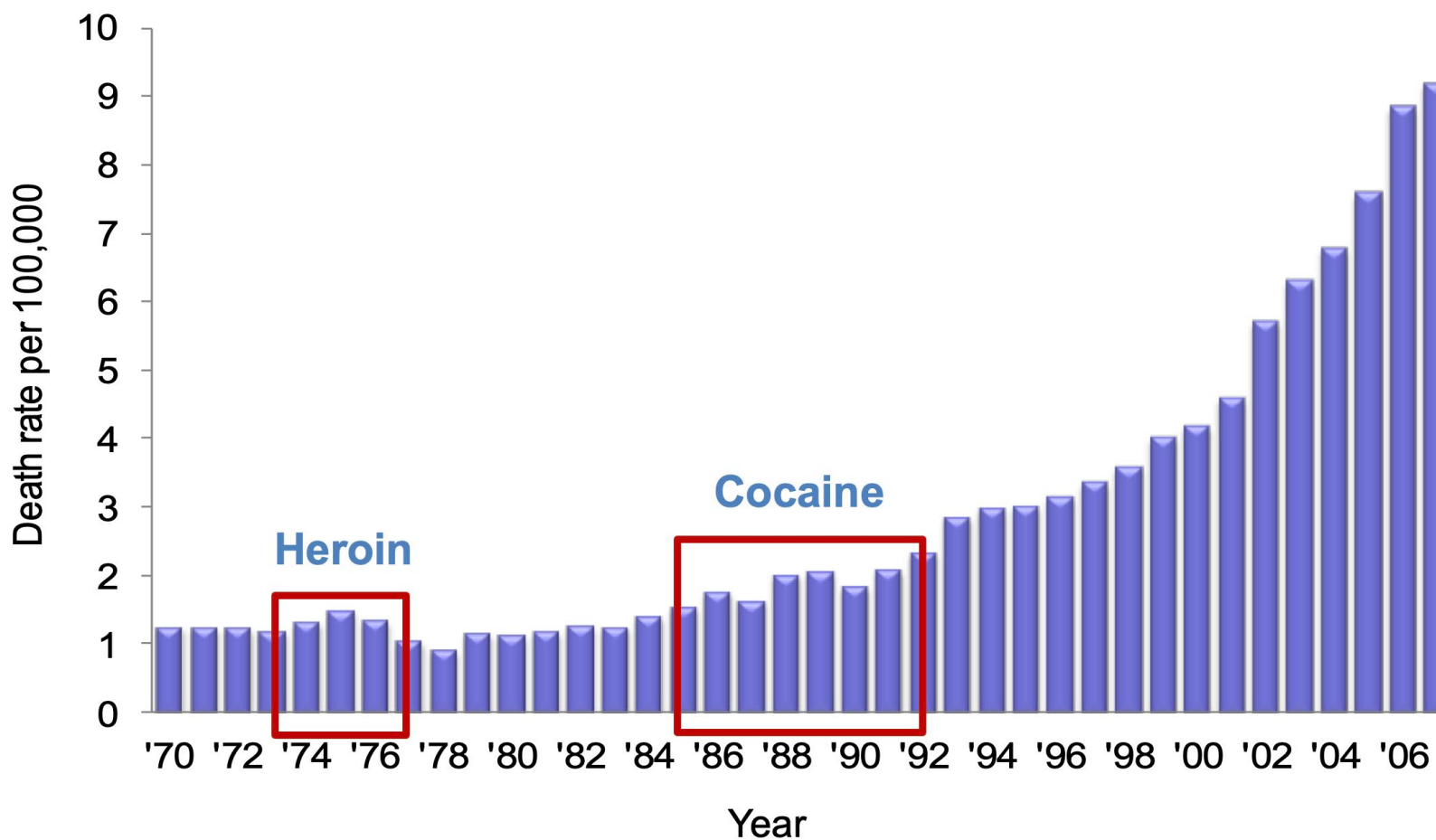
- Heroin (T40.1)
- Natural & semi-synthetic opioids, incl. methadone (T40.2, T40.3)
- Synthetic opioids, excl. methadone (T40.4)

