The U.S. Opioid Crisis: An Epidemic of Adddiction

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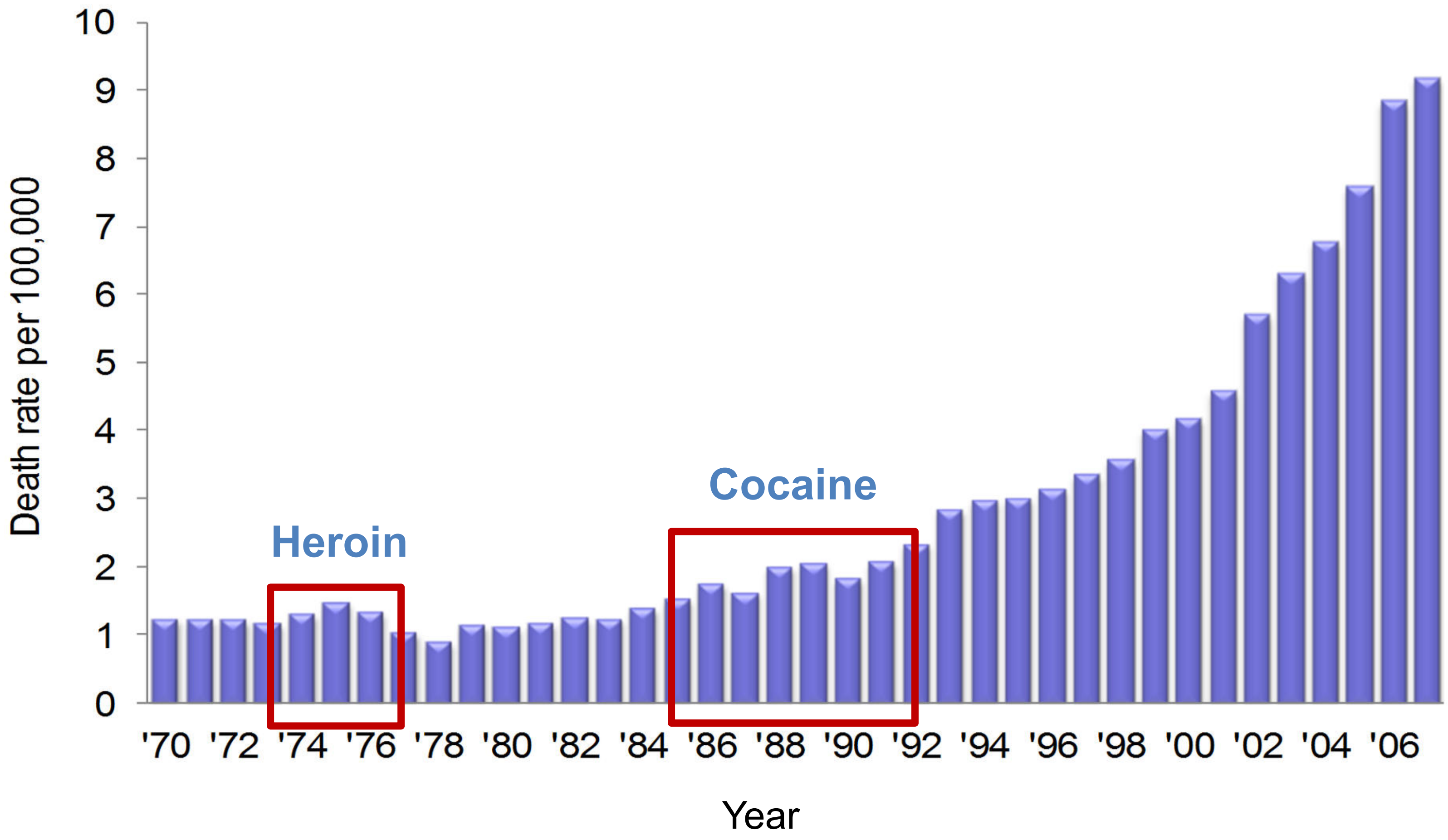
Opium

Opium

Codeine
Morphine
Thebaine

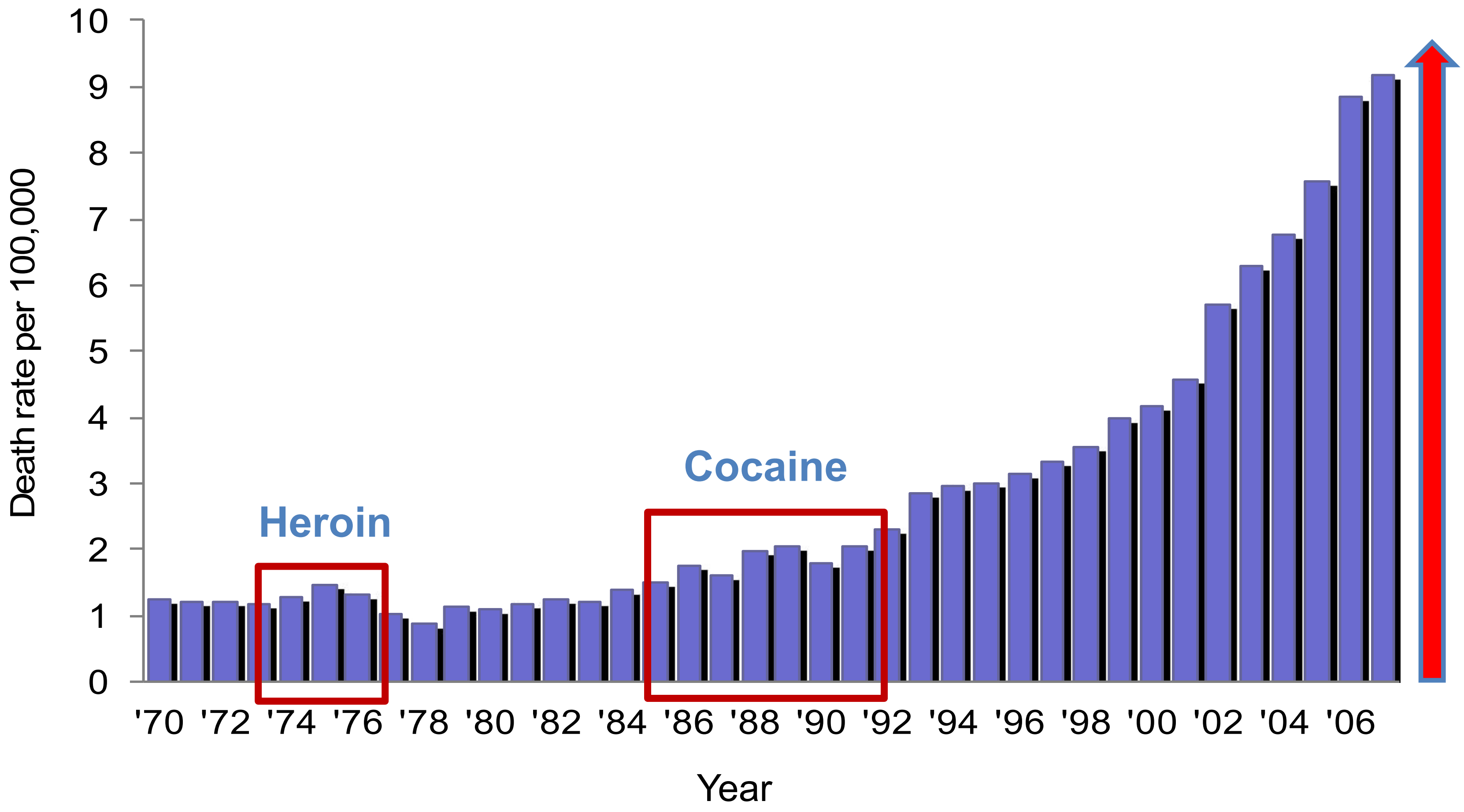
Heroin
Oxycodone
Hydrocodone
Hydromorphone
Oxymorphone

Unintentional Drug Overdose Deaths United States, 1970–2007



National Vital Statistics System, http://wonder.cdc.gov

Unintentional Drug Overdose Deaths
United States



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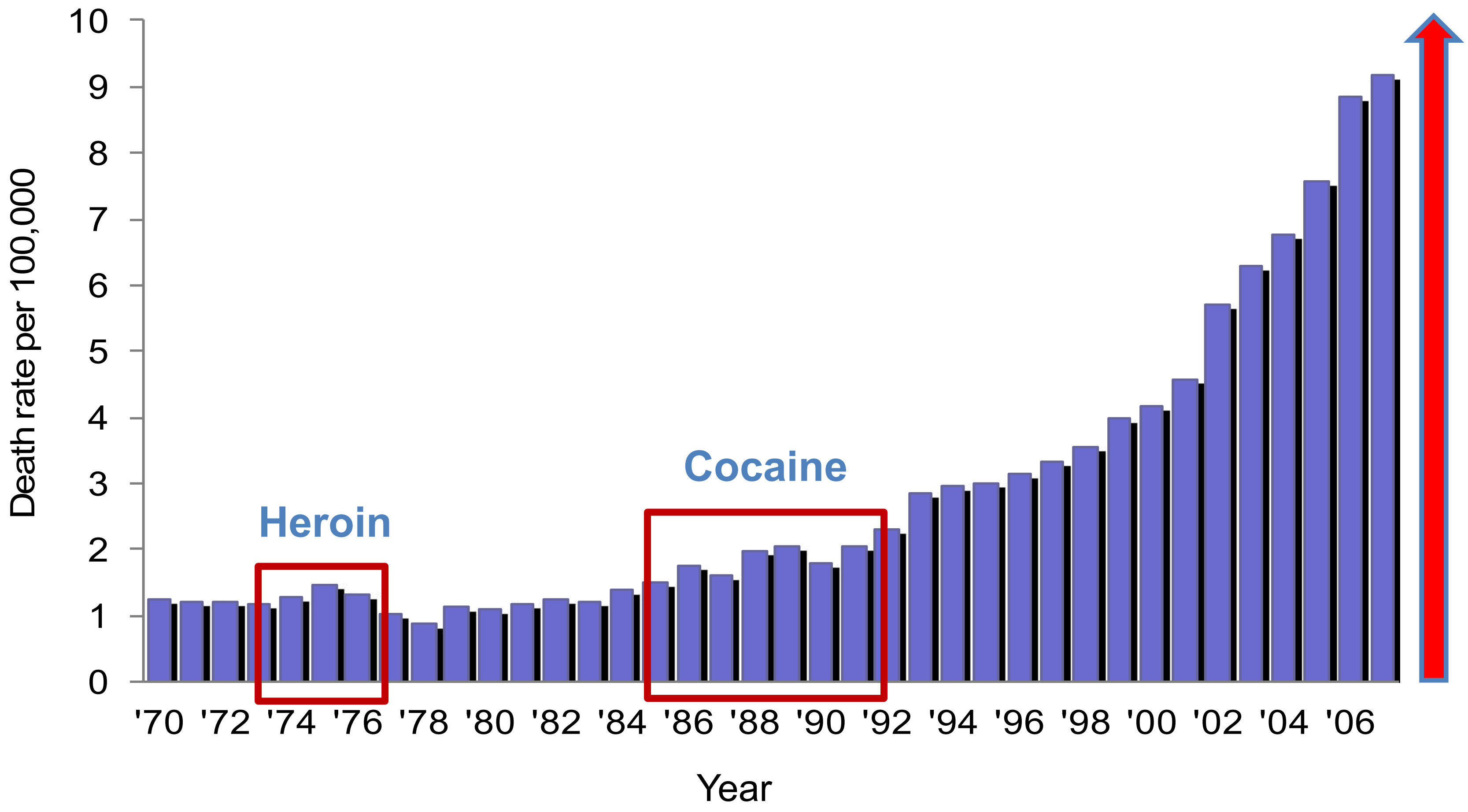
Unintentional Drug Overdose Deaths
United States



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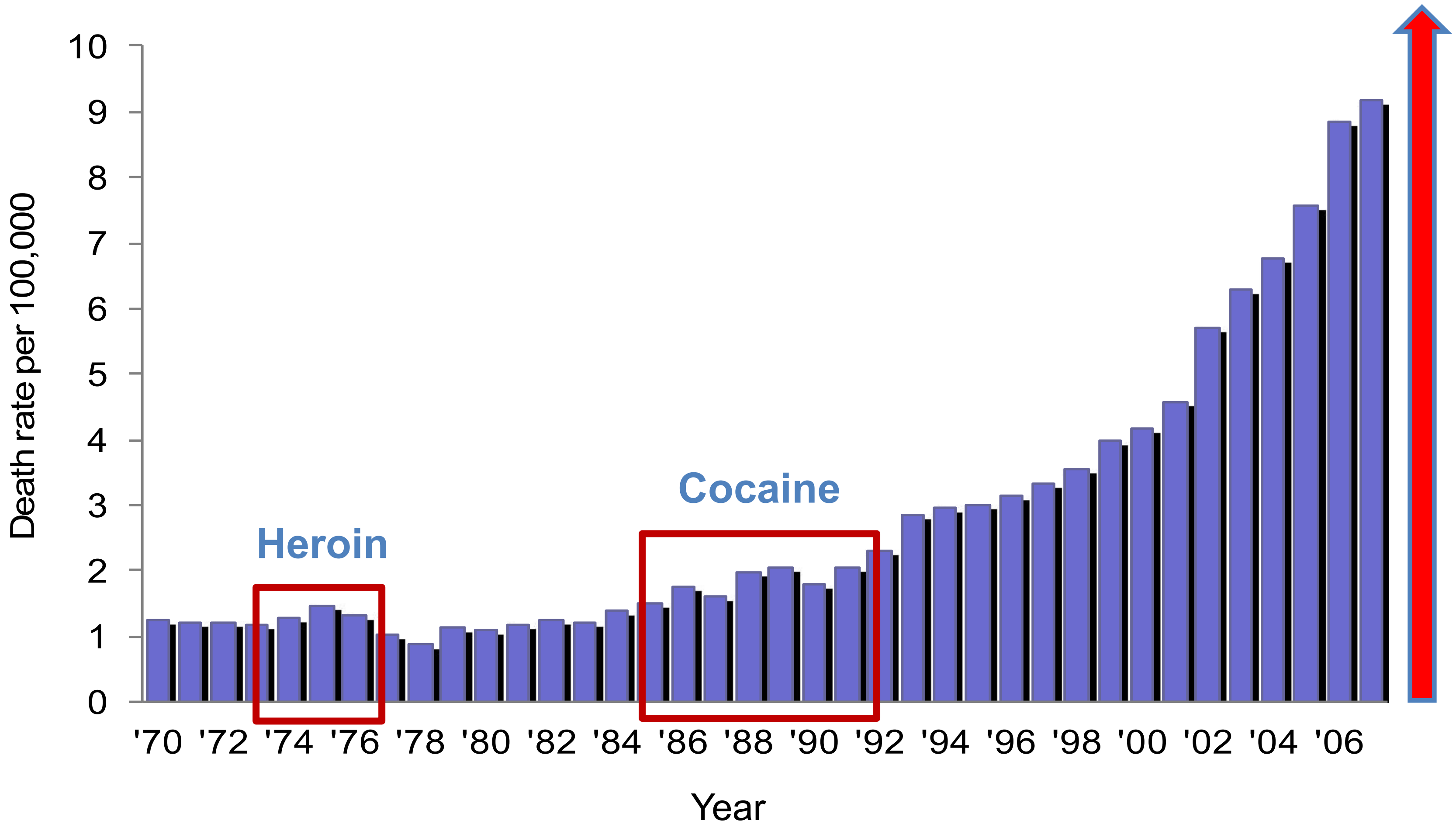
Unintentional Drug Overdose Deaths
United States



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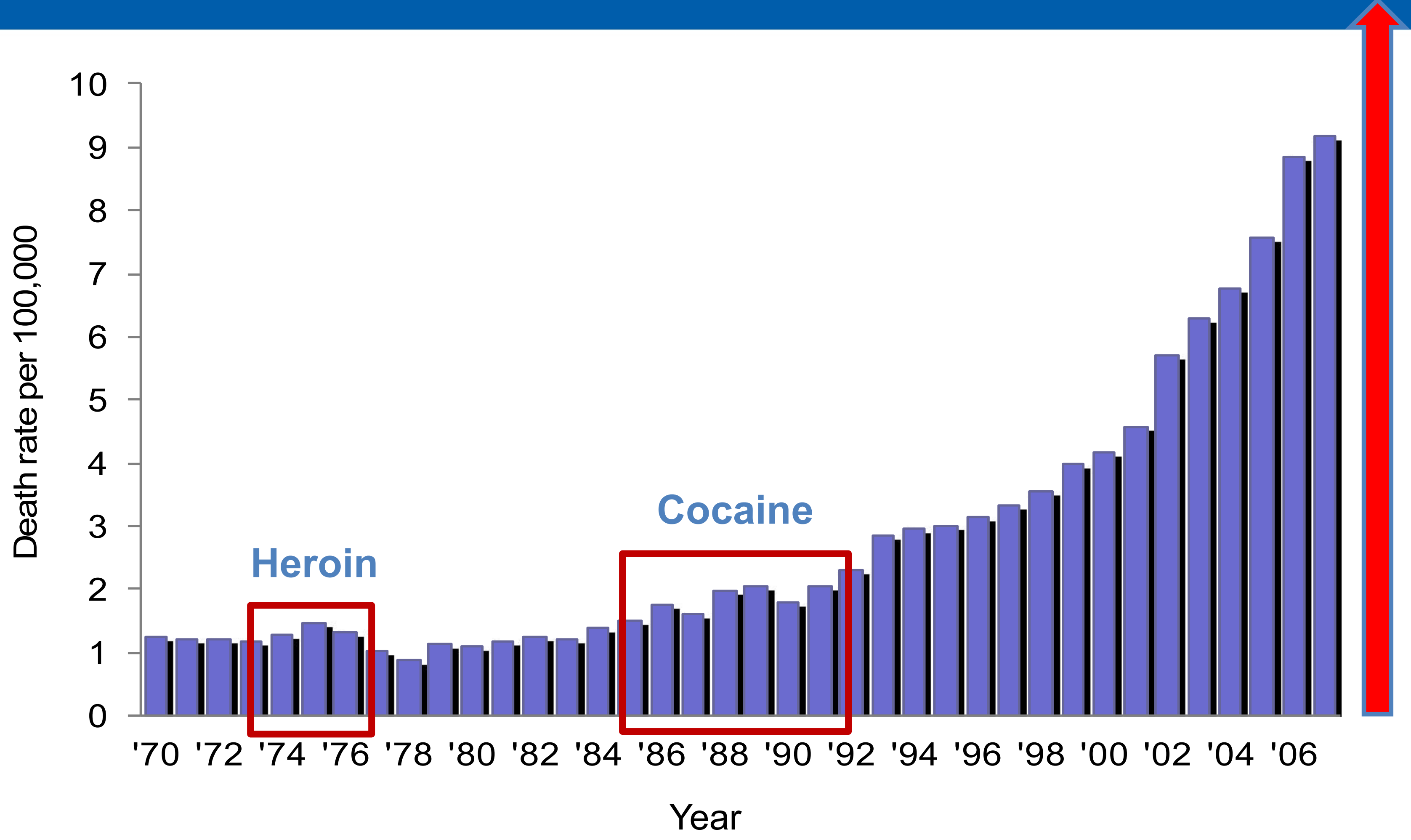
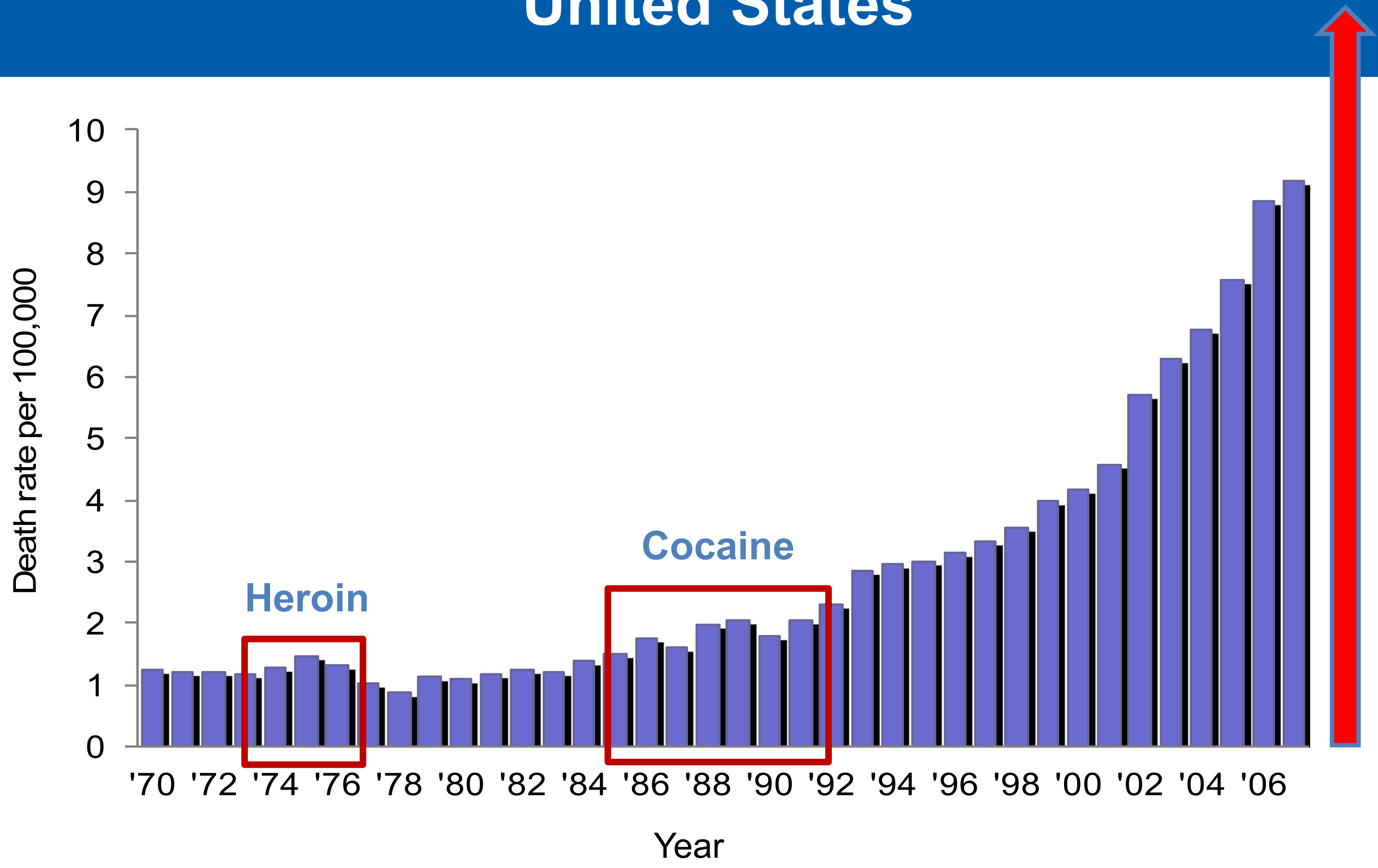
Unintentional Drug Overdose Deaths
United States



National Vital Statistics System, http://wonder.cdc.gov

Unintentional Drug Overdose Deaths
United States



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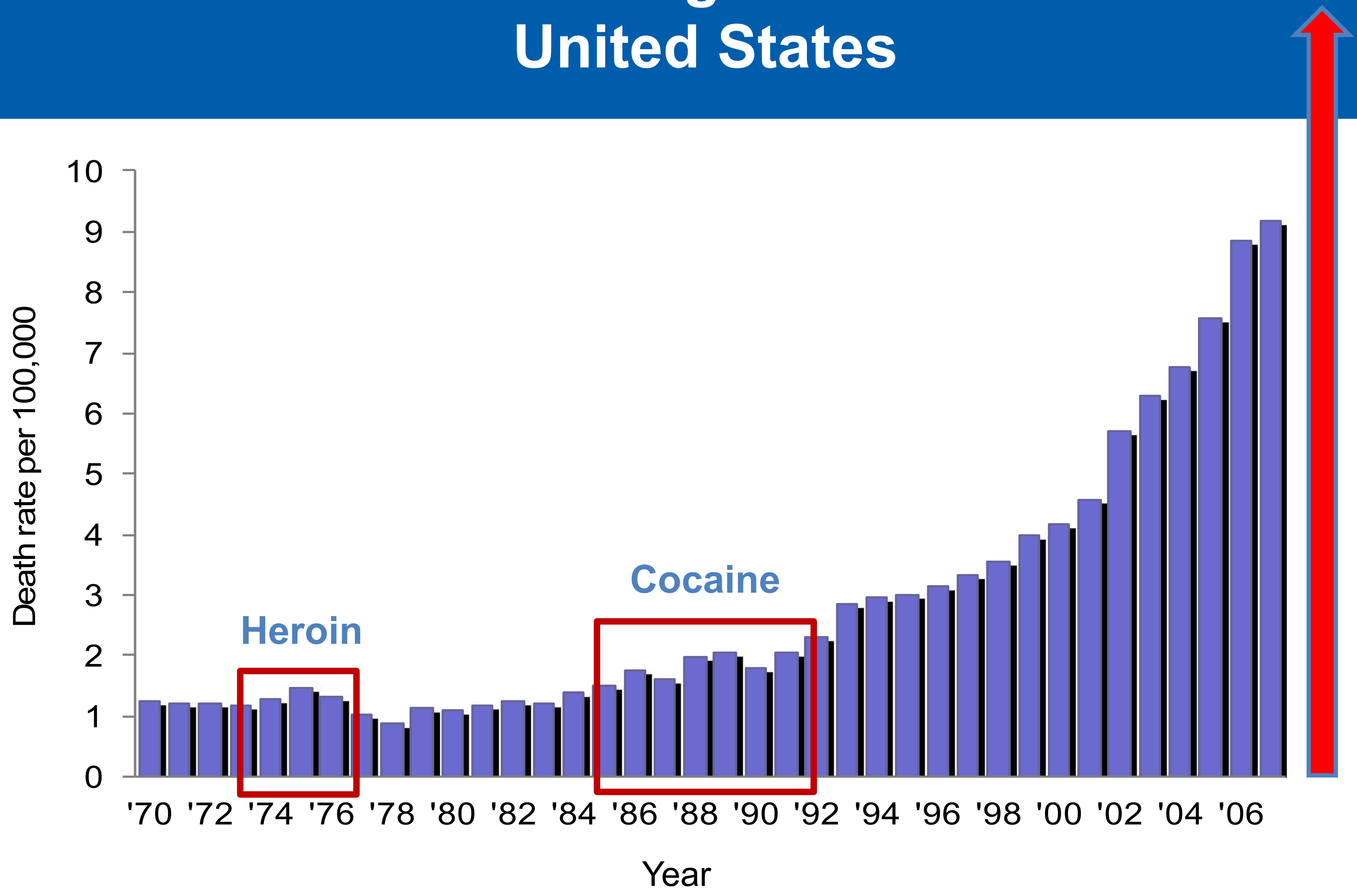
Unintentional Drug Overdose Deaths United States



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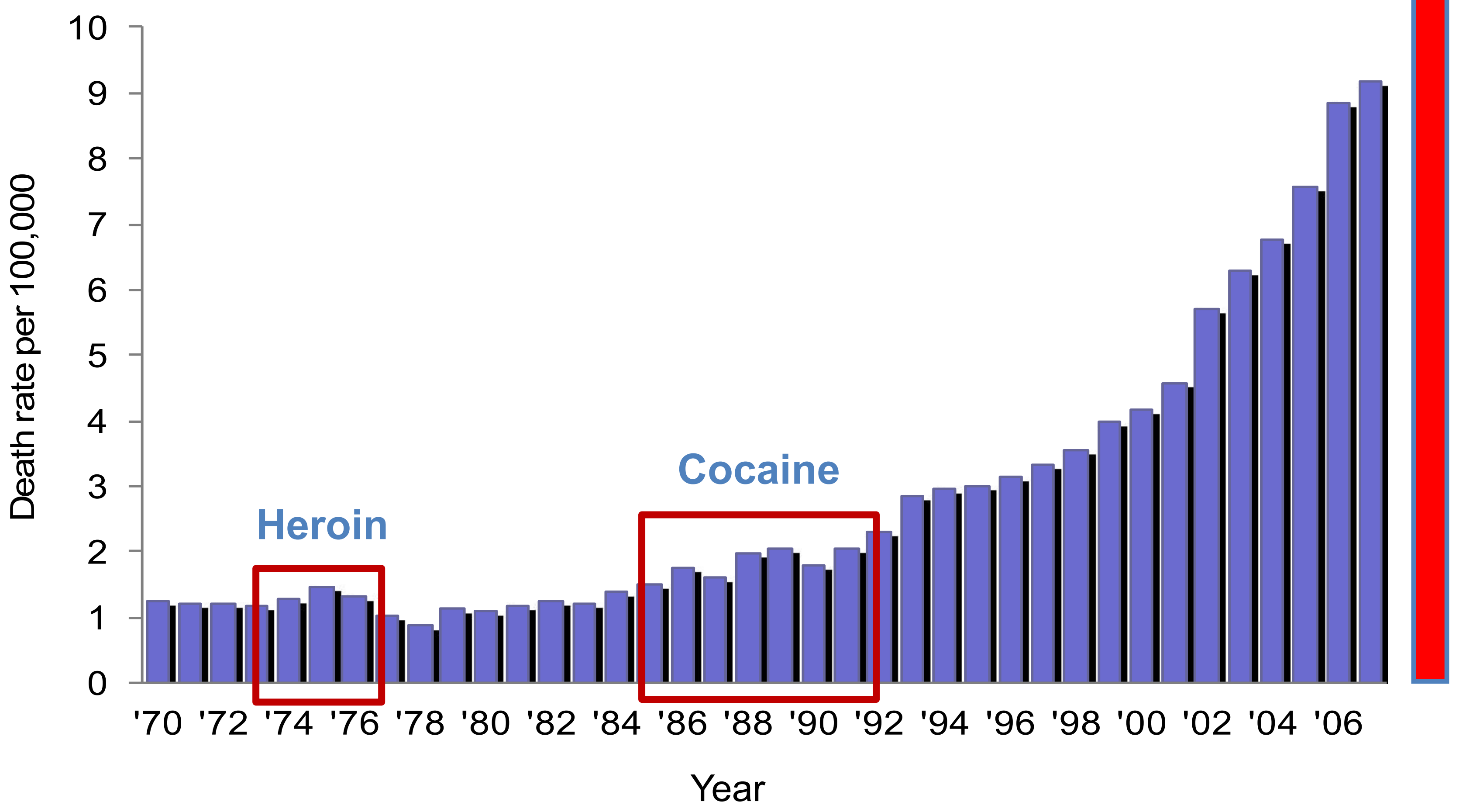
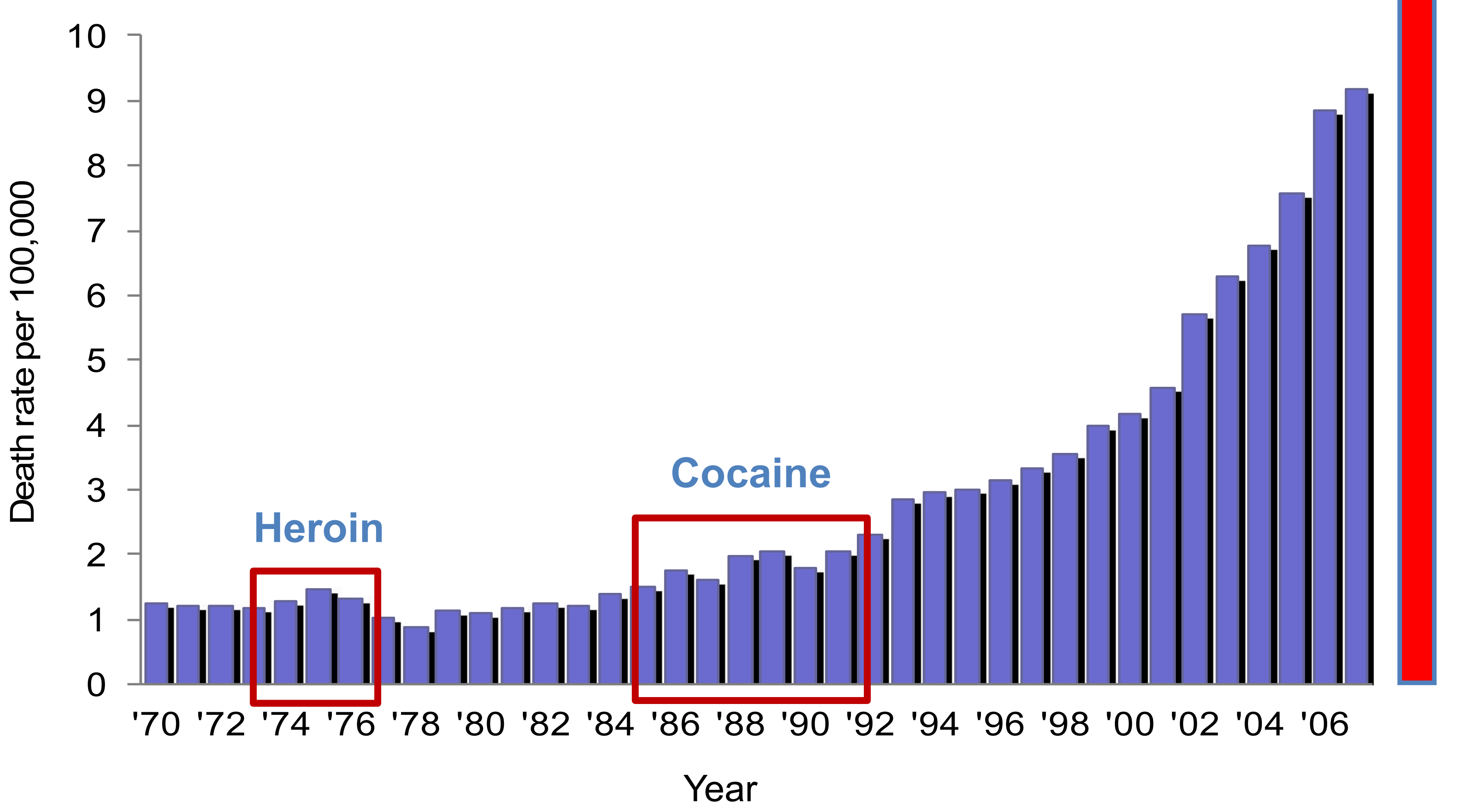
Unintentional Drug Overdose Deaths United States