- Reported Value
- Predicted Value

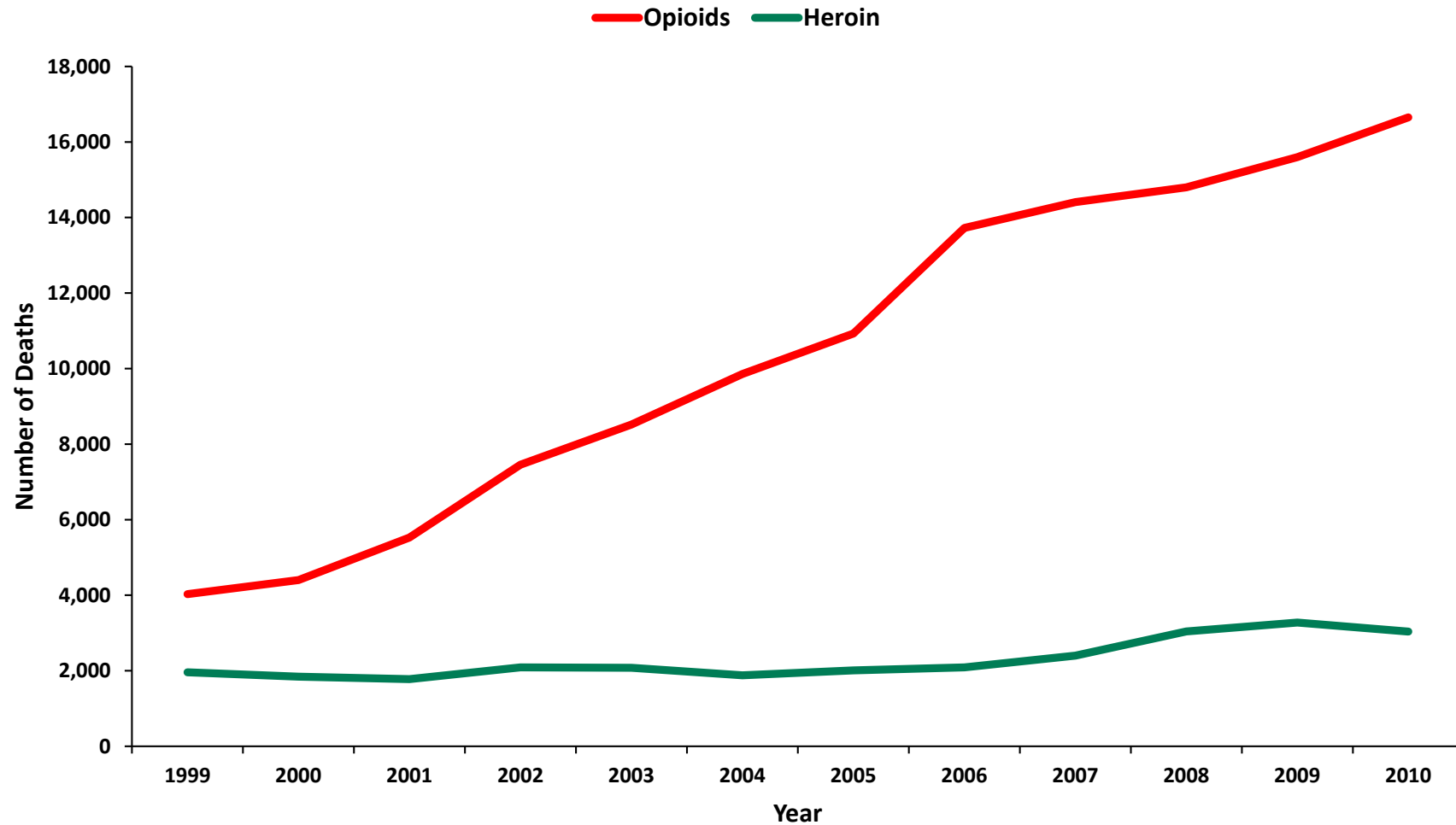


Source: DEA

Unintentional Drug Overdose Deaths United States, 1970–2007



Drug Overdose Deaths by Major Drug Type, United States, 1999–2010

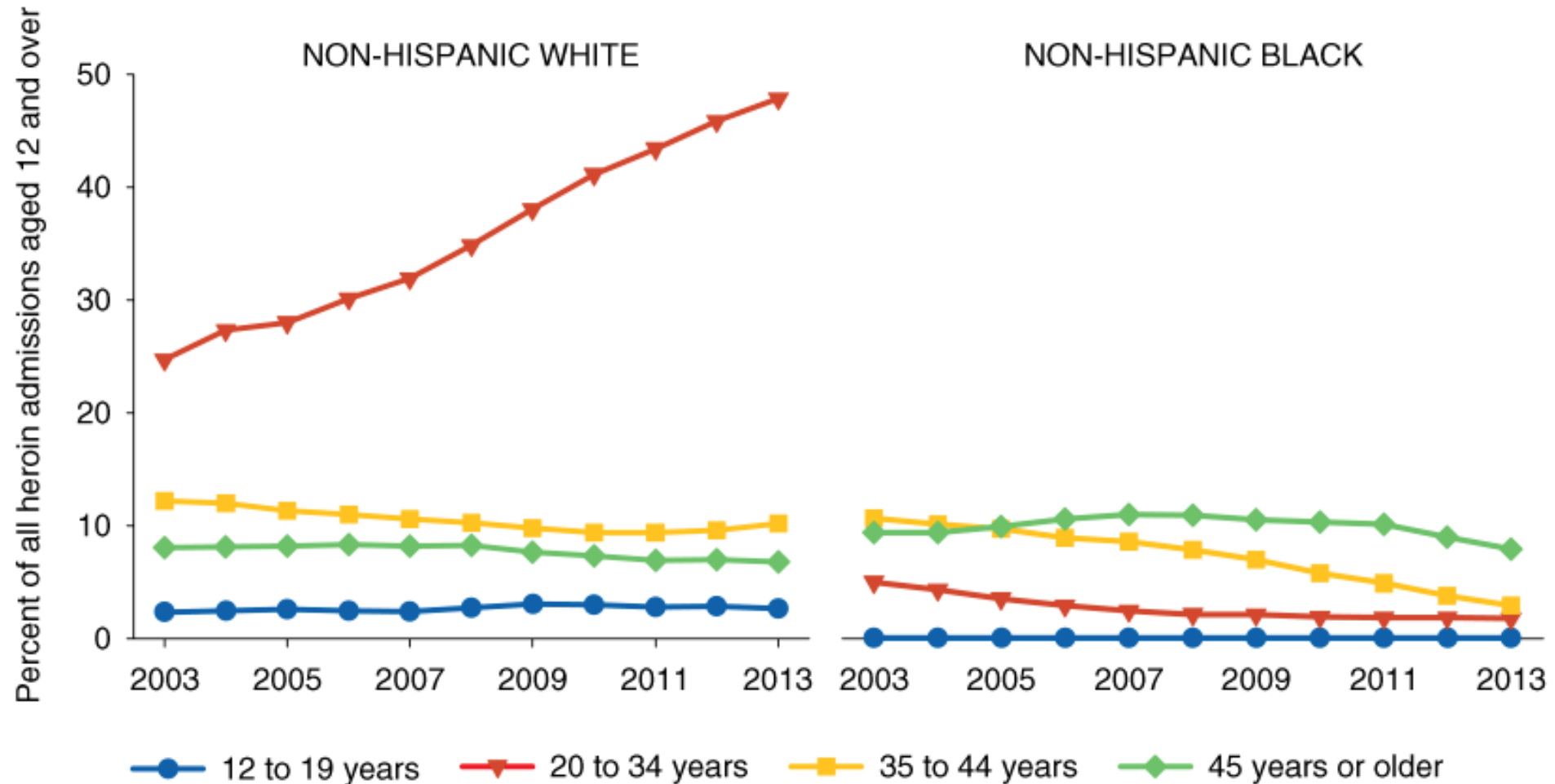


CDC, National Center for Health Statistics, National Vital Statistics System, CDC Wonder. Updated with 2010 mortality data.

Three Opioid-Addicted Cohorts

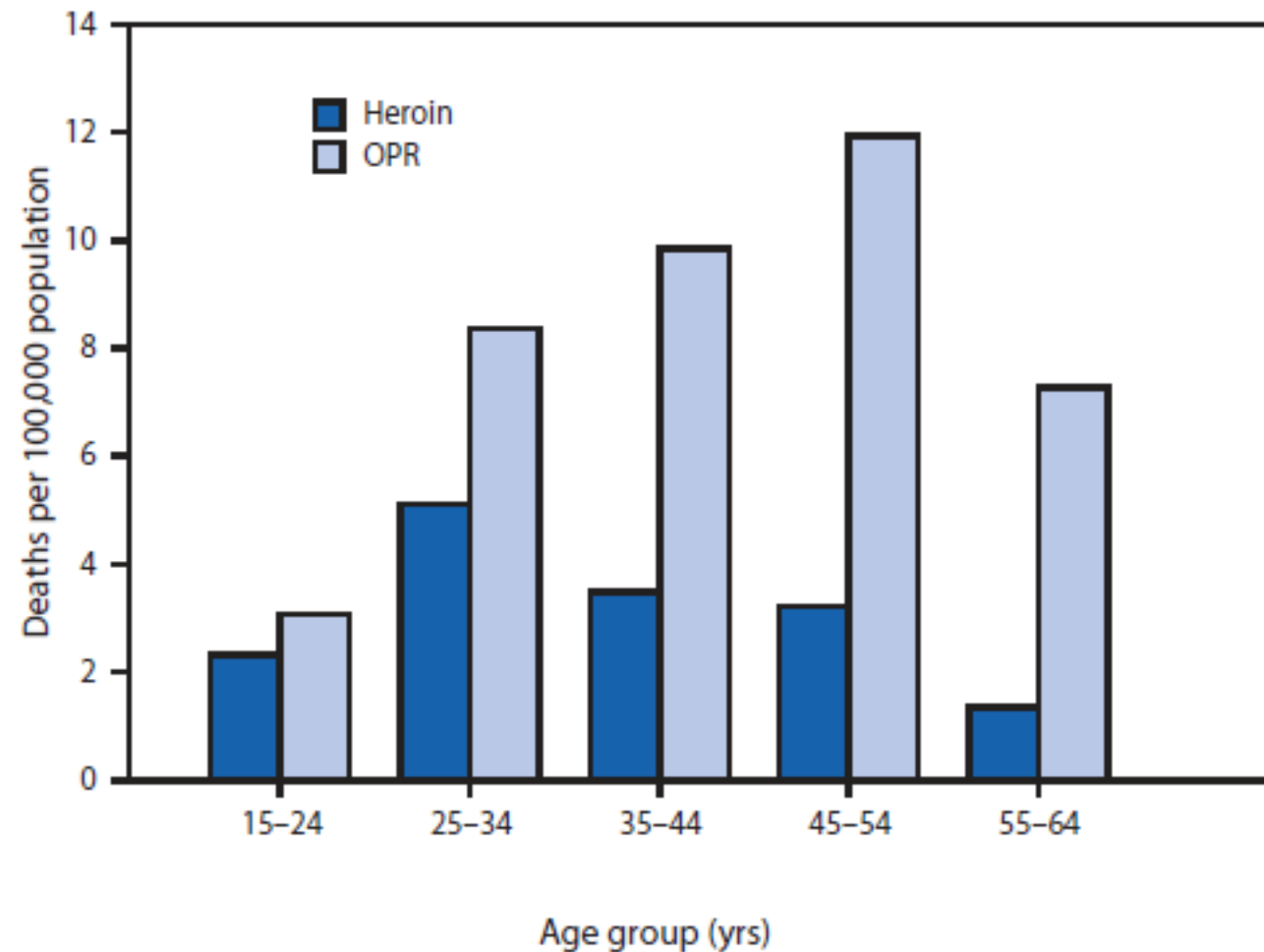
1. ***20-40 y/o, disproportionately white, significant heroin use, opioid addiction began with Rx use (addicted after 1995)***
2. ***40 y/o & up, disproportionately white, mostly Rx opioids, opioid addiction began with Rx use (addicted after 1995)***
3. ***50 y/o & up, disproportionately non-white, mostly heroin users, opioid addiction began in teen years with heroin use (addicted before 1995)***

Heroin treatment admissions : 2003-2013



SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 01.23.15.

Death rates from overdoses of heroin or prescription opioid pain relievers (OPRs), by age group



SOURCE: CDC. *Increases in Heroin Overdose Deaths — 28 States, 2010 to 2012*
MMWR. 2014, 63:849-854

In one year, drug overdoses killed more Americans than the entire Vietnam War did

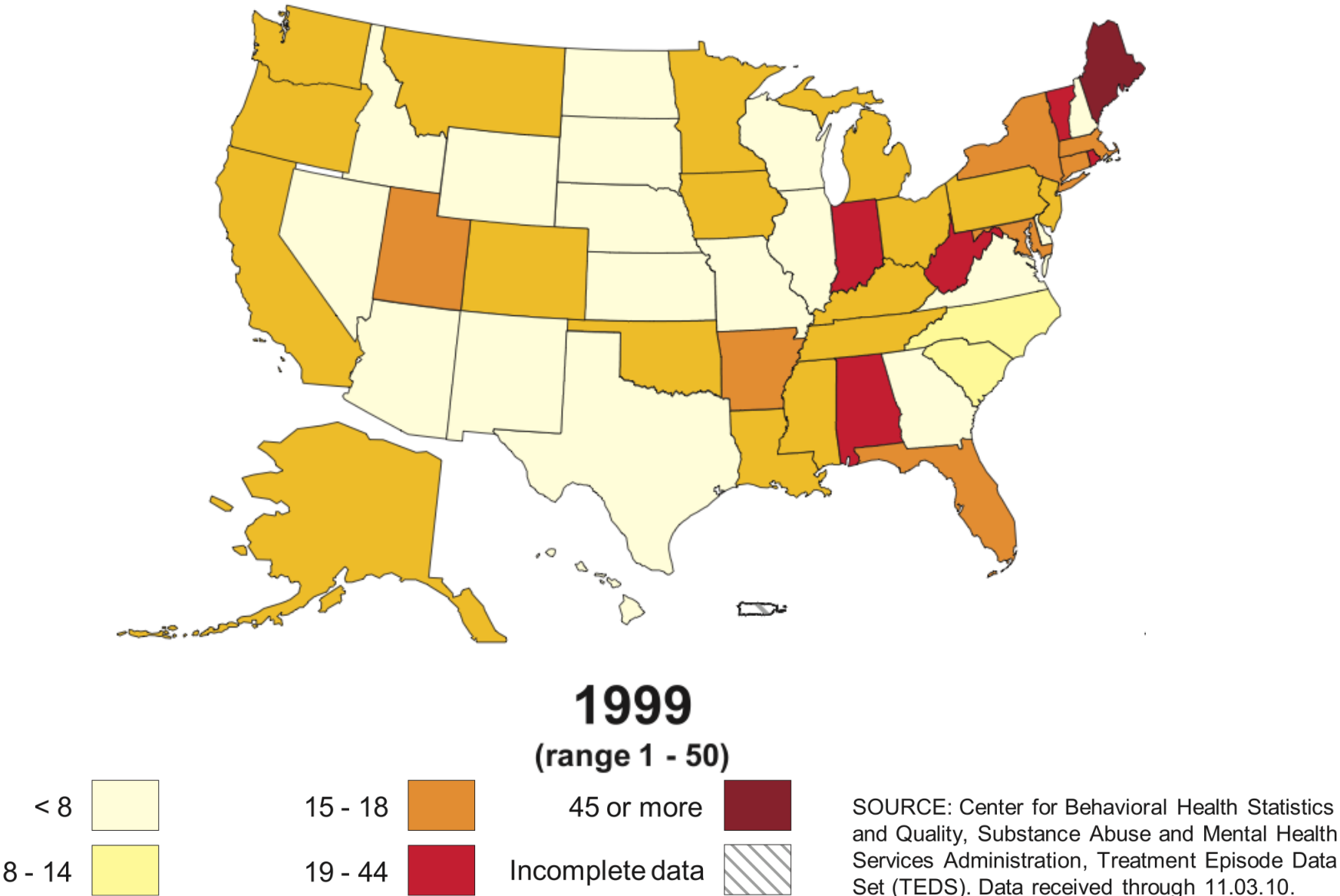
Dramatic Increases in Maternal Opioid Use and Neonatal Abstinence Syndrome

Children of the Opioid Epidemic Are Flooding Foster Homes. America Is Turning a Blind Eye.

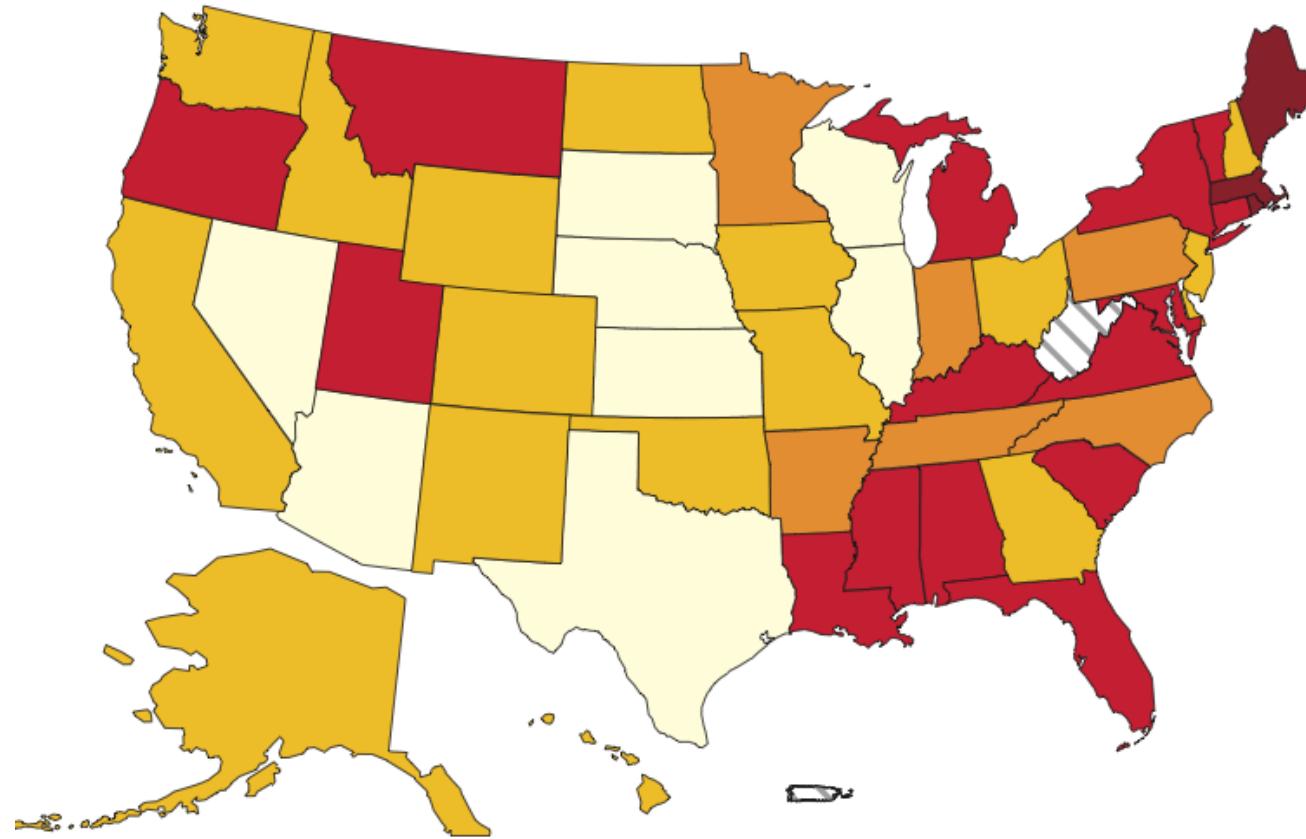
**Drug overdose deaths jump
in 2023 to 105,000, a record
high, CDC says**

How the opioid crisis decimated the American workforce

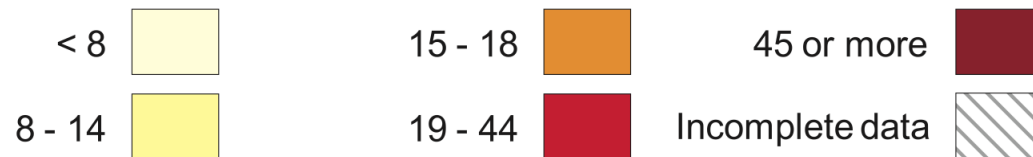
Primary non-heroin opiates/synthetics admission rates, by State
(per 100,000 population aged 12 and over)



Primary non-heroin opiates/synthetics admission rates, by State (per 100,000 population aged 12 and over)

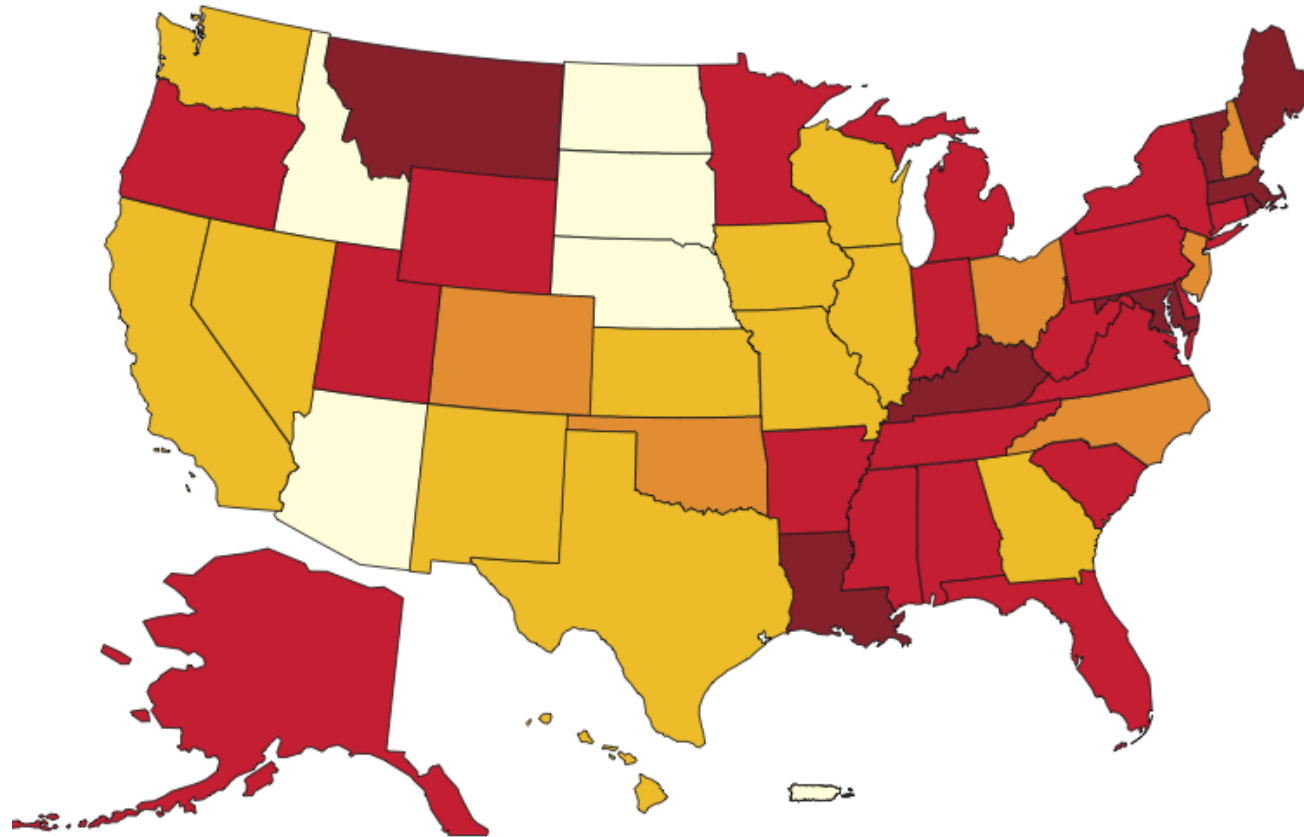


2001
(range 1 – 71)



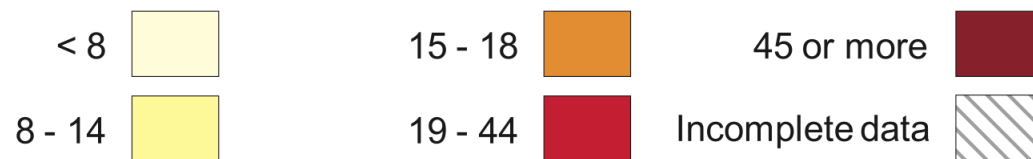
SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

Primary non-heroin opiates/synthetics admission rates, by State (per 100,000 population aged 12 and over)