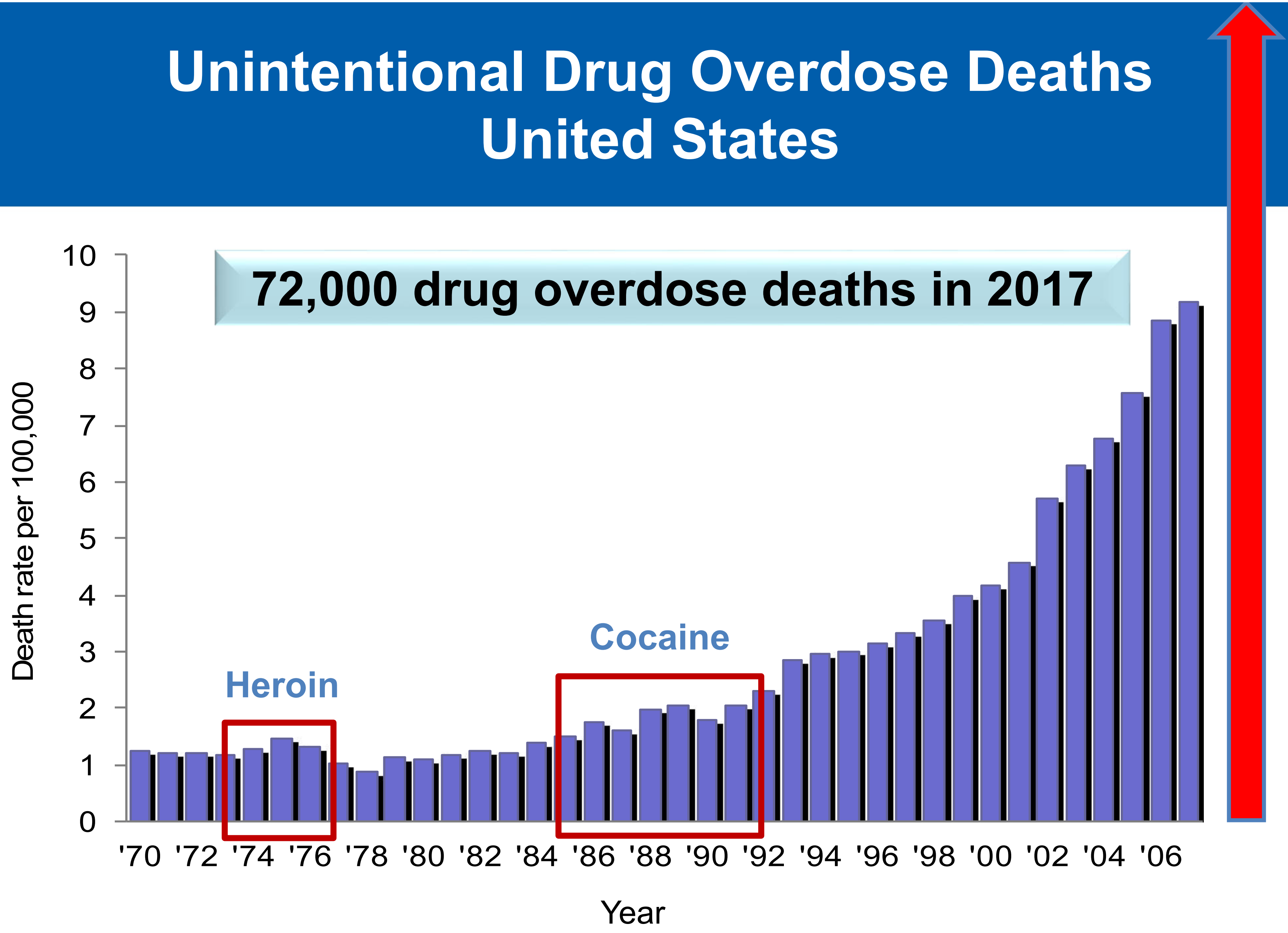
National Vital Statistics System, http://wonder.cdc.gov

Unintentional Drug Overdose Deaths
United States



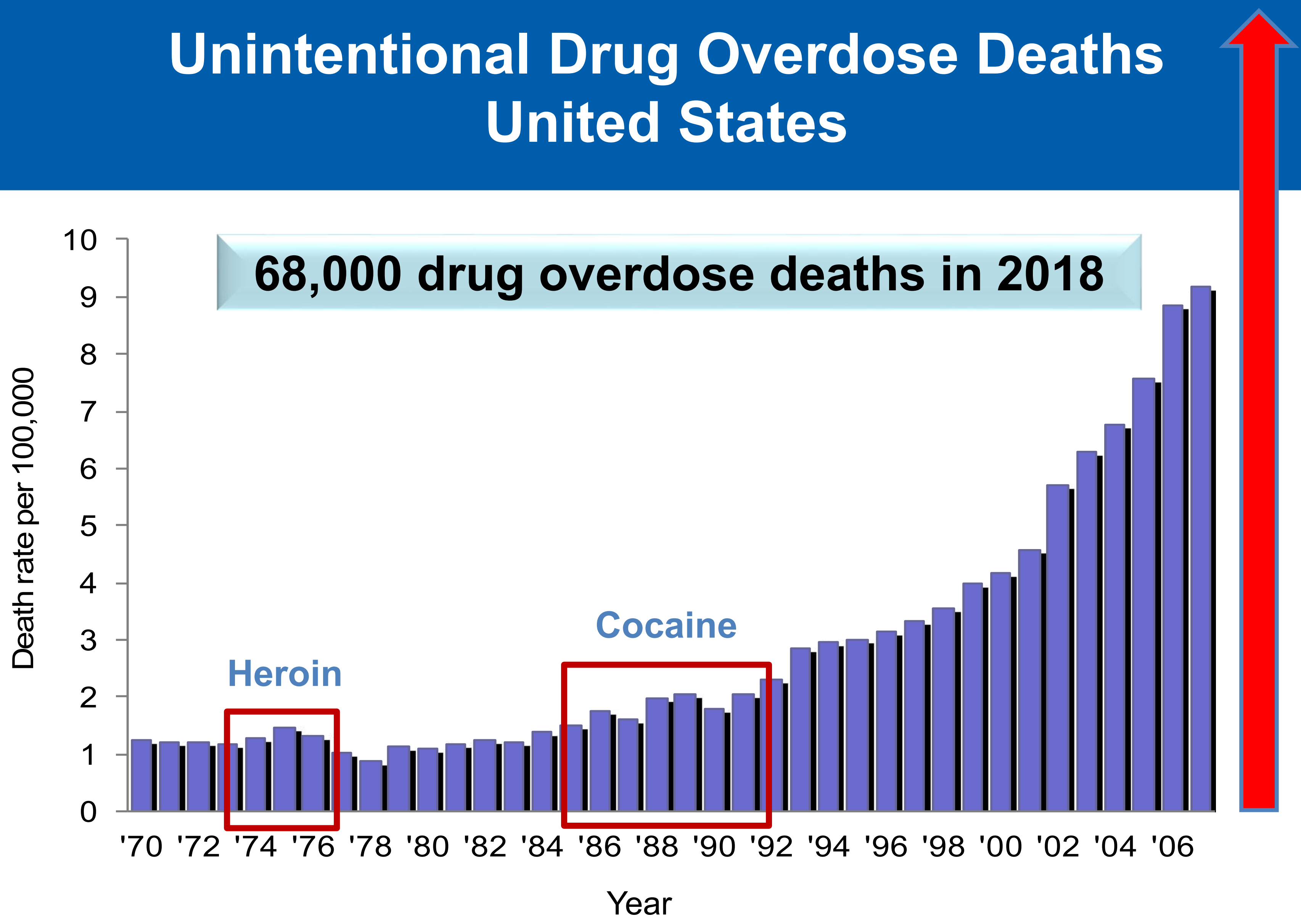
National Vital Statistics System, http://wonder.cdc.gov

Unintentional Drug Overdose Deaths United States



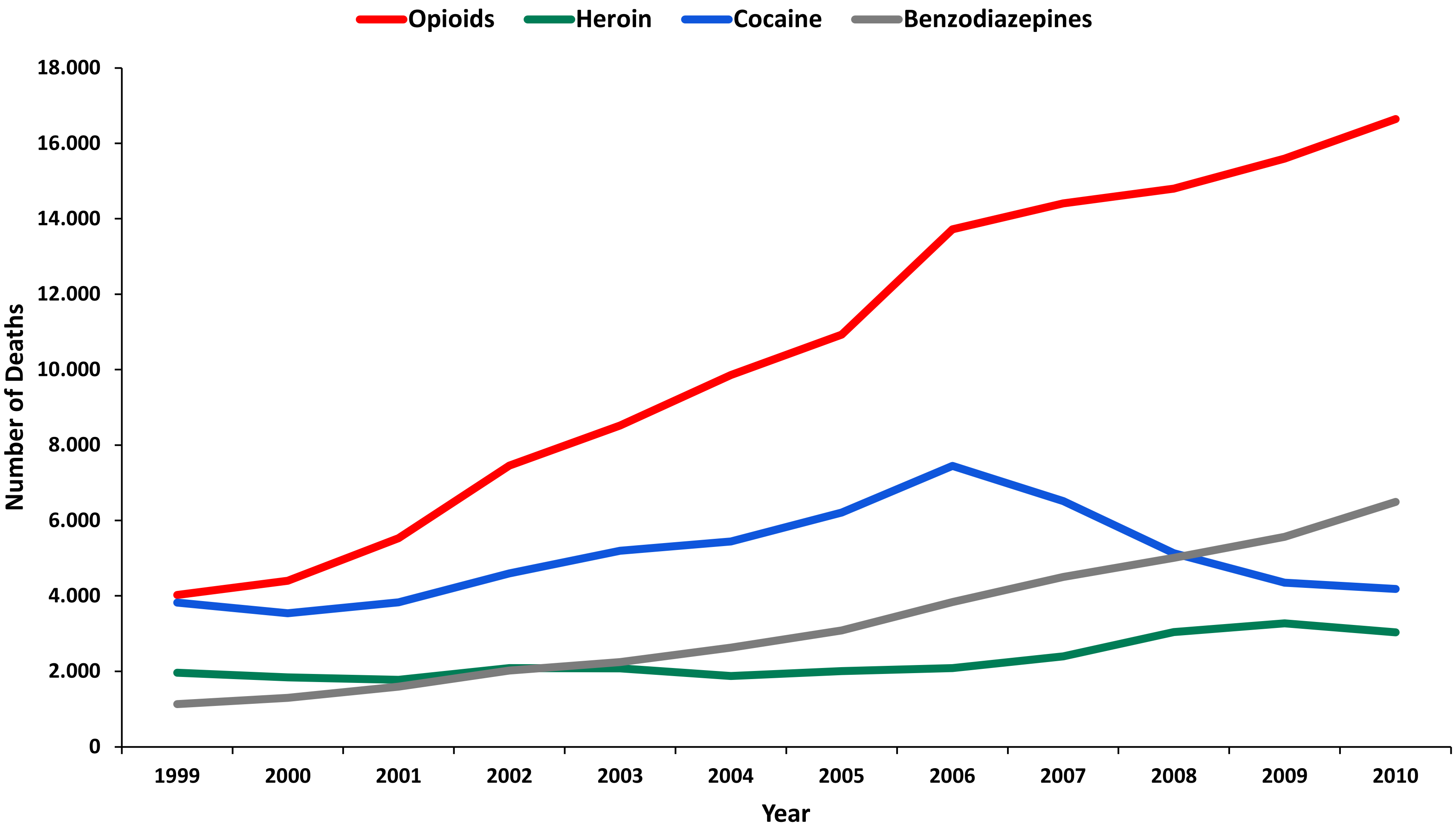
National Vital Statistics System, http://wonder.cdc.gov

Unintentional Drug Overdose Deaths
United States



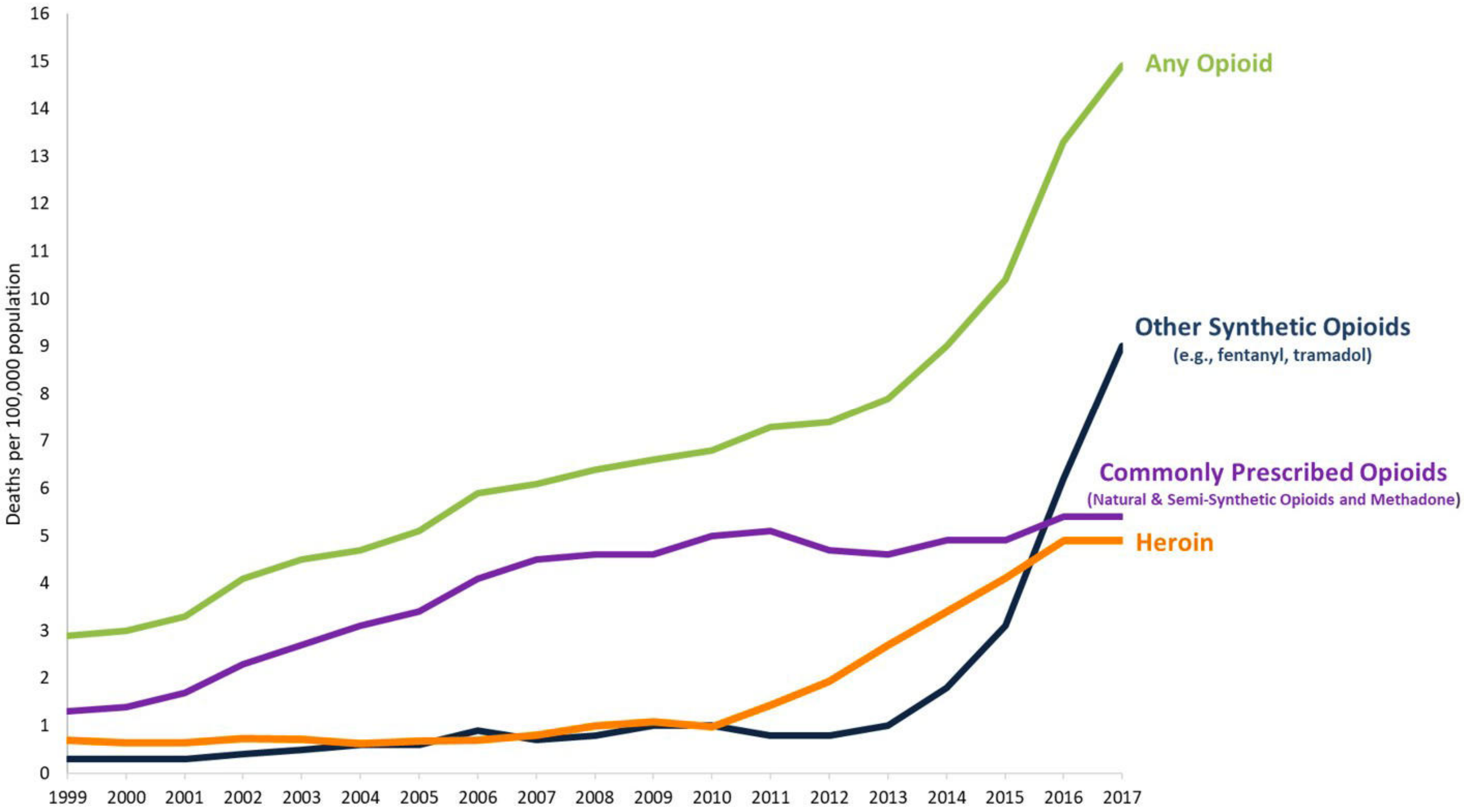
National Vital Statistics System, http://wonder.cdc.gov

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.