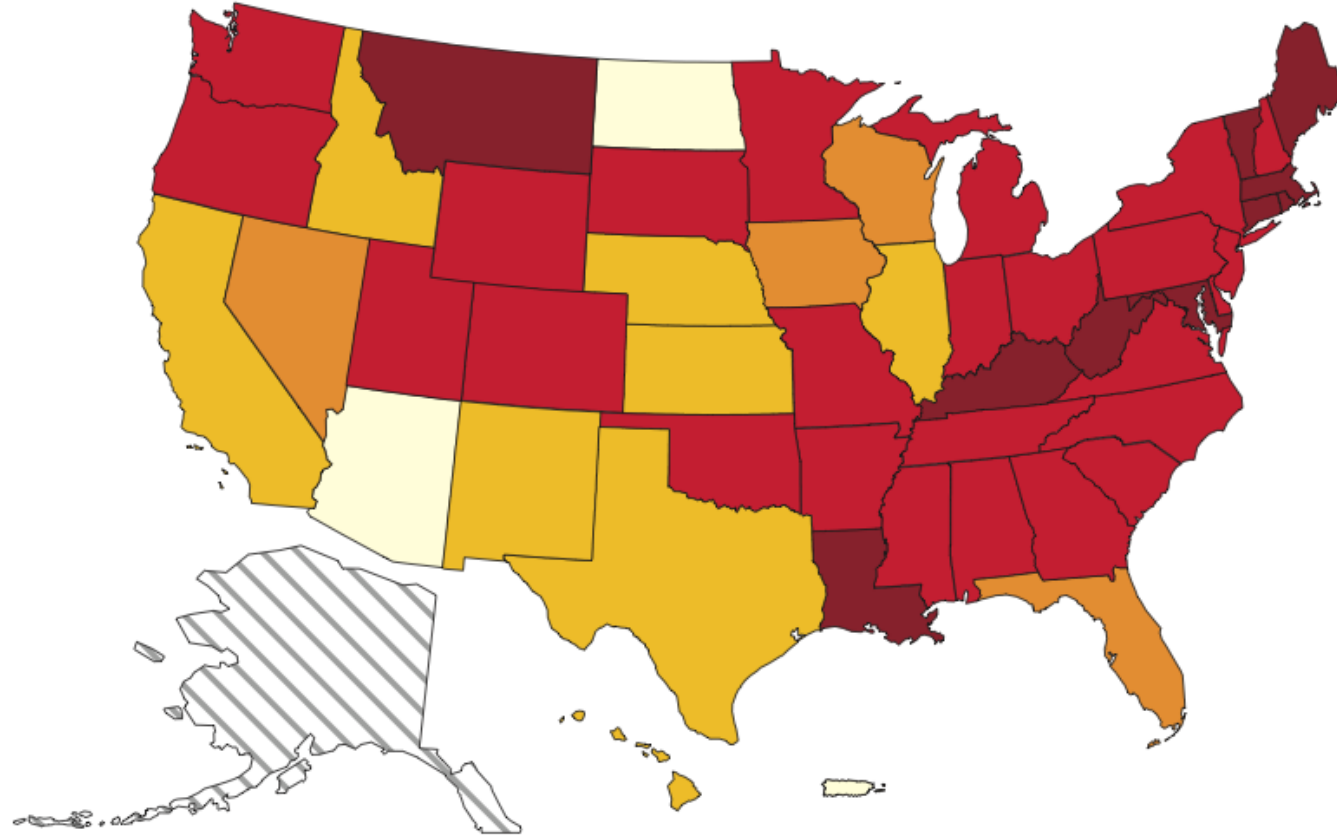
2003

(range 2 – 139)

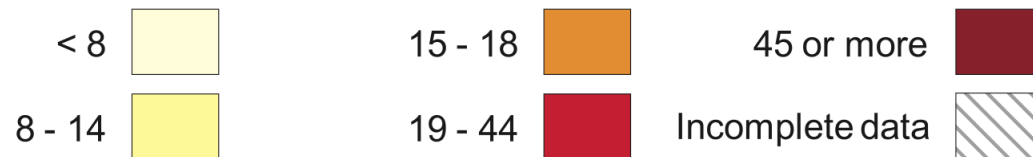


SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

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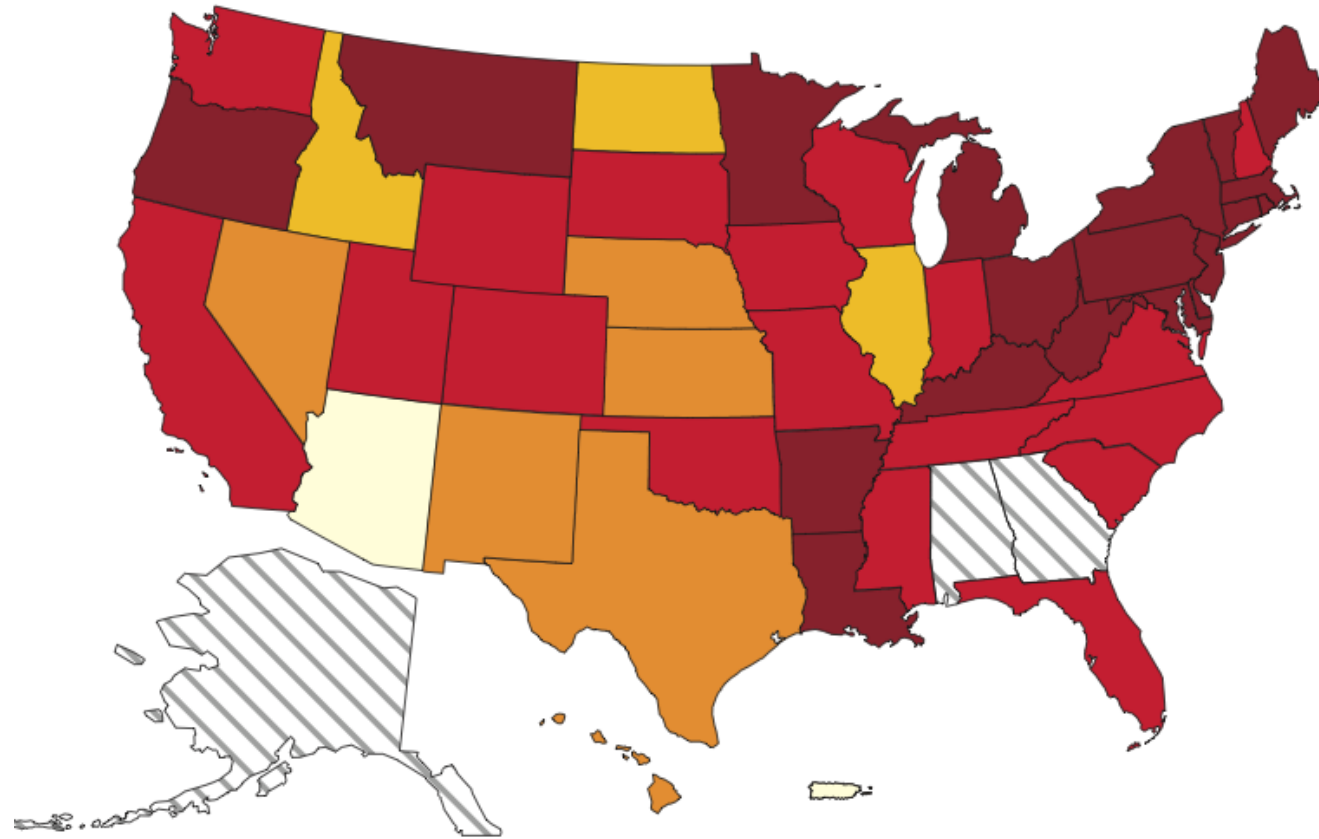


2005
(range 0 – 214)



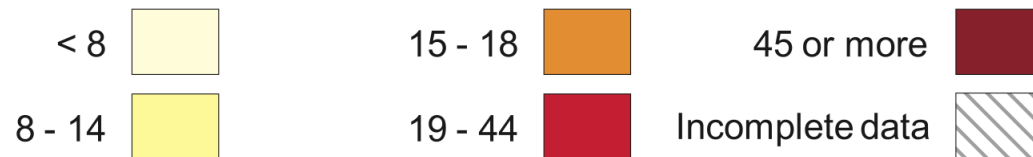
SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

Primary non-heroin opiates/synthetics admission rates, by State (per 100,000 population aged 12 and over)



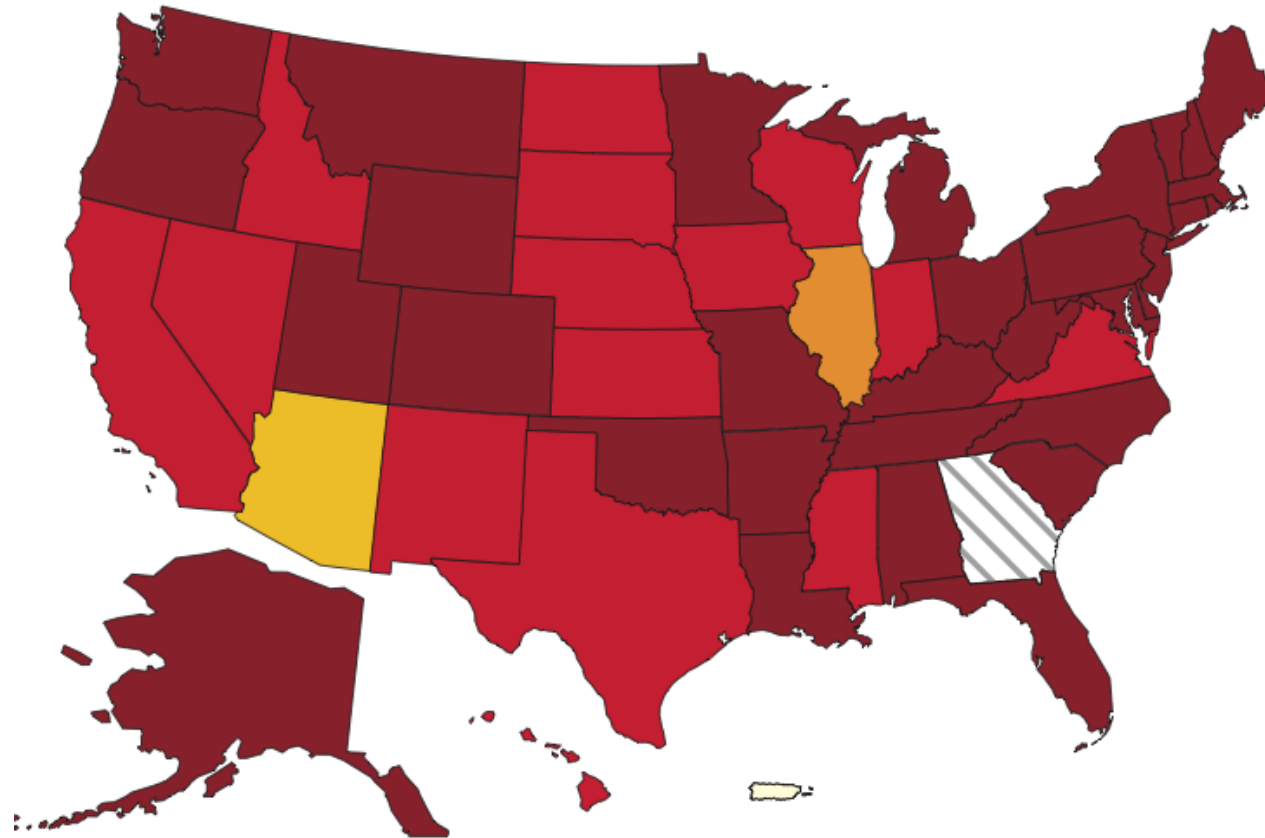
2007

(range 1 – 340)

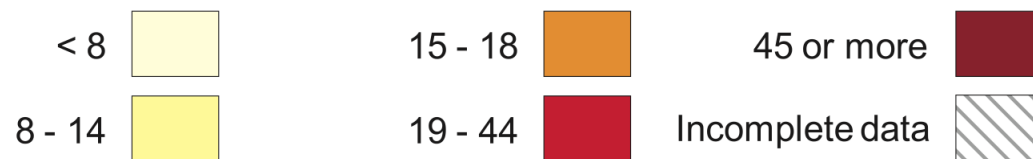


SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

Primary non-heroin opiates/synthetics admission rates, by State (per 100,000 population aged 12 and over)

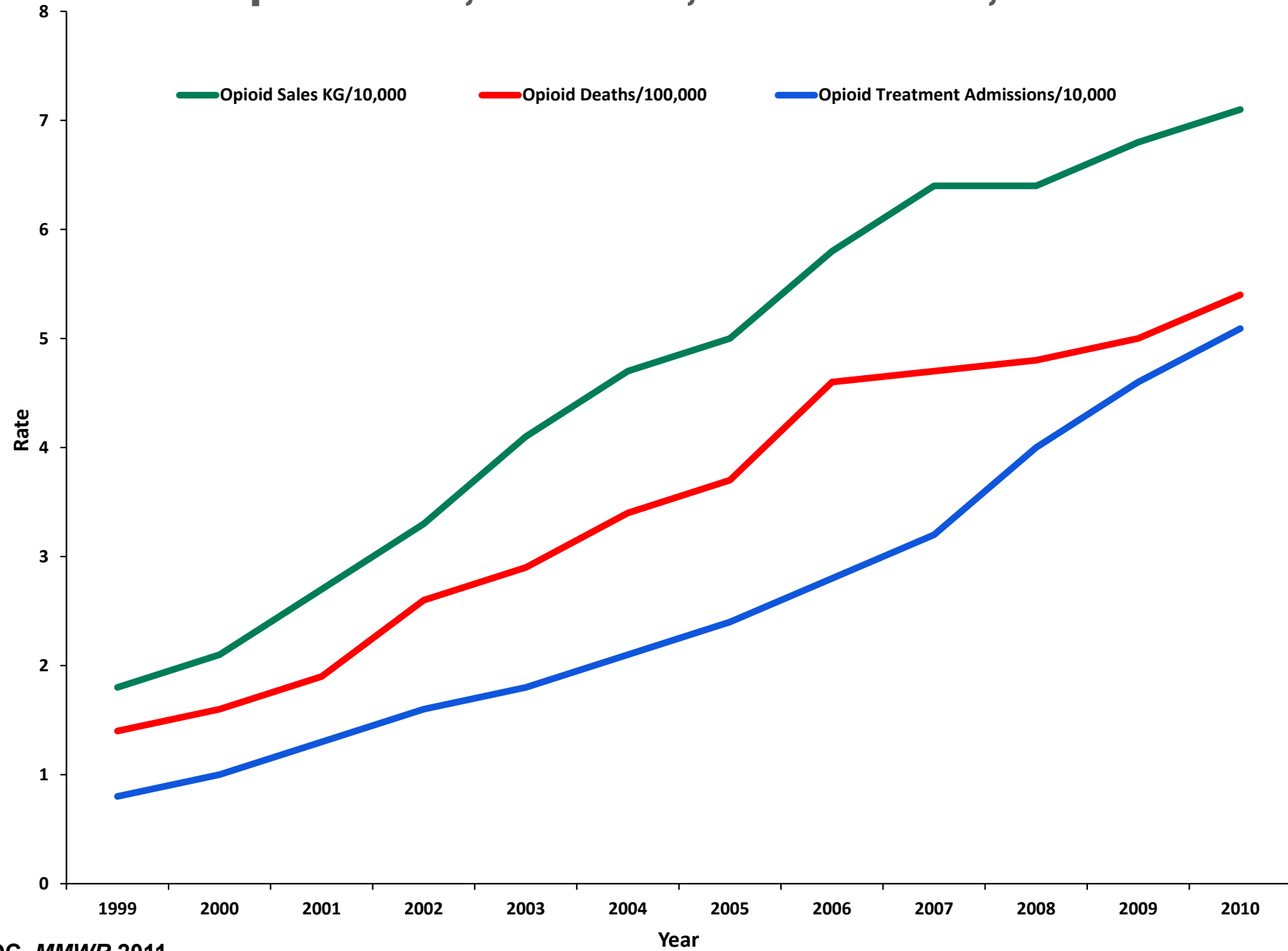


2009
(range 1 – 379)