Overdose Death Rates Involving Opioids, by Type, United States, 2000-2017



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2018. https://wonder.cdc.gov/.

www.cdc.gov
Your Source for Credible Health Information

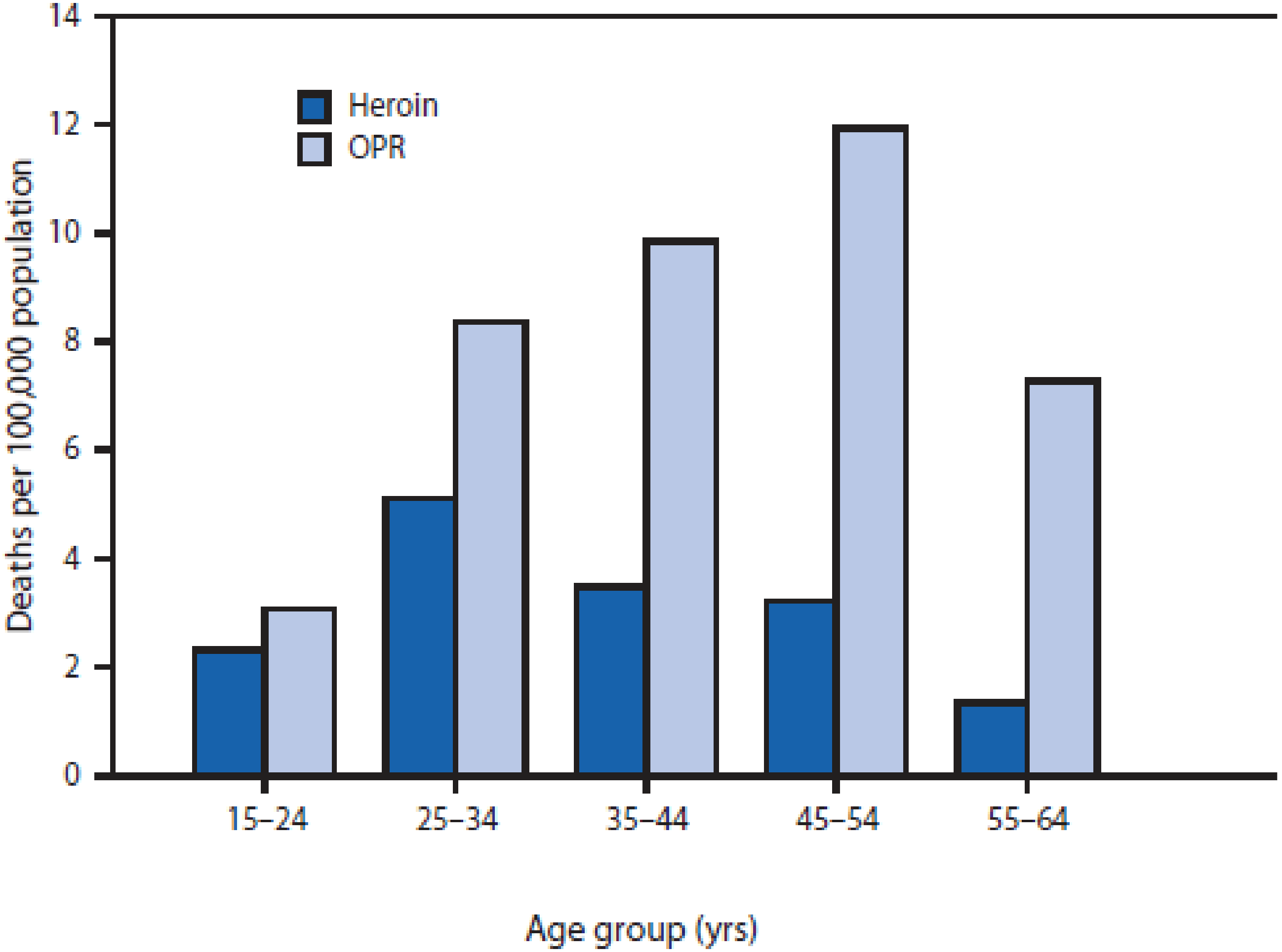
Three Opioid-Addicted Cohorts

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)

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

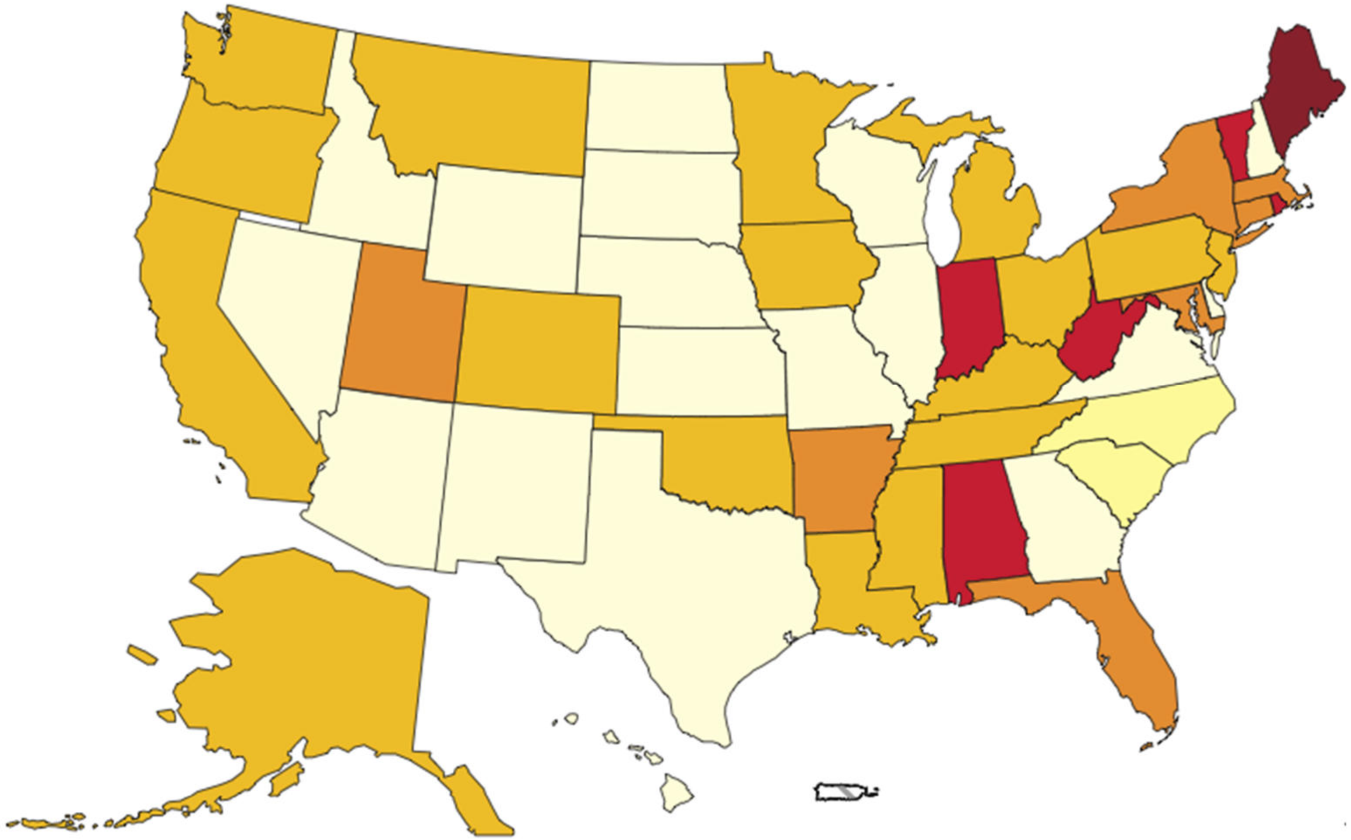
Dramatic Increases in Maternal Opioid Use and Neonatal Abstinence Syndrome

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

The First Count of Fentanyl Deaths in 2016: Up 540% in Three Years

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)



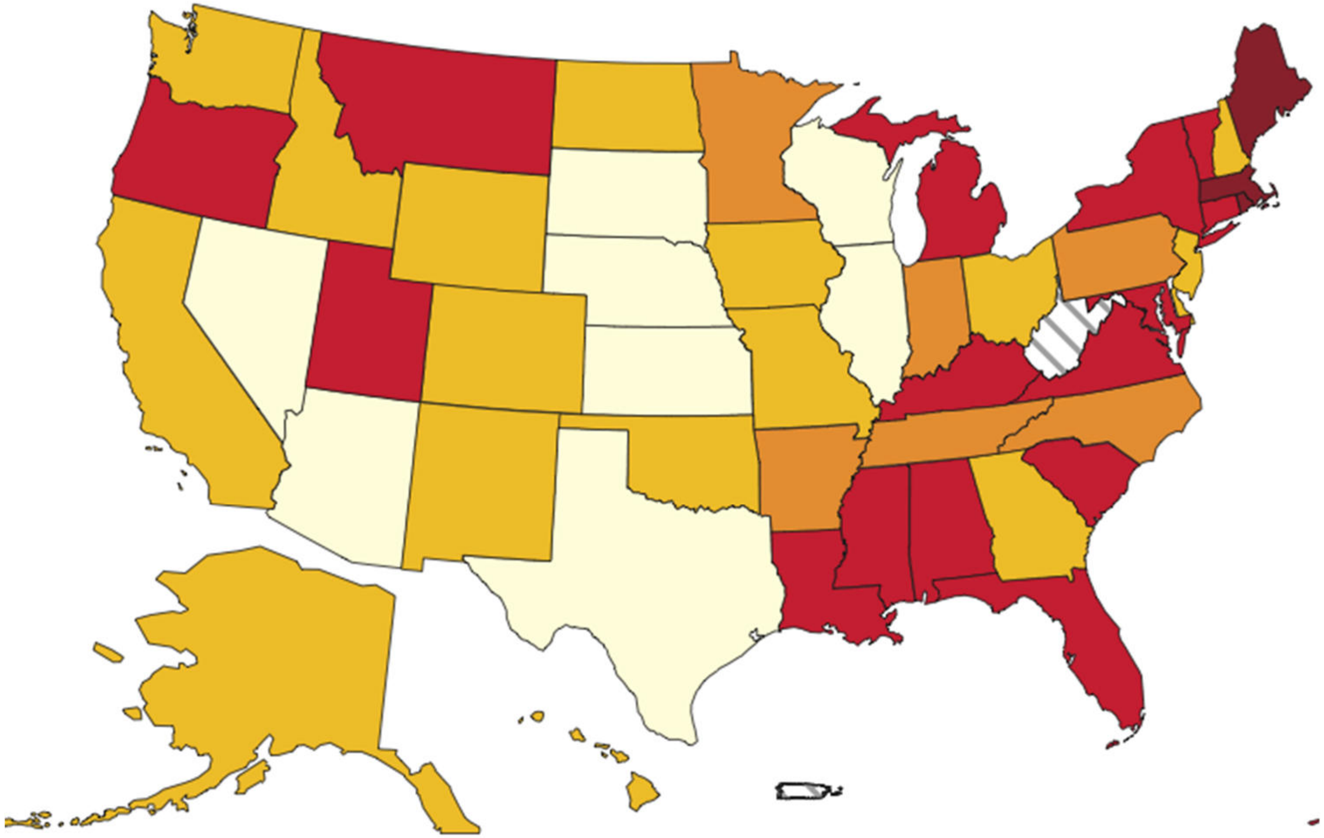
1999

(range 1 - 50)

< 8		15 - 18		45 or more	
8 - 14		19 - 44		Incomplete data	

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)



2001

(range 1 – 71)

< 8		15 - 18		45 or more	
8 - 14		19 - 44		Incomplete data	

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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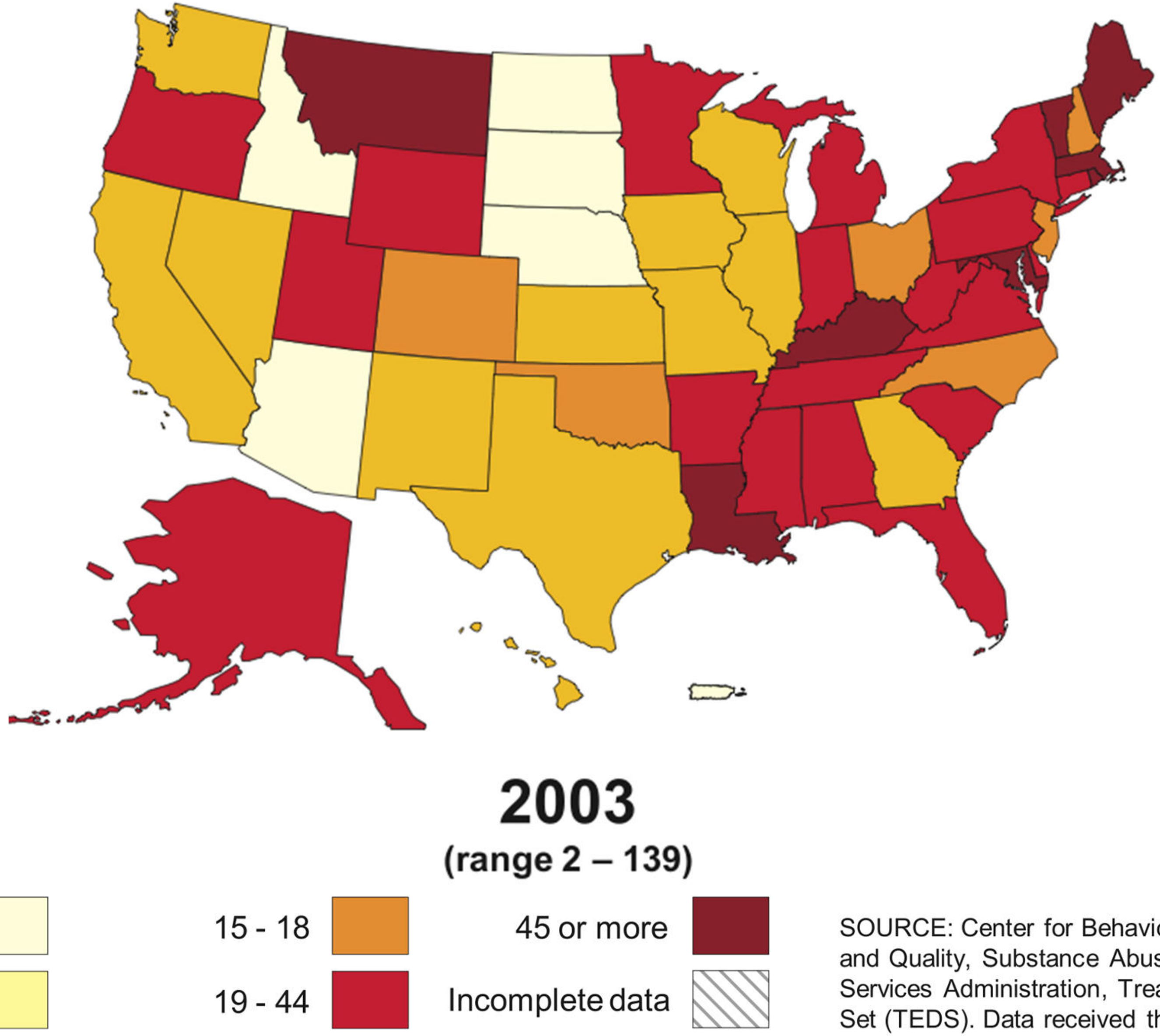

SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

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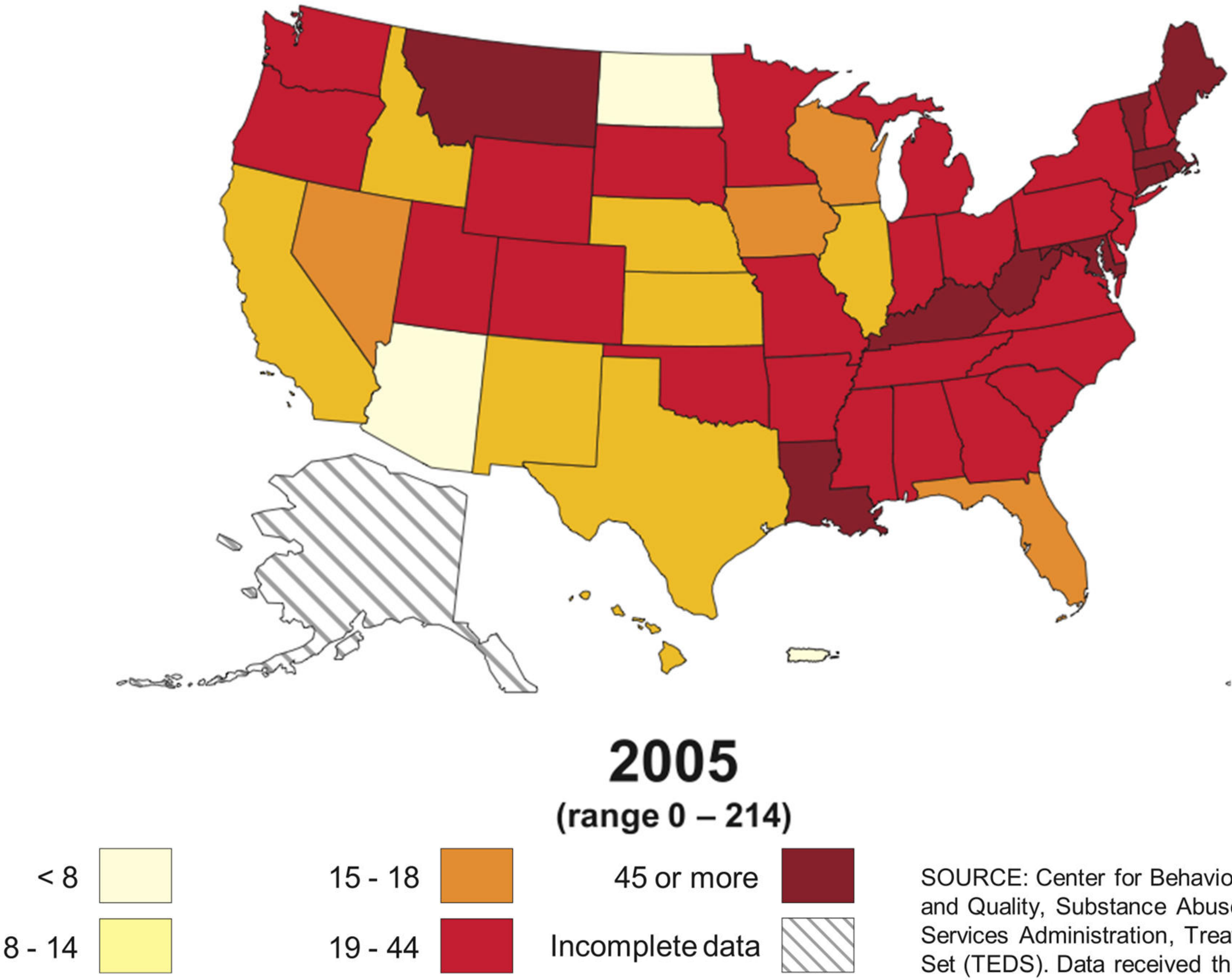

SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

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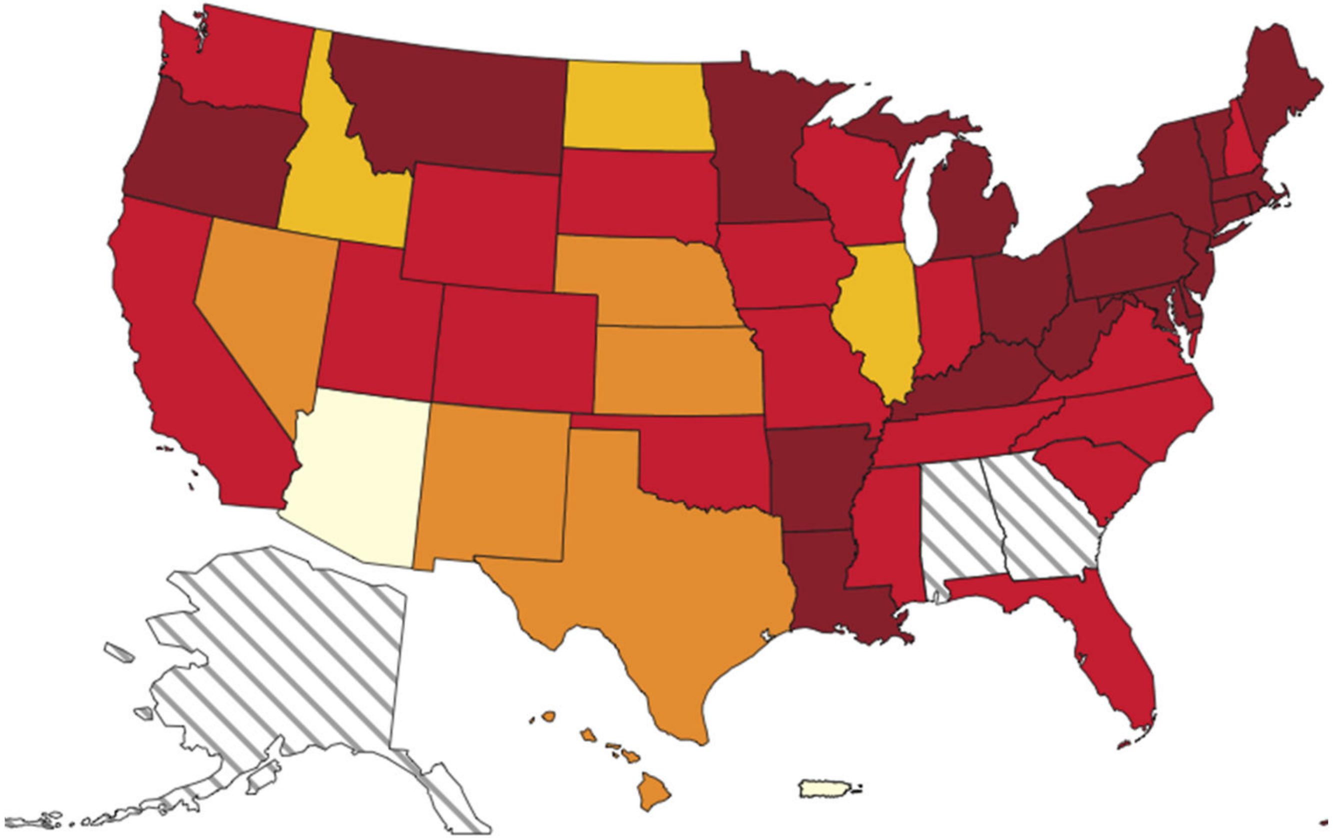


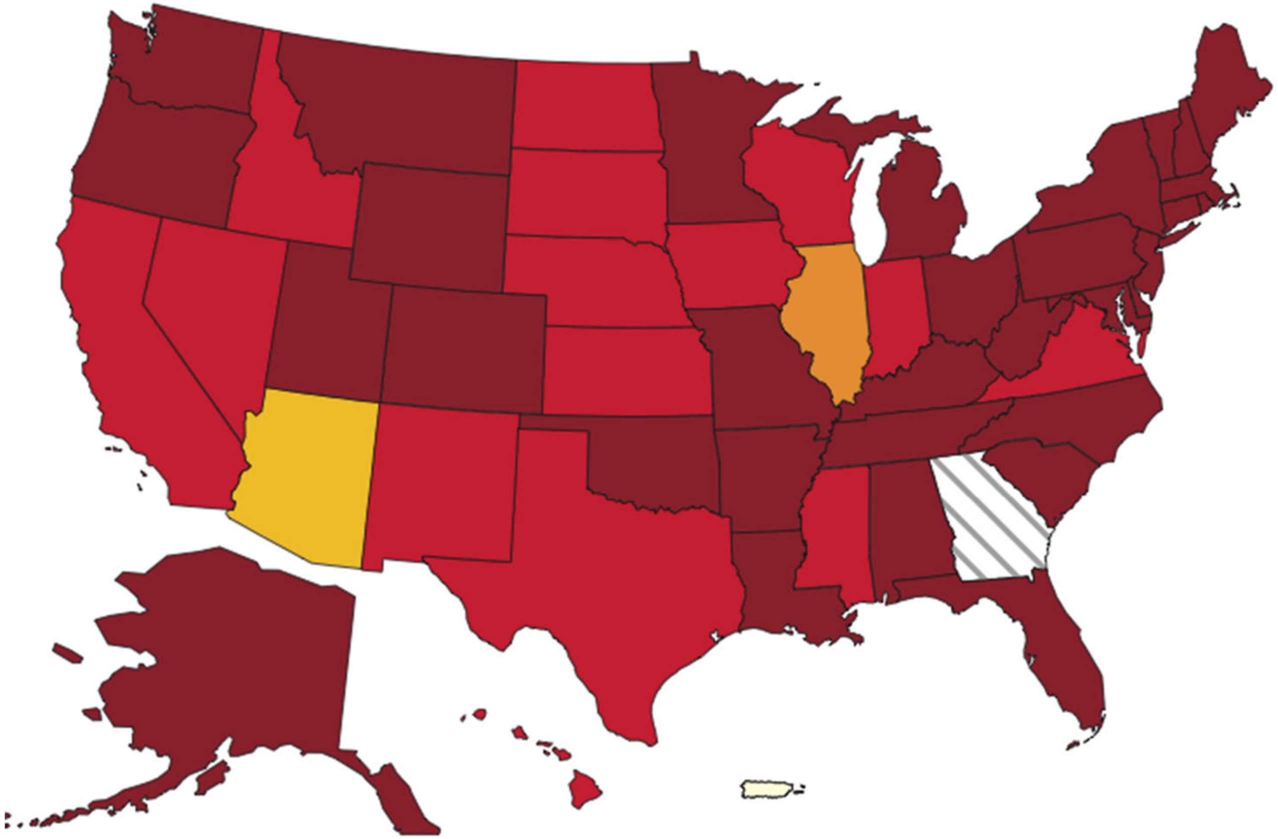
2007

(range 1 – 340)

< 8		15 - 18		45 or more	
8 - 14		19 - 44		Incomplete data	

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)



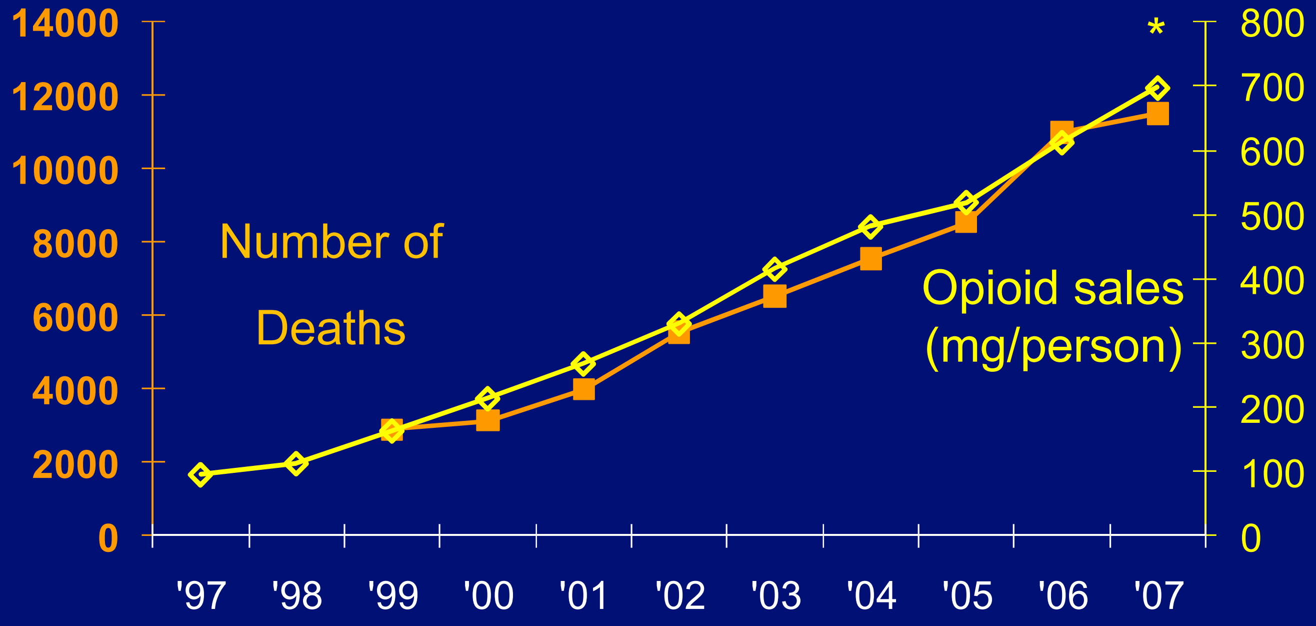
2009

(range 1 – 379)

< 8		15 - 18		45 or more	
8 - 14		19 - 44		Incomplete data	

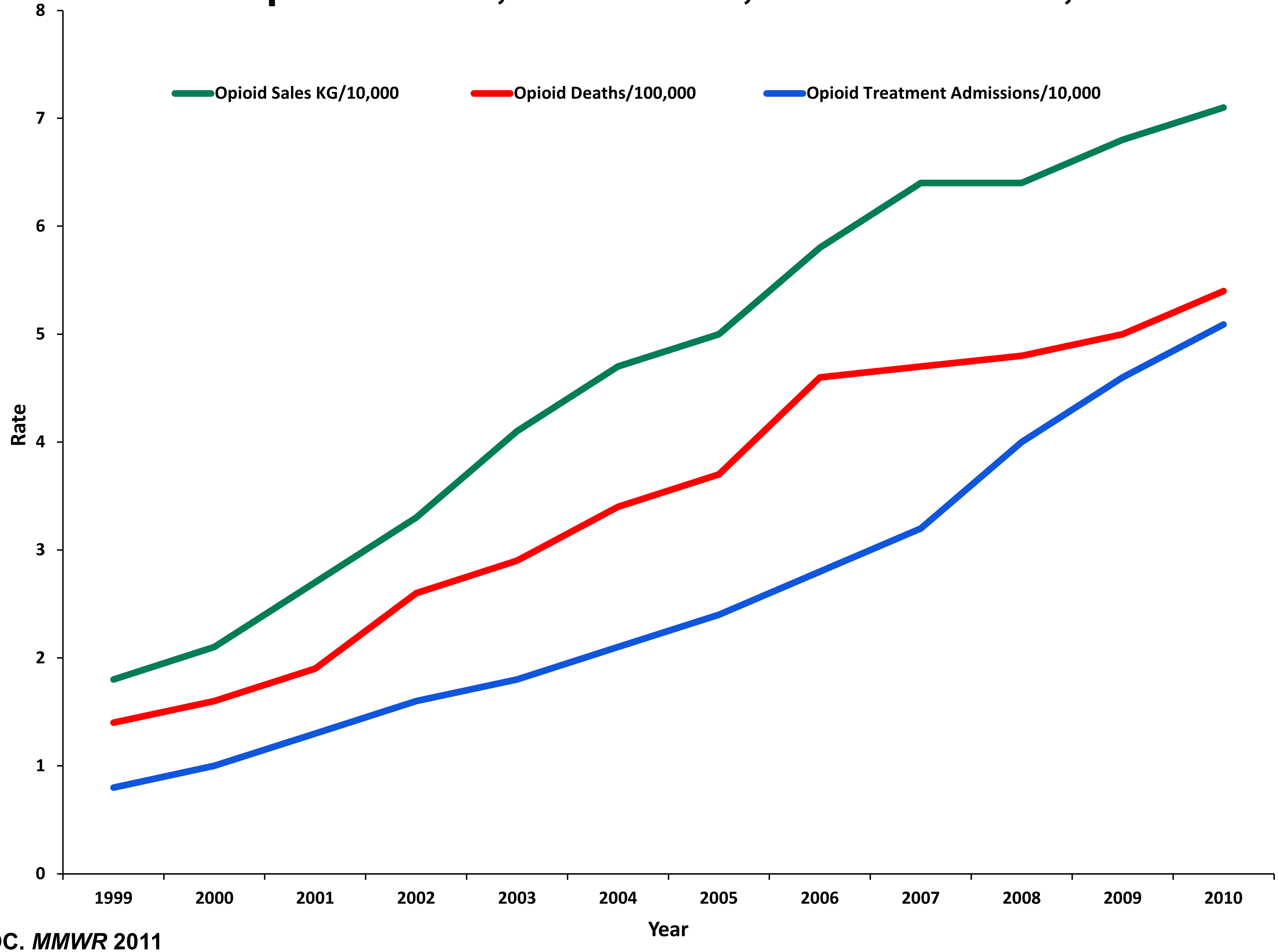
SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 11.03.10.

Unintentional overdose deaths involving opioid analgesics parallel per capita sales of opioid analgesics in morphine equivalents by year, U.S., 1997-2007



Source: National Vital Statistics System, multiple cause of death dataset, and DEA ARCOS
* 2007 opioid sales figure is preliminary.

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



CDC. *MMWR* 2011

Pro-painkiller lobby shapes policy amid drug epidemic

Matthew Perrone and Ben Wieder, Associated Press and Center for Public Integrity

Over the past decade, drug companies and opioid-friendly groups spent more than

$880 million

on lobbying and political contributions. That's more than:

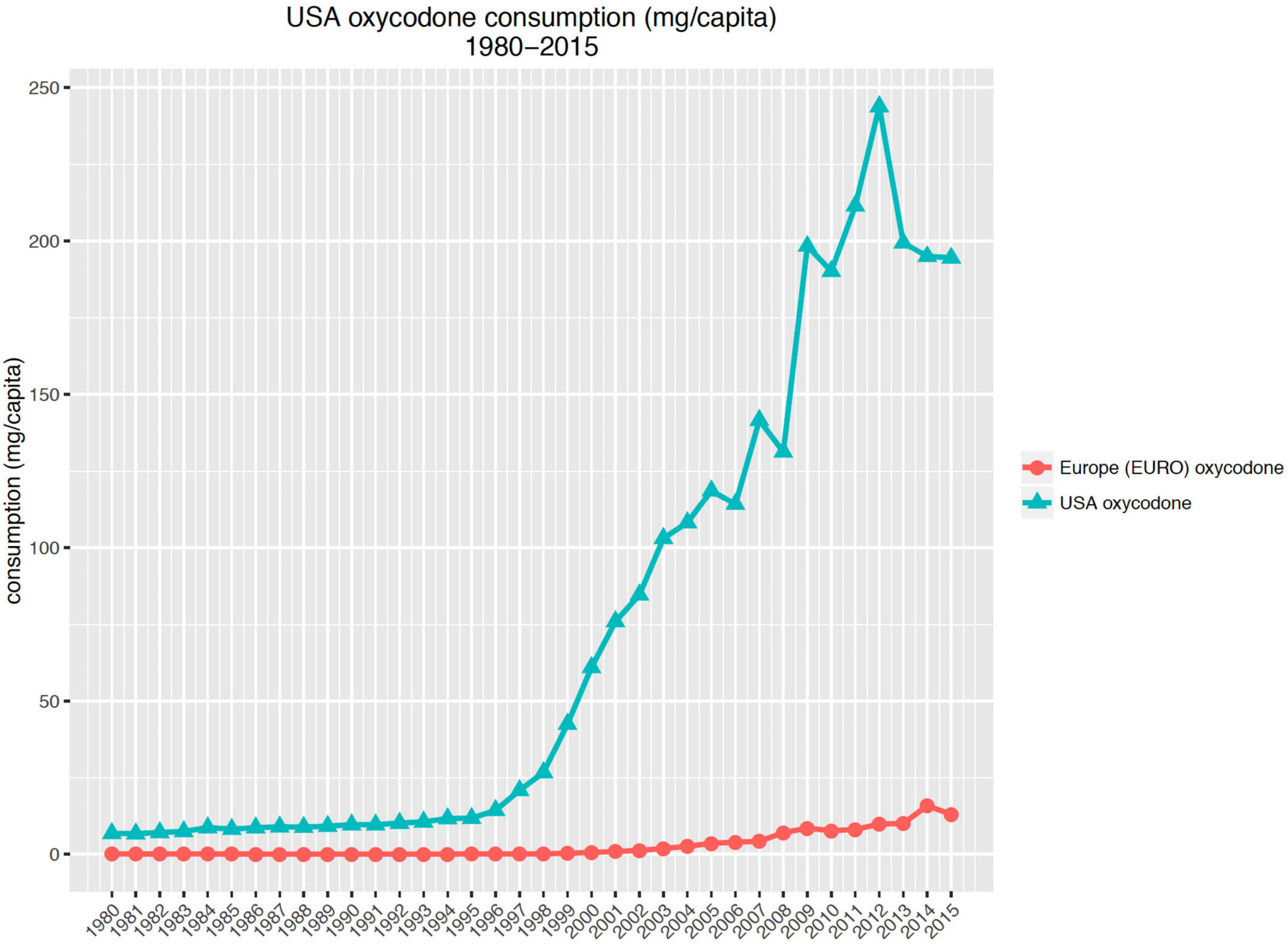
8 times
the gun lobby's spending

200 times
the spending of groups advocating stricter opioid prescription rules

POLITICAL SPENDING

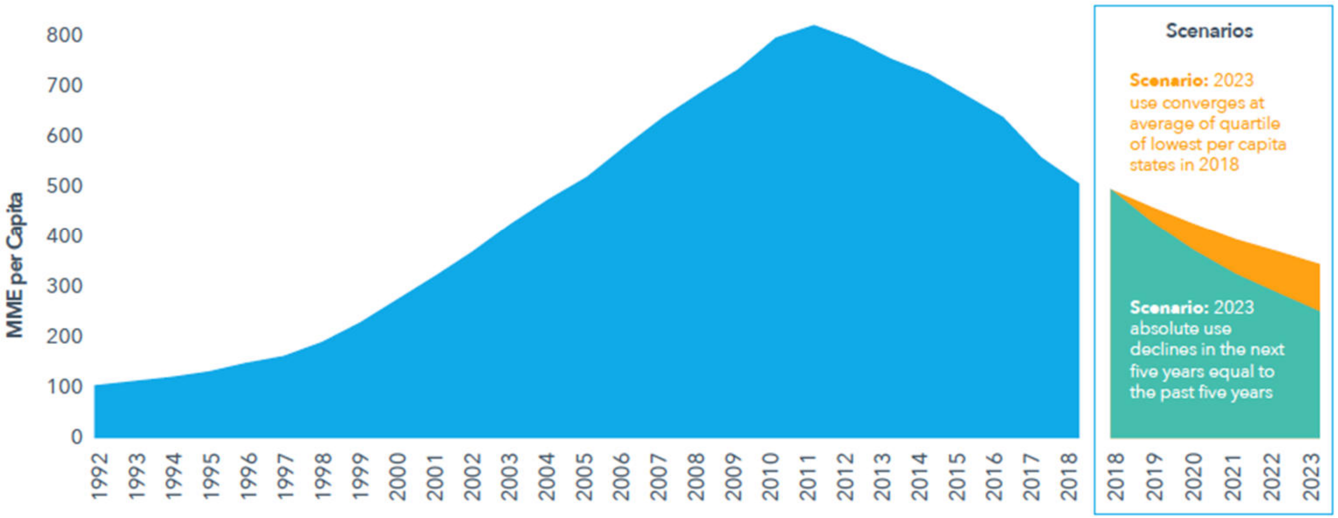
Opioid manufacturers and their allies have contributed roughly $80 million to state and federal candidates and have spent about $746 million on state and federal lobbying since 2006. How the spending breaks down:

to State	to Federal	for State/Federal candidates	
$109 mil.	$716 mil.	45% Dems	54% Reps



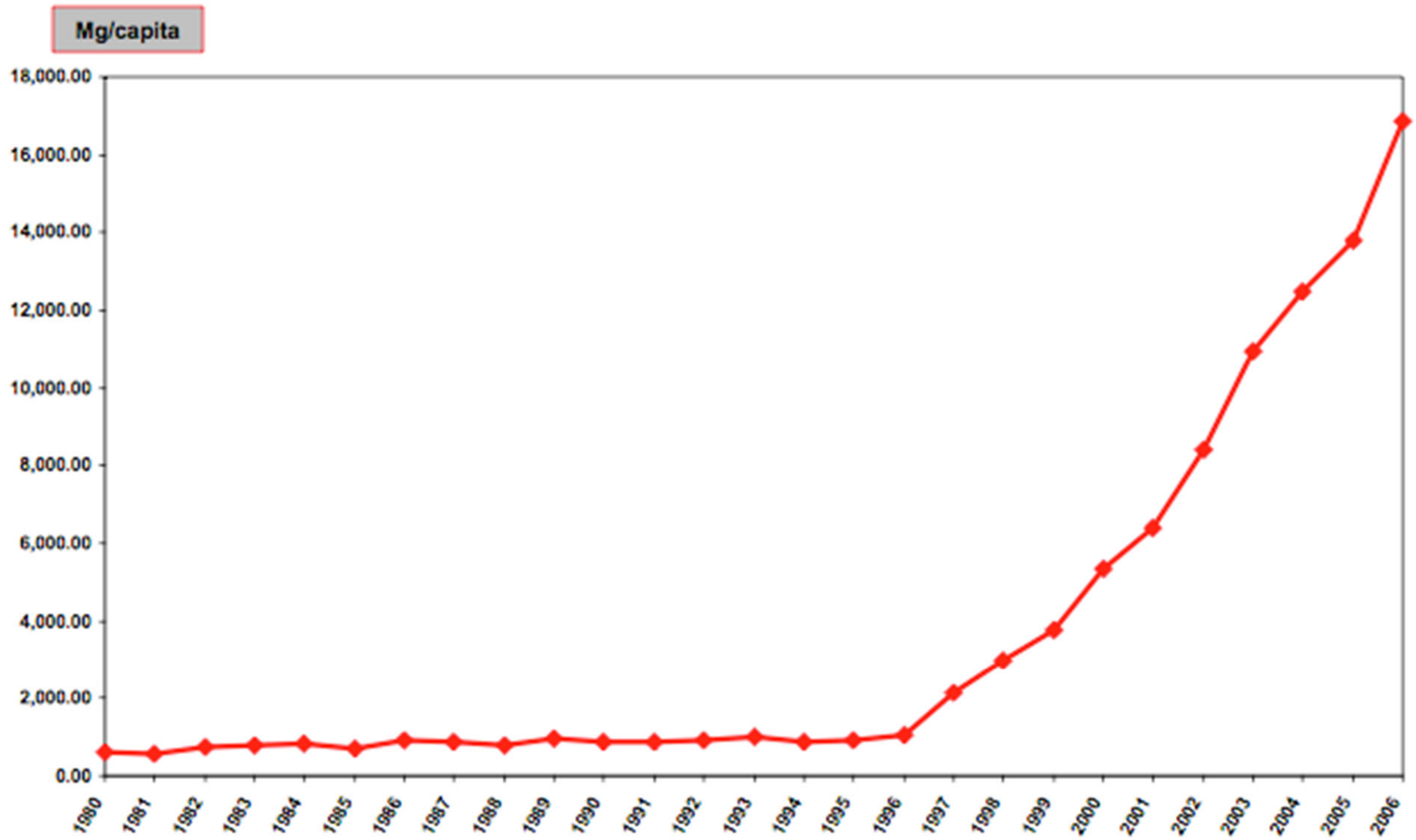
Sources: International Narcotics Control Board; World Health Organization population data

Exhibit 28: Scenarios for Prescription Opioid Volumes in the United States per Capita in Morphine Milligram Equivalents (MME)



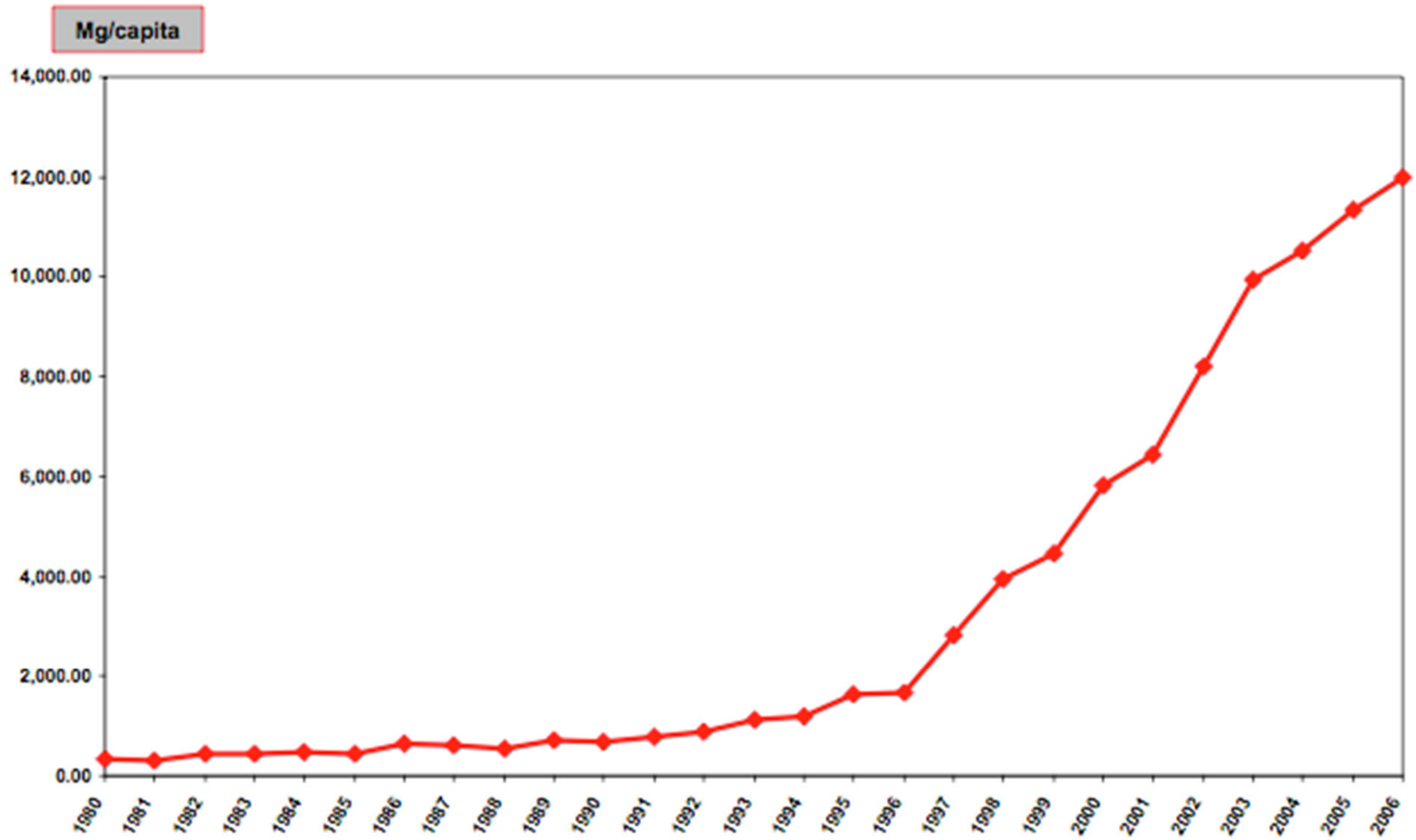
Source: IQVIA "SMART – Launch Edition", Sep 2018; IQVIA Institute, Dec 2018
Notes: States with MME per capita below the average of the lowest quartile do not change in the convergence scenario.