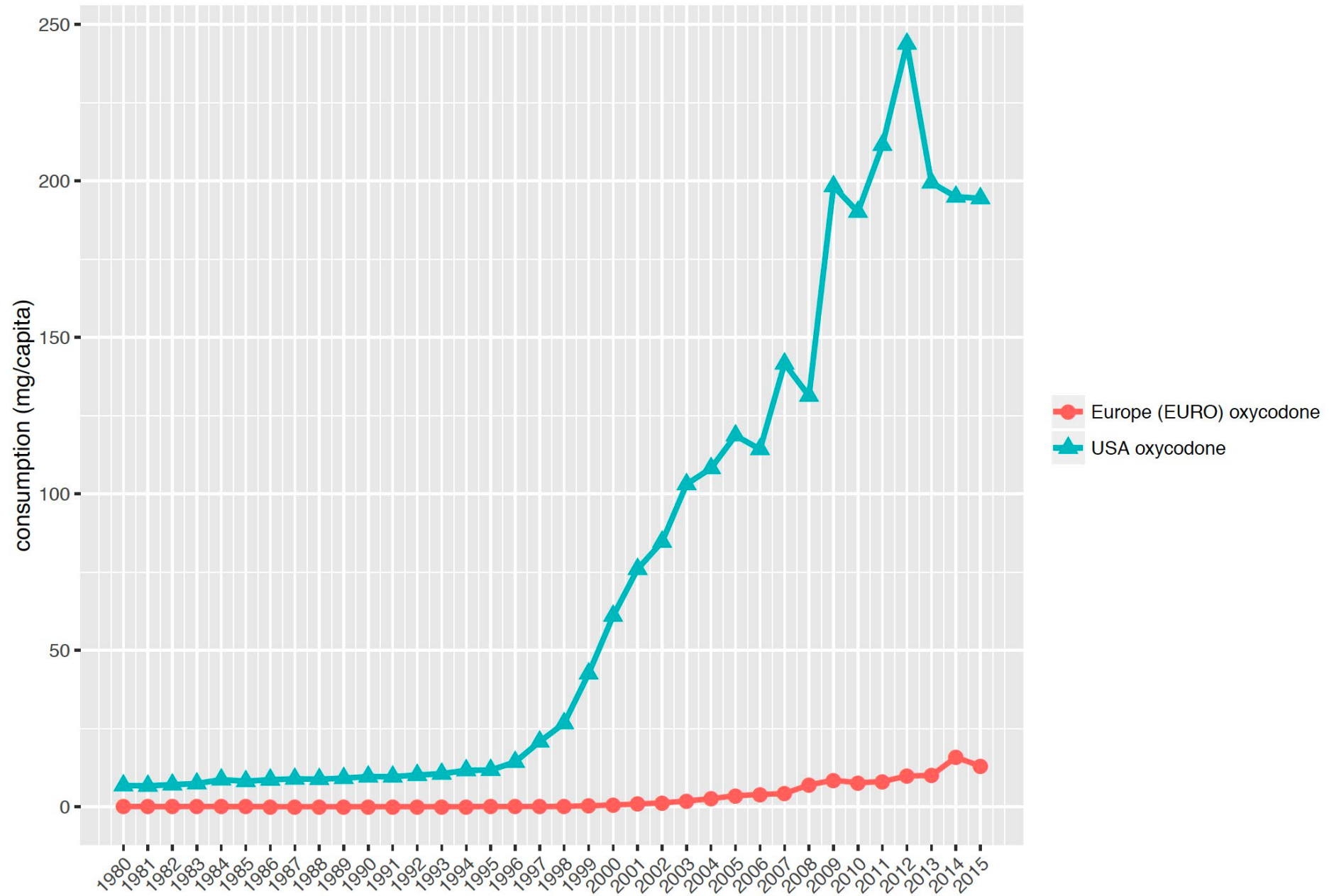


SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

Rates of Opioid Sales, OD Deaths, and Treatment, 1999–2010



USA oxycodone consumption (mg/capita) 1980–2015



Industry-funded “educational” messages

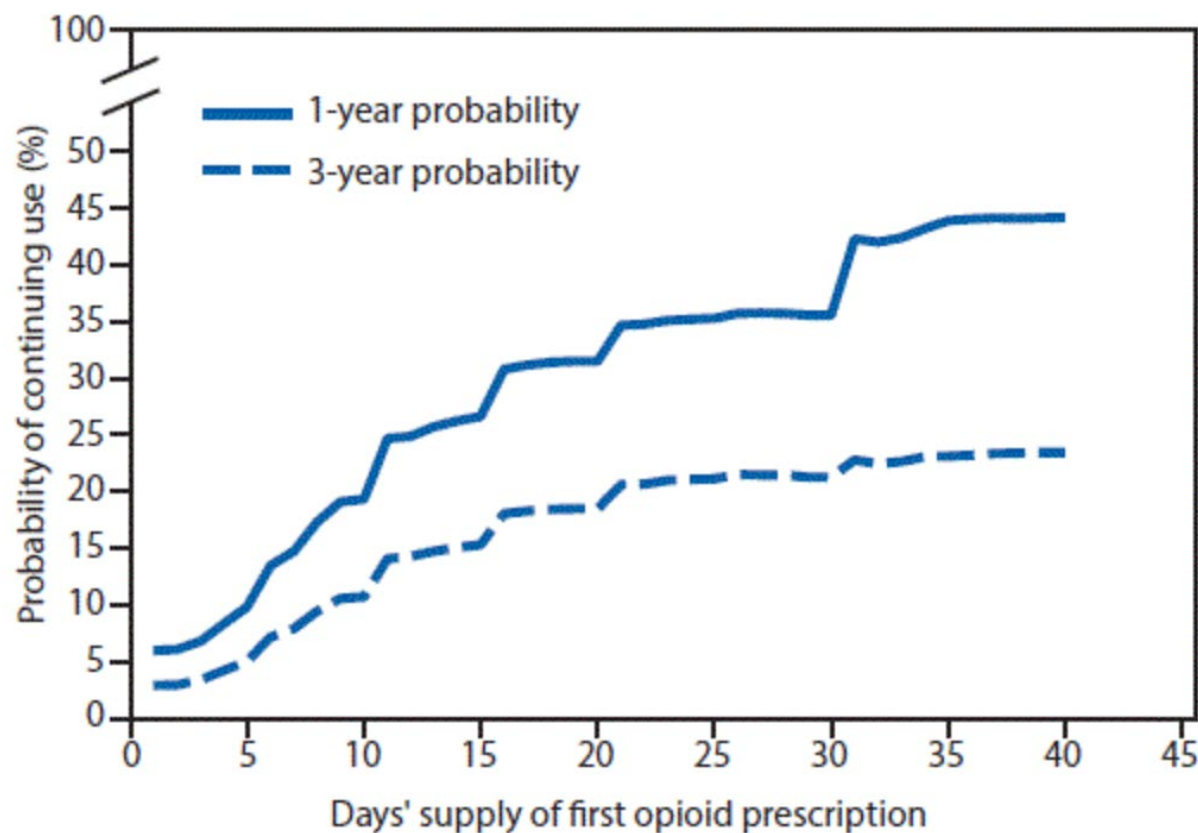
- ***Physicians are needlessly allowing patients to suffer because of “opiophobia.”***
- ***Opioid addiction is rare in pain patients.***
- ***Opioids can be easily discontinued.***
- ***Opioids are safe and effective for chronic pain.***

Industry-funded organizations campaigned for greater use of opioids

- ***Pain Patient Groups***
- ***Professional Societies***
- ***The Joint Commission***
- ***The Federation of State Medical Boards***



One- and 3-year probabilities of continued opioid use among opioid-naïve patients, by number of days' supply* of the first opioid prescription — United States, 2006–2015



Source: Shah A, Hayes CJ, Martin BC. Characteristics of Initial Prescription Episodes and Likelihood of Long-Term Opioid Use — United States, 2006–2015. MMWR Morb Mortal Wkly Rep 2017;66:265–269.

Effect of a Single Dose of Oral Opioid and Nonopioid Analgesics on Acute Extremity Pain in the Emergency Department A Randomized Clinical Trial

Andrew K. Chang, MD, MS; Polly E. Bijur, PhD; David Esses, MD; Douglas P. Barnaby, MD, MS; Jesse Baer, MD

Key Points

Question Do any of 4 oral combination analgesics (3 with different opioids and 1 opioid-free) provide more effective reduction of moderate to severe acute extremity pain in the emergency department (ED)?

Findings In this randomized clinical trial of 411 ED patients with acute extremity pain (mean score, 8.7 on the 11-point numerical rating scale), there was no significant difference in pain reduction at 2 hours. Mean pain scores decreased by 4.3 with ibuprofen and acetaminophen (paracetamol); 4.4 with oxycodone and acetaminophen; 3.5 with hydrocodone and acetaminophen; and 3.9 with codeine and acetaminophen.

Meaning For adult ED patients with acute extremity pain, there were no clinically important differences in pain reduction at 2 hours with ibuprofen and acetaminophen or 3 different opioid and acetaminophen combination analgesics.

Table 2. Numerical Rating Scale (NRS) Pain Scores and Decline in Pain Scores by Treatment Group

	NRS Pain Score, Mean (95% CI) ^a				P Value ^f
	Ibuprofen and Acetaminophen ^b	Oxycodone and Acetaminophen ^c	Hydrocodone and Acetaminophen ^d	Codeine and Acetaminophen ^e	
No. of patients ^g	101	104	103	103	
Primary end point: decline in score to 2 h	4.3 (3.6 to 4.9)	4.4 (3.7 to 5.0)	3.5 (2.9 to 4.2)	3.9 (3.2 to 4.5)	.053
Baseline score	8.9 (8.5 to 9.2)	8.7 (8.3 to 9.0)	8.6 (8.3 to 9.0)	8.6 (8.2 to 8.9)	.47
Score at 1 h	5.9 (5.3 to 6.6)	5.5 (4.9 to 6.2)	6.2 (5.6 to 6.9)	5.9 (5.2 to 6.5)	.25
Score at 2 h	4.6 (3.9 to 5.3)	4.3 (3.6 to 5.0)	5.1 (4.5 to 5.8)	4.7 (4.0 to 5.4)	.13
Decline in score to 1 h	2.9 (2.4 to 3.5)	3.1 (2.6 to 3.7)	2.4 (1.8 to 3.0)	2.7 (2.1 to 3.3)	.13

Systematic review of the relative efficacy of non-steroidal anti-inflammatory drugs and opioids in the treatment of acute renal colic

Anna Holdgate, Tamara Pollock

Results 20 trials totalling 1613 participants were identified. Both NSAIDs and opioids led to clinically important reductions in patient reported pain scores. Pooled analysis of six trials showed a greater reduction in pain scores for patients treated with NSAIDs than with opioids. Patients treated with NSAIDs were significantly less likely to require rescue analgesia (relative risk 0.75, 95% confidence interval 0.61 to 0.93). Most trials showed a higher incidence of adverse events in patients treated with opioids. Compared with patients treated with opioids, those treated with NSAIDs had significantly less vomiting (0.35, 0.23 to 0.53). Pethidine was associated with a higher rate of vomiting.

Conclusions Patients receiving NSAIDs achieve greater reductions in pain scores and are less likely to require further analgesia in the short term than those receiving opioids. Opioids, particularly pethidine, are associated with a higher rate of vomiting.

What is already known on this topic

Both non-steroidal anti-inflammatory drugs (NSAIDs) and opioids provide analgesia in acute renal colic

NSAIDs have well recognised side effects

What this study adds

NSAIDs achieve slightly greater reductions in pain scores than opioids in patients with renal colic

Patients with renal colic are less likely to need rescue analgesia if treated with NSAIDs

Opioids, particularly pethidine, are associated with a higher rate of vomiting and other adverse effects

BMJ, doi:10.1136/bmj.38119.581991.55 (published 3 June 2004)

Opioids After Surgery in the United States Versus the Rest of the World

The International Patterns of Opioid Prescribing (iPOP) Multicenter Study

Objective: The International Patterns of Opioid Prescribing study compares postoperative opioid prescribing patterns in the United States (US) versus the rest of the world.

Summary of Background Data: The US is in the middle of an unprecedented opioid epidemic. Diversion of unused opioids contributes to the opioid epidemic.

Methods: Patients ≥ 16 years old undergoing appendectomy, cholecystectomy, or inguinal hernia repair in 14 hospitals from 8 countries during a 6-month period were included. Medical records were systematically reviewed to identify: (1) preoperative, intraoperative, and postoperative characteristics, (2) opioid intake within 3 months preoperatively, (3) opioid prescription upon discharge, and (4) opioid refills within 3 months postoperatively. The median/range and mean/standard deviation of number of pills and OME were compared between the US and non-US patients.

Results: A total of 4690 patients were included. The mean age was 49 years, 47% were female, and 4% had opioid use history. Ninety-one percent of US patients were prescribed opioids, compared to 5% of non-US patients ($P < 0.001$). The median number of opioid pills and OME prescribed were 20 (0–135) and 150 (0–1680) mg for US versus 0 (0–50) and 0 (0–600) mg for

non-US patients, respectively (both $P < 0.001$). The mean number of opioid pills and OME prescribed were 23.1 ± 13.9 in US and 183.5 ± 133.7 mg versus 0.8 ± 3.9 and 4.6 ± 27.7 mg in non-US patients, respectively (both $P < 0.001$). Opioid refill rates were 4.7% for US and 1.0% non-US patients ($P < 0.001$). **Conclusions:** US physicians prescribe alarmingly high amounts of opioid medications postoperatively. Further efforts should focus on limiting opioid prescribing and emphasize non-opioid alternatives in the US.