New York Consumption of Oxycodone 1980 - 2006



Sources: U.S. Dept of Justice, Drug Enforcement Administration, Office of Diversion Control

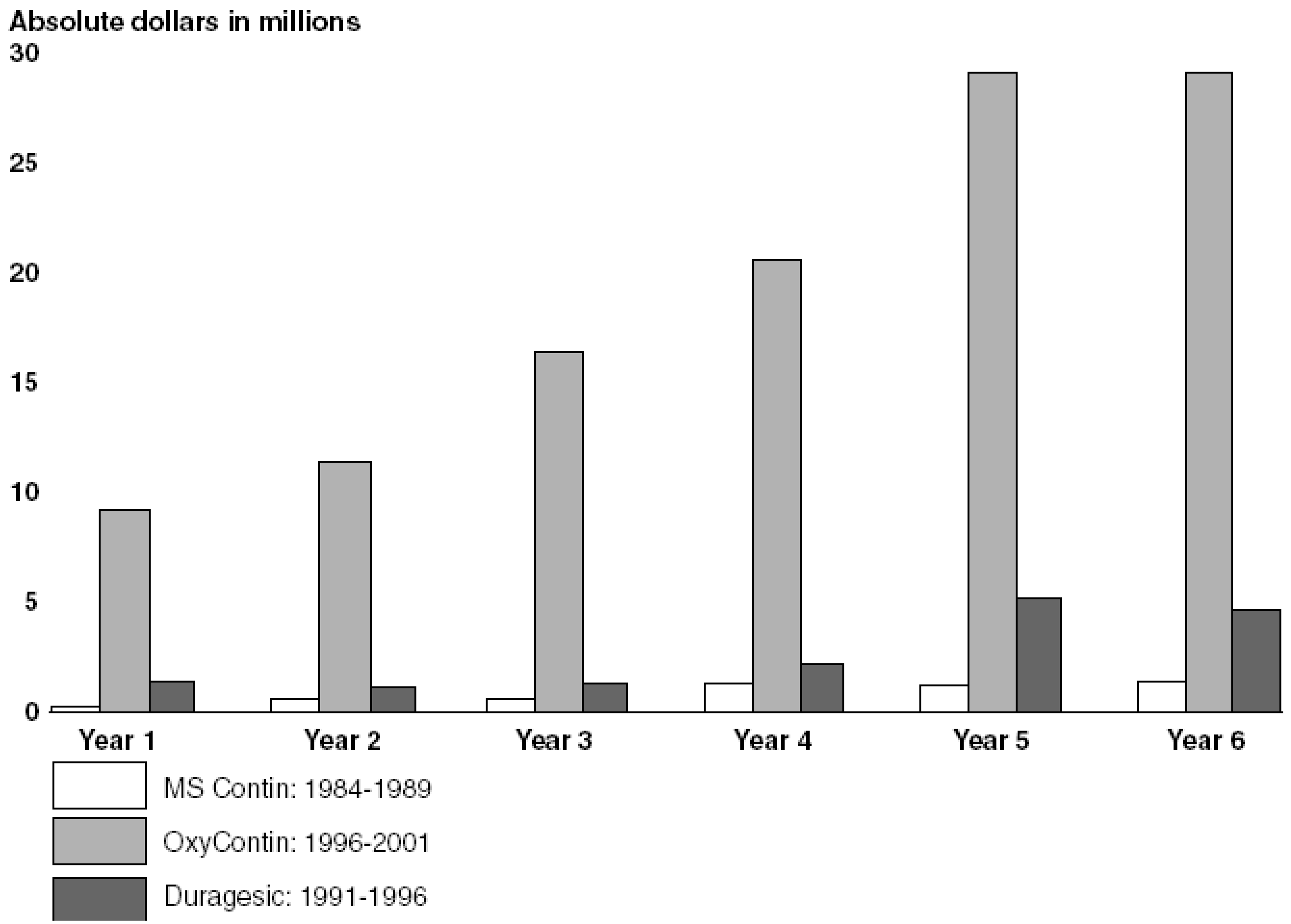
New York Consumption of Hydrocodone 1980 - 2006



Sources: U.S. Dept of Justice, Drug Enforcement Administration, Office of Diversion Control

Dollars Spent Marketing OxyContin (1996-2001)

Figure 1: Promotional Spending for Three Opioid Analgesics in First 6 Years of Sales



Source: United States General Accounting Office: Dec. 2003, “OxyContin Abuse and Diversion and Efforts to Address the Problem.”

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

University of California San Francisco (UCSF) Medical Center
Ambulatory Services

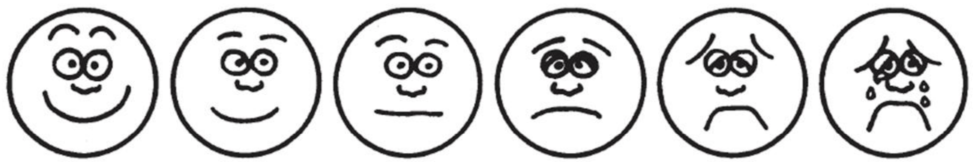
Have you experienced any pain within the past week? No ❑ Yes ❑
(If "No," stop here and give this to your provider. If "Yes," please answer the rest of the questions)

Where is your pain? ____

Circle a number from 0-10 that best describes how much pain you are having <u>now?</u>

0 1 2 3 4 5 6 7 8 9 10
No Pain Worst Pain Possible

For a child or non-English speaking adult, use Wong-Baker FACES Pain Rating Scale©. *
Ask the patient to circle the face that best describes how he/she feels:



1	2	3	4	5	6
No Hurt	Hurts Little Bit	Hurts Little More	Hurts Even More	Hurts Whole Lot	Hurts Worst

* ©Wong, D.L. (1999) *Whaley and Wong's Nursing Care of Infants and Children, 6th ed.* St. Louis, MO: Mosby. Used with permission.

What does your pain feel like? **Circle response:**

sharp	numb	miserable
dull	stabbing	unbearable
burning	gnawing	continuous
aching	shooting	occasional
throbbing	exhausting	
tender	penetrating	

What makes the pain better? ____

What makes the pain worse? ____

Are you currently taking medication(s) or using some type of treatment for pain relief? No ❑ Yes ❑

If yes, list medication and/or treatment: ____

Provider Use Only

TREATMENT PLAN / RESPONSE: ____

____

____

Signature ______________________________ Date ______________

“The risk of addiction is much less than 1%”

Porter J, Jick H. *Addiction rare in patients treated with narcotics*. N Engl J Med. 1980 Jan 10;302(2):123

Cited 824 times (Google Scholar)

ADDICTION RARE IN PATIENTS TREATED WITH NARCOTICS

To the Editor: Recently, we examined our current files to determine the incidence of narcotic addiction in 39,946 hospitalized medical patients[1] who were monitored consecutively. Although there were 11,882 patients who received at least one narcotic preparation, there were only four cases of reasonably well documented addiction in patients who had no history of addiction. The addiction was considered major in only one instance. The drugs implicated were meperidine in two patients,[2] Percodan in one, and hydromorphone in one. We conclude that despite widespread use of narcotic drugs in hospitals, the development of addiction is rare in medical patients with no history of addiction.

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1. Jick H, Miettinen OS, Shapiro S, Lewis GP, Siskind Y, Slone D. Comprehensive drug surveillance. JAMA. 1970; 213:1455-60.
2. Miller RR, Jick H. Clinical effects of meperidine in hospitalized medical patients. J Clin Pharmacol. 1978; 18:180-8.

Annals of Internal Medicine

The Effectiveness and Risks of Long-Term Opioid Therapy for Chronic Pain: A Systematic Review for a National Institutes of Health Pathways to Prevention Workshop

Roger Chou, MD; Judith A. Turner, PhD; Emily B. Devine, PharmD, PhD, MBA; Ryan N. Hansen, PharmD, PhD; Sean D. Sullivan, PhD; Ian Blazina, MPH; Tracy Dana, MLS; Christina Bougatsos, MPH; and Richard A. Deyo, MD, MPH

Background: Increases in prescriptions of opioid medications for chronic pain have been accompanied by increases in opioid overdoses, abuse, and other harms and uncertainty about long-term effectiveness.

Purpose: To evaluate evidence on the effectiveness and harms of long-term (>3 months) opioid therapy for chronic pain in adults.

Data Sources: MEDLINE, the Cochrane Central Register of Controlled Trials, the Cochrane Database of Systematic Reviews, PsycINFO, and CINAHL (January 2008 through August 2014); relevant studies from a prior review; reference lists; and ClinicalTrials.gov.

Study Selection: Randomized trials and observational studies that involved adults with chronic pain who were prescribed long-term opioid therapy and that evaluated opioid therapy versus placebo, no opioid, or nonopioid therapy; different opioid dosing strategies; or risk mitigation strategies.

Data Extraction: Dual extraction and quality assessment.

Data Synthesis: No study of opioid therapy versus no opioid therapy evaluated long-term (>1 year) outcomes related to pain, function, quality of life, opioid abuse, or addiction. Good- and fair-quality observational studies suggest that opioid therapy for chronic pain is associated with increased risk for overdose, opioid abuse, fractures, myocardial infarction, and markers of sexual dysfunction, although there are few studies for each of these outcomes; for some harms, higher doses are associated with increased risk. Evidence on the effectiveness and harms of different opioid dosing and risk mitigation strategies is limited.

Limitations: Non–English-language articles were excluded, meta-analysis could not be done, and publication bias could not be assessed. No placebo-controlled trials met inclusion criteria, evidence was lacking for many comparisons and outcomes, and observational studies were limited in their ability to address potential confounding.

Conclusion: Evidence is insufficient to determine the effectiveness of long-term opioid therapy for improving chronic pain and function. Evidence supports a dose-dependent risk for serious harms.

Primary Funding Source: Agency for Healthcare Research and Quality.

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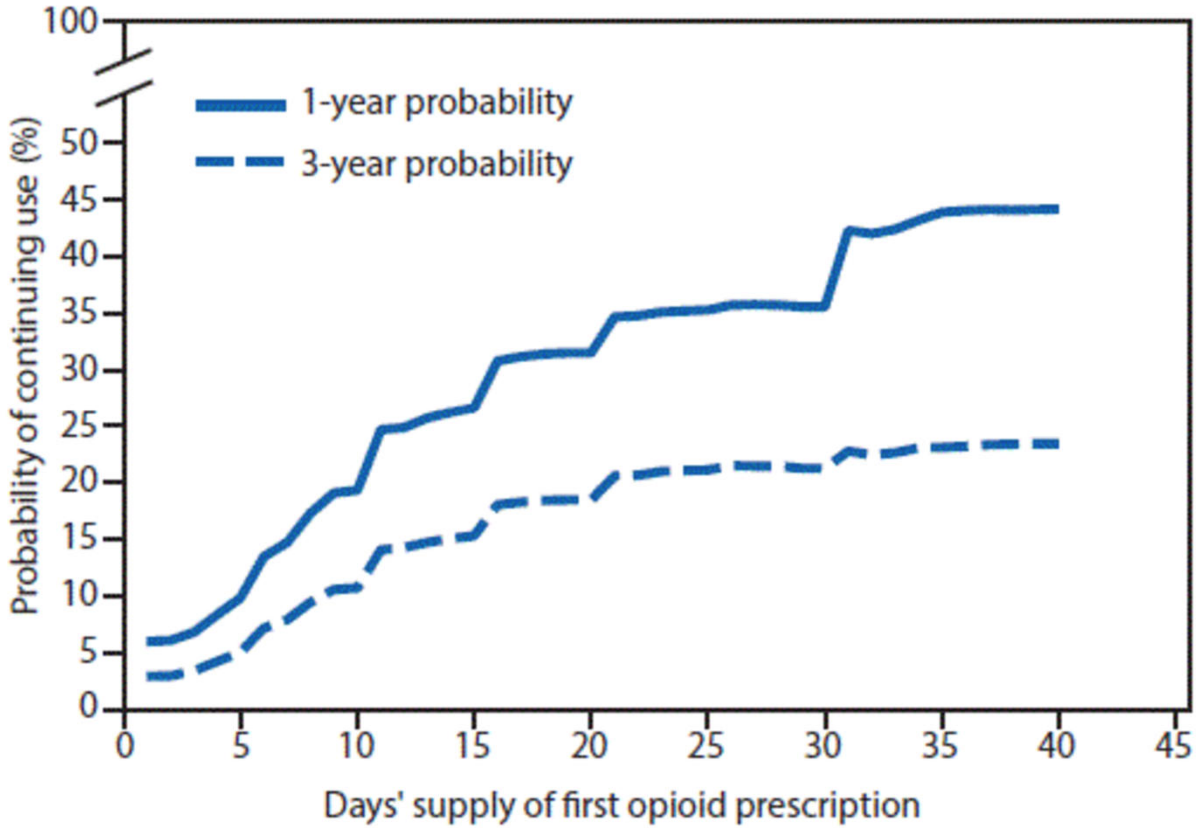
For author affiliations, see end of text.
This article was published online first at www.annals.org on 13 January 2015.

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



*** Days' supply of the first prescription is expressed in days (1–40) in 1-day increments.**

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.

One Month of Oral Morphine Decreases Gray Matter Volume in the Right Amygdala of Individuals with Low Back Pain: Confirmation of Previously Reported Magnetic Resonance Imaging Results

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Elizabeth Ann Stringer, PhD,†
Katharine S. Baker, BPsySc,‡
Zahra N. Sayyid, BS,† John Sun, BS,†
Kelsey A. Campbell, BS,* and
Jarred W. Younger, PhD*

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Correspondence to: Joanne C. Lin, PhD, Department of Psychology, University of Alabama at Birmingham, 233 Campbell Hall, 1300 University Boulevard, Birmingham, AL 35294, USA. Tel: 205-975-5941; Fax: 205-975-6110; E-mail: jclin@uab.edu.

Funding sources: Dr. Younger was supported with a career development award from the National Institute on Drug Abuse (K99DA023609).

Conflicts of interest: The authors declare no conflicts of interest.

Abstract

Objective. Prolonged exposure to opioids is known

placebo-controlled study. Participants were randomized to receive daily morphine (n = 11) or a matched placebo (n = 10) for 1 month. High-resolution anatomical images were acquired immediately before and after the treatment administration period. Morphological gray matter changes were investigated using tensor-based morphometry, and significant regions were subsequently tested for correlation with morphine dosage.

Results. Decreased gray matter volume was observed in several reward- and pain-related regions in the morphine group, including the bilateral amygdala, left inferior orbitofrontal cortex, and bilateral pre-supplementary motor areas. Morphine administration was also associated with significant gray matter increases in cingulate regions, including the mid cingulate, dorsal anterior cingulate, and ventral posterior cingulate.

Conclusions. Many of the volumetric increases and decreases overlapped spatially with the previously reported changes. Individuals taking placebo for 1 month showed neither gray matter increases nor decreases. The results corroborate previous reports that rapid alterations occur in reward-related networks following short-term prescription opioid use.

Key Words. Opioids; Magnetic Resonance Imaging; Tensor-Based Morphometry

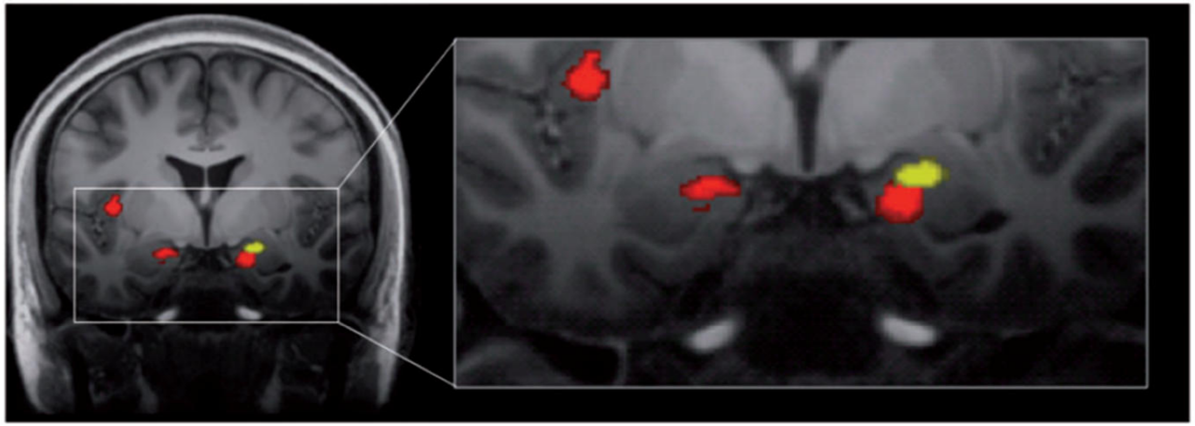


Figure 1 Coronal view (y = -6) of gray matter volume decreases following 1 month of daily morphine. Images of morphine-associated volumetric decreases from the current study (red) and the previous study (yellow) by Younger et al. [13] are overlaid on a 7 T structural image, depicting spatial locations of amygdalar changes. Images are thresholded at voxel-level false discovery rate of $P < 0.01$.