Keywords: analgesics, narcotics, opioid, postoperative pain, prescription
(*Ann Surg* 2020;xx:xxx–xxx)

The United States (US) is in the midst of an unprecedented opioid epidemic. In 2016, drug overdoses (mostly opioids) resulted in 65,000 deaths, a number much higher than that caused by human immunodeficiency disease in 1995, at the peak of that epidemic.¹ The etiology of the opioid epidemic that commenced 2 decades ago is multifactorial and includes misleading marketing strategies by a few pharmaceutical companies that advocated for opioids as a risk-free optimal solution to pain, and a concomitant recognition by the

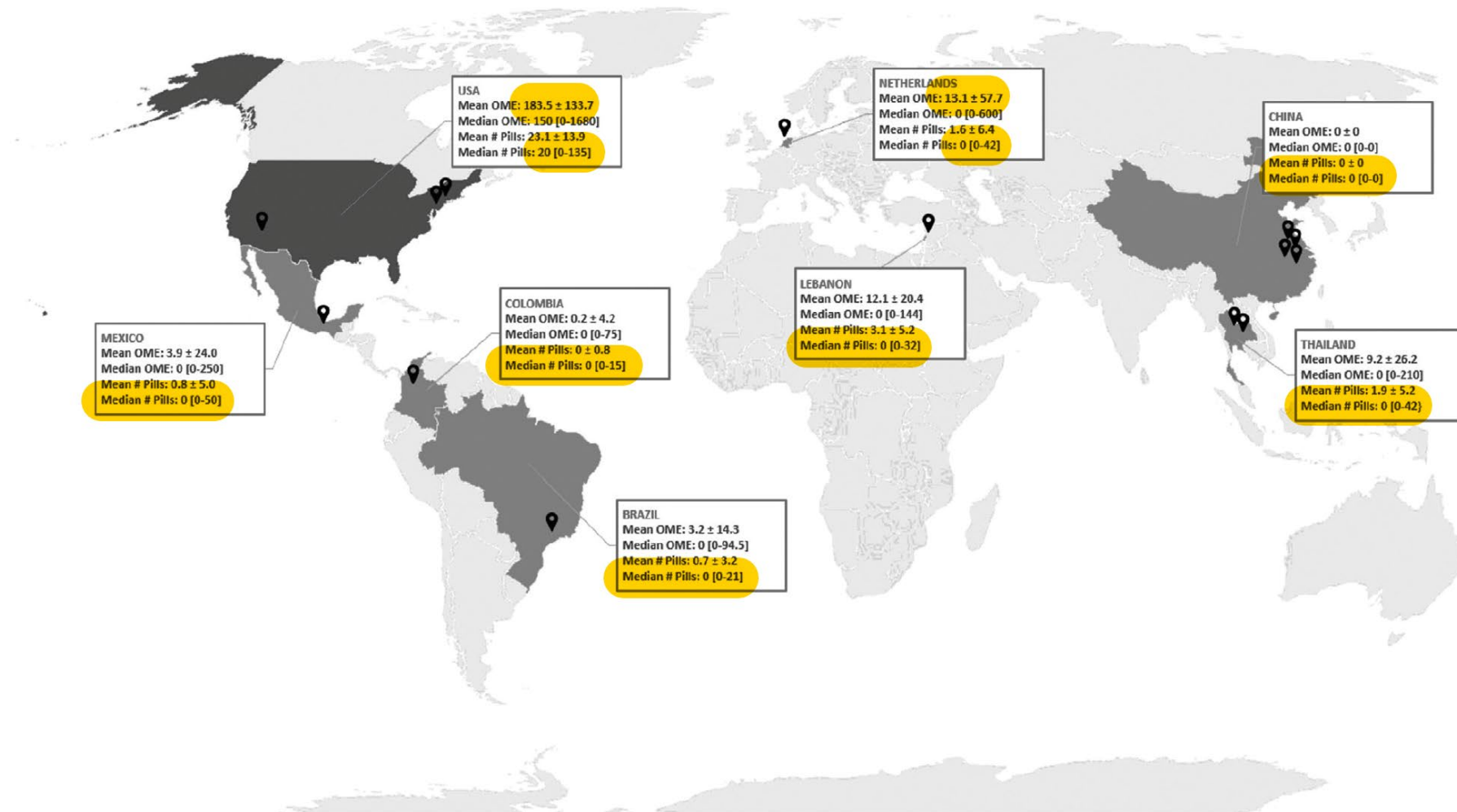


FIGURE 1. Site-specific map detailing opioid pills prescribed and OME in the United States versus internationally. OME indicates oral morphine equivalents.

Kaafarani HMA, Han K, El Moheb M, et al. Opioids After Surgery in the United States Versus the Rest of the World: The International Patterns of Opioid Prescribing (iPOP) Multicenter Study [published online ahead of print, 2020 Jul 9]. Ann Surg.

Association of Opioid Prescriptions From Dental Clinicians for US Adolescents and Young Adults With Subsequent Opioid Use and Abuse

Alan R. Schroeder, MD; Melody Dehghan, BA; Thomas B. Newman, MD, MPH;
Jason P. Bentley, PhD; K. T. Park, MD, MS

[+ Supplemental content](#)

IMPORTANCE Through prescription writing, dental clinicians are a potential source of initial opioid exposure and subsequent abuse for adolescents and young adults.

OBJECTIVE To examine the association between index dental opioid prescriptions from dental clinicians for opioid-naïve adolescents and young adults in 2015 and new persistent use and subsequent diagnoses of abuse in this population.

DESIGN, SETTING, AND PARTICIPANTS This retrospective cohort study examined outpatient opioid prescriptions for patients aged 16 to 25 years in the Optum Research Database in 2015. Prescriptions were linked by National Provider Identifier number to a clinician category.

EXPOSURES Individuals were included in the index dental opioid (opioid-exposed) cohort if they filled an opioid prescription from a dental clinician in 2015, had continuous health plan coverage and no record of opioid prescriptions for 12 months before receiving the prescription, and had 12 months of health plan coverage after receiving the prescription. Two age- and sex-matched opioid-nonexposed control individuals were selected for each opioid-exposed individual and were assigned a corresponding phantom prescription date.

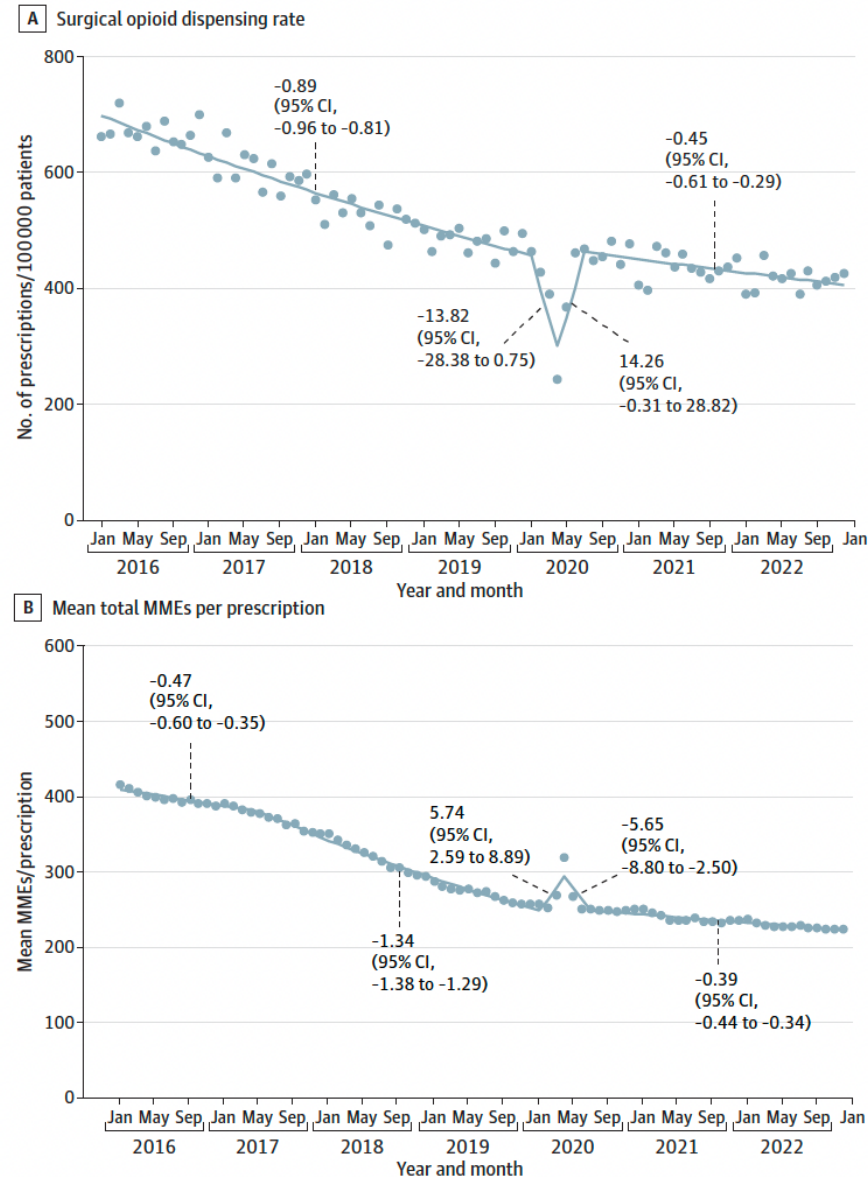
MAIN OUTCOMES AND MEASURES Receipt of an opioid prescription within 90 to 365 days, a health care encounter diagnosis associated with opioid abuse within 365 days, and all-cause mortality within 365 days of the index opioid or phantom prescription date.

RESULTS Among 754 002 individuals with continuous enrollment in 2015, 97 462 patients (12.9%) received 1 or more opioid prescriptions, of whom 29 791 (30.6%) received prescriptions supplied by a dental clinician. The opioid-exposed cohort included 14 888 participants (7882 women [52.9%], 11 273 white [75.7%], with mean [SD] age, 21.8 [2.4] years), and the randomly selected opioid-nonexposed cohort included 29 776 participants (15 764 women [52.9%], 20 078 [67.4%] white, with mean [SD] age, 21.8 [2.4] years). Among the 14 888 individuals in the index dental opioid cohort, 1021 (6.9%) received another opioid prescription 90 to 365 days later compared with 30 of 29 776 (0.1%) opioid-nonexposed controls (adjusted absolute risk difference, 6.8%; 95% CI, 6.3%-7.2%), and 866 opioid-exposed individuals (5.8%) experienced 1 or more subsequent health care encounters with an opioid abuse-related diagnosis compared with 115 opioid-nonexposed controls (0.4%) (adjusted absolute risk difference, 5.3%; 95% CI, 5.0%-5.7%). There was only 1 death in each cohort.

CONCLUSIONS AND RELEVANCE The findings suggest that a substantial proportion of adolescents and young adults are exposed to opioids through dental clinicians. Use of these prescriptions may be associated with an increased risk of subsequent opioid use and abuse.

JAMA Intern Med. doi:10.1001/jamainternmed.2018.5419
Published online December 3, 2018.

Figure. Rate and Dosing of Dispensed Opioid Prescriptions From US Surgeons, 2016-2022

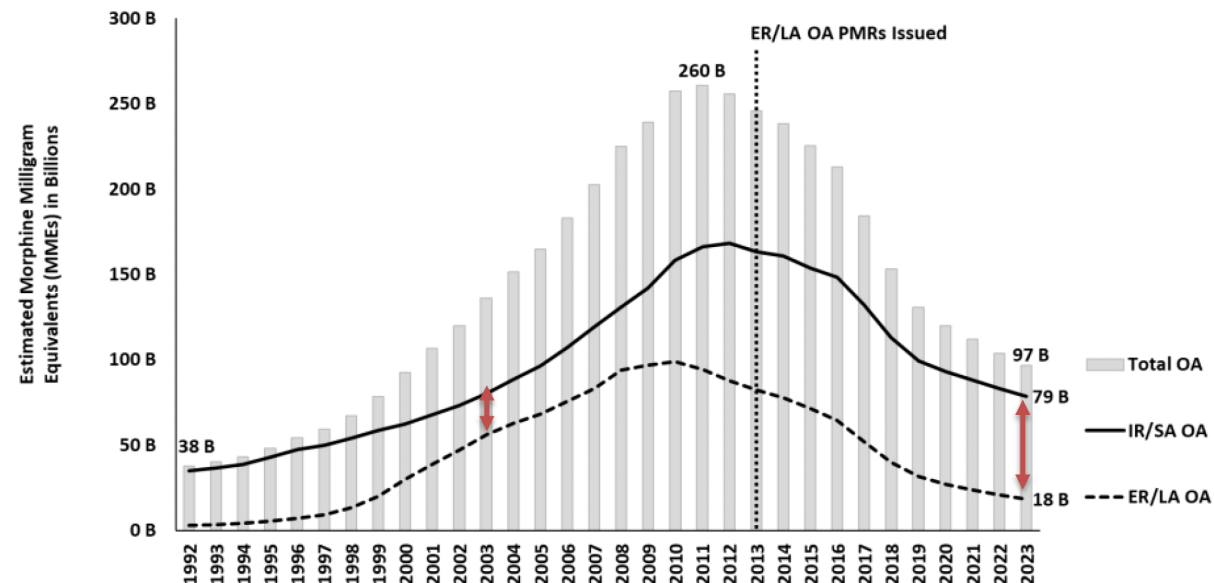


During 2016 to 2022,
the rate and size of
opioid prescriptions
from US surgeons
declined.

But these declines
were slower after mid-
2020 compared with
before 2020



Trends in Total MMEs



Nationally Estimated Annual Morphine Milligram Equivalents (MMEs) for Opioid Analgesics Dispensed From U.S. Retail and Mail-Order Pharmacies, Stratified by Formulation, 1992 to 2023.

Source: IQVIA National Prescription Audit™, U.S. Launch edition. Data years 1992-2023.

Data extracted July 2024. Sources for MME conversion factors: Centers for Disease Control and Prevention, NDC and Oral MME Conversion File, 2019 version,

<https://www.cdc.gov/drugoverdose/resources/data.html>. McPherson ML, Demystifying Opioid Conversion Calculations: A Guide for Effective Dosing, 2nd Edition, American Society of Health-System

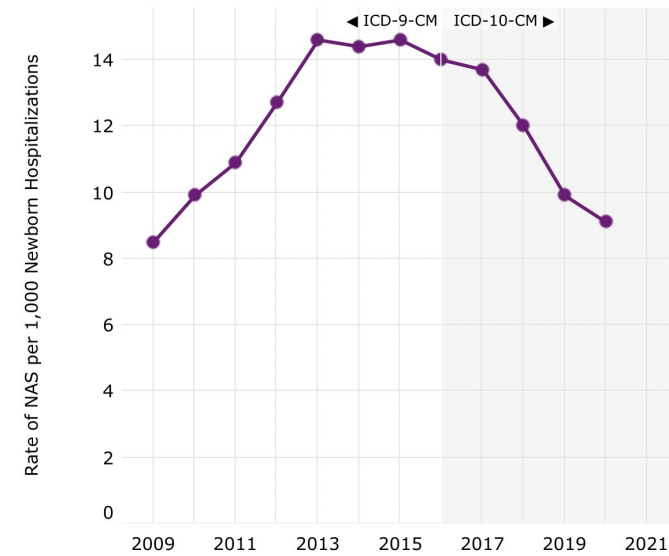
Pharmacists, 2018. Medscape, Opioid Equivalents and Conversions, <https://emedicine.medscape.com/article/2138678-overview>. GlobalRPh, Opioid conversions calc (single agent) equianalgesic,

<http://globalrph.com/narcoticonv.htm>.

Abbreviations: B, billions; ER/LA OA, extended-release/long-acting opioid analgesic; IR/SA OA, immediate-release/short-acting opioid analgesic; U.S., United States

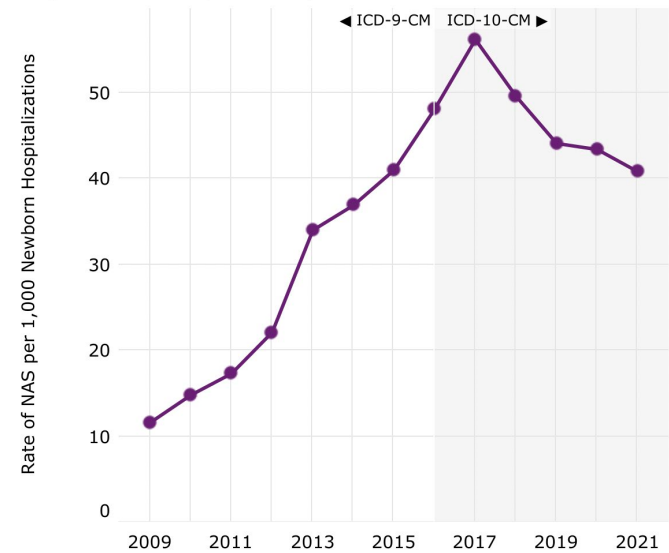
www.fda.gov

Massachusetts: Rate of NAS per 1,000 Newborn Hospitalizations by All NAS, 2009 to 2020



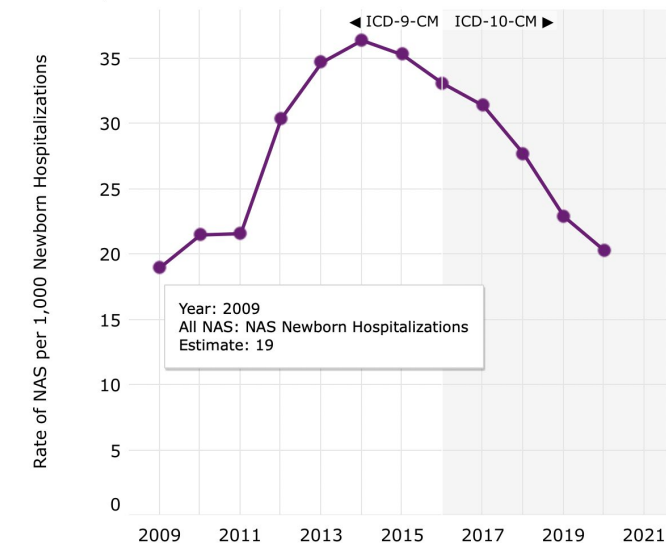
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) 2009 to 2020 (all available data as of 10/18/2022). Abbreviation: NAS, neonatal abstinence syndrome.

West Virginia: Rate of NAS per 1,000 Newborn Hospitalizations by All NAS, 2009 to 2021



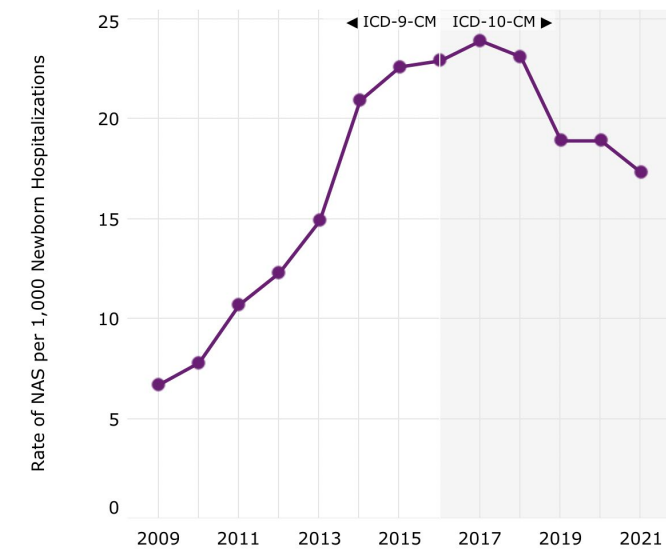
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) 2009 to 2021 (all available data as of 10/18/2022). Abbreviation: NAS, neonatal abstinence syndrome.

Maine: Rate of NAS per 1,000 Newborn Hospitalizations by All NAS, 2009 to 2020



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) 2009 to 2020 (all available data as of 10/18/2022). Abbreviation: NAS, neonatal abstinence syndrome.

Kentucky: Rate of NAS per 1,000 Newborn Hospitalizations by All NAS, 2009 to 2021



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) 2009 to 2021 (all available data as of 10/18/2022). Abbreviation: NAS, neonatal abstinence syndrome.

Controlling the epidemic:



**REDUCE THE
INCIDENCE OF OUD**



**INCREASE ACCESS
TO OUD TREATMENT**



**INTERDICTION/
SUPPLY REDUCTION**

Controlling the epidemic: Primary Prevention

Preventing a disease from occurring

Strategies for preventing OUD include:

- **Promoting more cautious prescribing**
- **Informing public about opioid risks**
- **Social marketing campaigns to dramatize negative consequences**

Controlling the epidemic: Secondary Prevention

Finding a case early in its course

Strategies include:

- **Screening & active case finding**
- **Linking people to treatment**
- **Social marketing campaigns to engage people in treatment**

Controlling the epidemic: Tertiary Prevention

Intervening to prevent the most severe outcomes

Strategies include:

- **Low threshold treatment access**
- **Syringe exchange**
- **Naloxone**

Summary

- ***The U.S. is in the midst of a severe epidemic of opioid addiction and overdose deaths, which worsened during Covid.***
- ***To bring the epidemic to an end:***
 - ***We must prevent new cases of opioid addiction***
 - ***We must improve access to treatment for people already addicted***