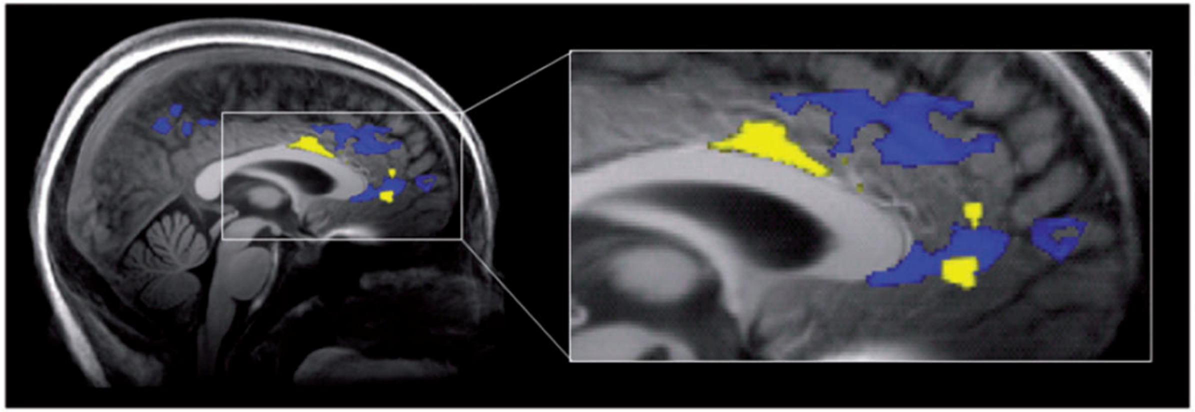


Figure 2 Sagittal view (x = 2) of gray matter volume increases following 1 month of daily morphine. Images of morphine-associated volumetric increases from the current study (blue) and the previous study (yellow) by Younger et al. [13] are overlaid on a 7 T structural image, depicting spatial locations of changes in the pregenual cingulate. Images are thresholded at voxel-level false discovery rate of $P < 0.01$.

Research

JAMA | Original Investigation

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

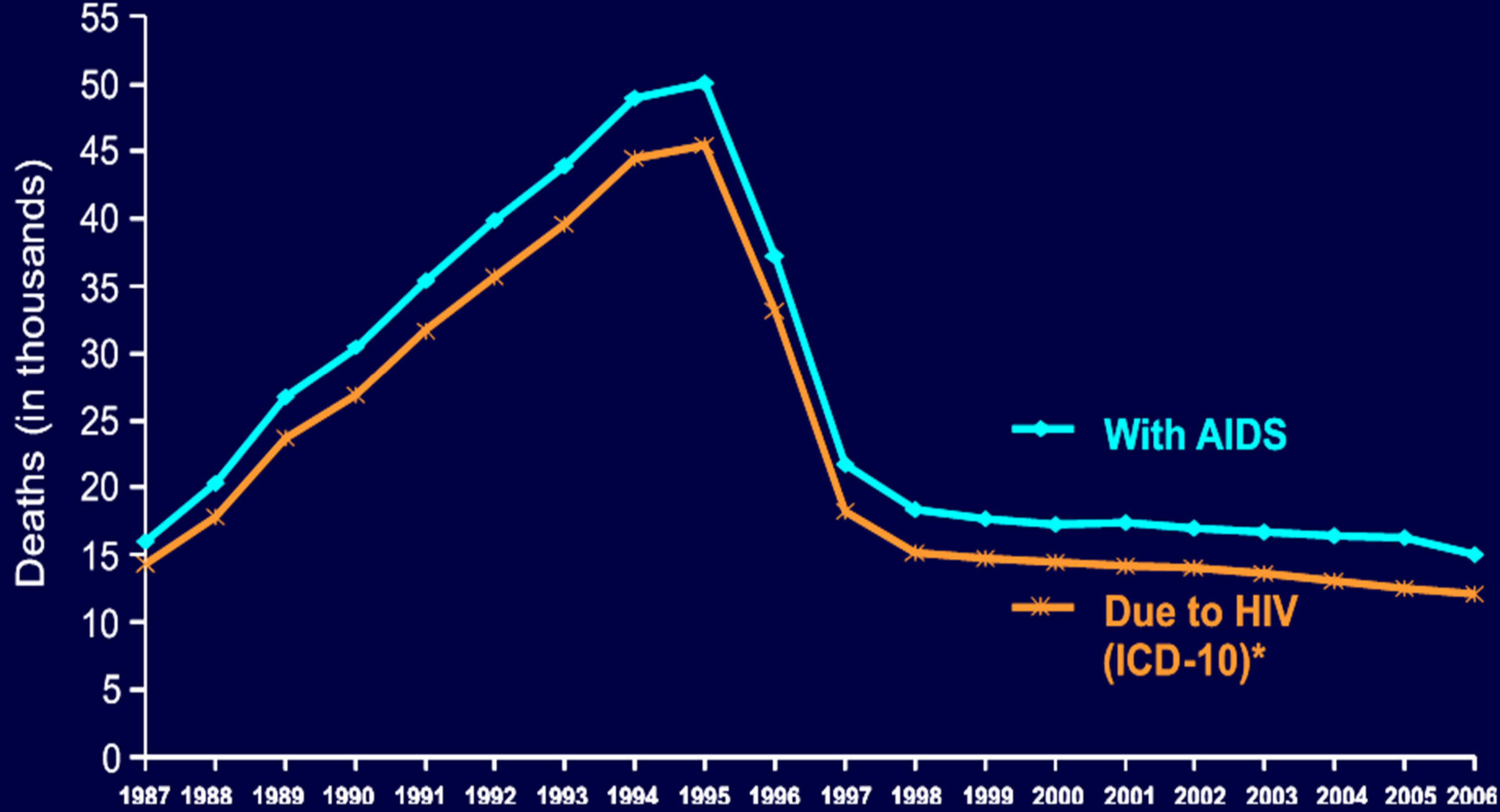
	NRS Pain Score, Mean (95% CI)[a]				
	Ibuprofen and Acetaminophen[b]	Oxycodone and Acetaminophen[c]	Hydrocodone and Acetaminophen[d]	Codeine and Acetaminophen[e]	*P* Value[f]
No. of patients[g]	101	104	103	103	
Primary end point: decline in score to 2 h	4.3 (3.6 to 4.9)	4.4 (3.7 to 5.0)	3.5 (2.9 to 4.2)	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

JAMA. 2017;318(17):1661-1667. doi:10.1001/jama.2017.16190

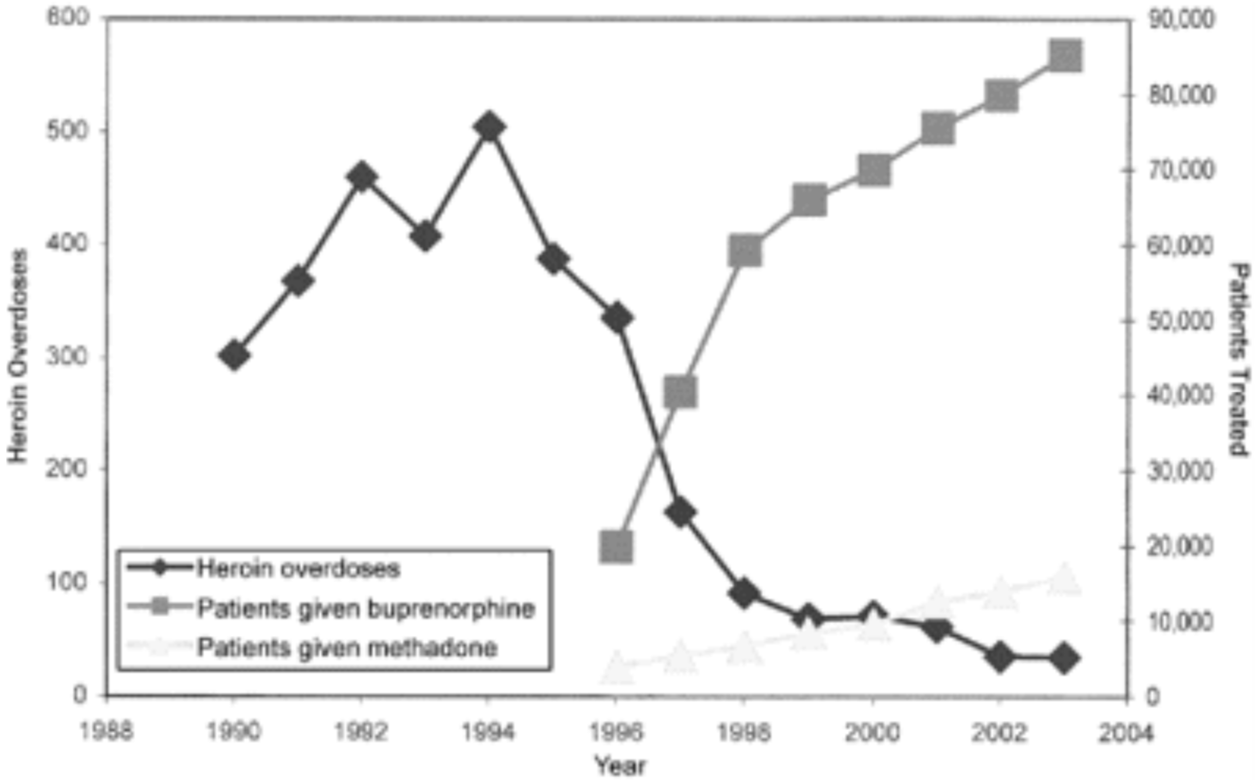
Controlling the epidemic:
A Three-pronged Approach

- **Prevent** new cases of opioid addiction.
- **Treat** people who are already addicted.
- **Reduce supply** from pill mills and the black-market.

Comparison of Mortality Data from AIDS Case Reports and Death Certificates in Which HIV Disease Was Selected as the Underlying Cause of Death, United States, 1987−2006



*For comparison with data for 1999 and later years, data in the bottom (red) line for 1987–1998 were modified to account for *ICD-10* rules instead of *ICD-9* rules.



From: Buprenorphine Use: The International Experience

Clin Infect Dis. 2006;43(Supplement_4):S197-S215. doi:10.1086/508184

Based on data available for analysis on: **9/1/2019**

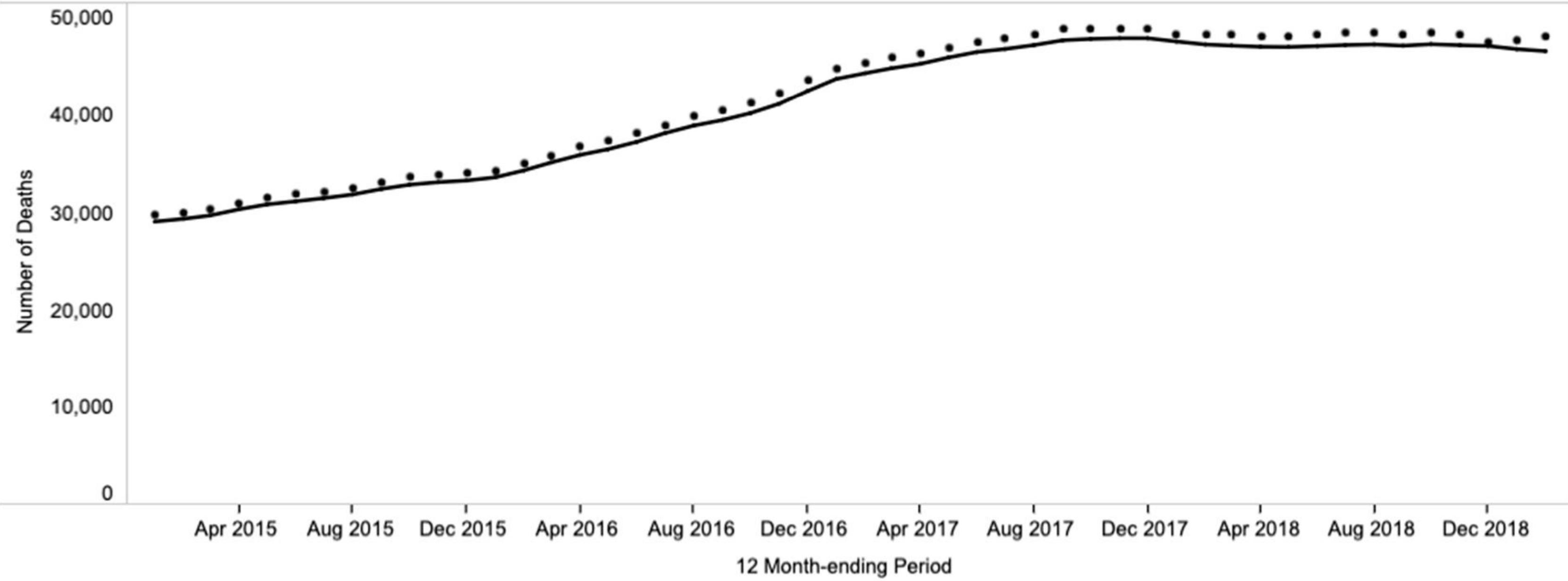
Select Jurisdiction

United States

Select specific drugs or drug classes

Opioids (T40.0-T40.4,T40.6)

Figure 2. 12 Month-ending Provisional Number of Drug Overdose Deaths by Drug or Drug Class: United States



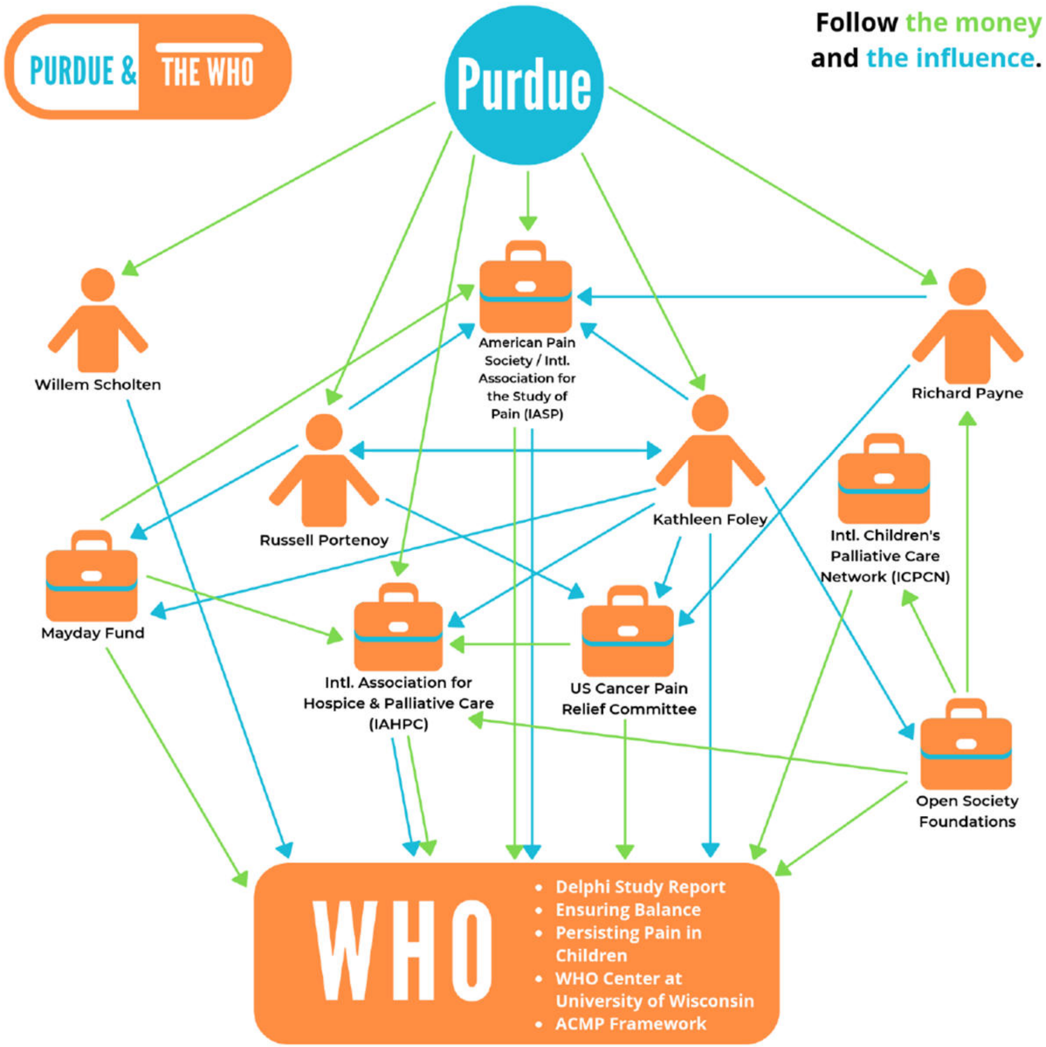
Legend for Drug or Drug Class

Opioids (T40.0-T40.4,T40.6)

---- Reported Value

O Predicted Value

FIGURE 2: INFLUENTIAL ORGANIZATIONS AND PEOPLE WITH TIES TO THE OPIOID INDUSTRY

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Summary

- The U.S. is in the midst of a severe epidemic of opioid addiction caused by a dramatic increase in opioid prescribing

- To bring the epidemic to an end:
  - We must prevent new cases of opioid addiction
  - We must ensure access to treatment for people already addicted