

# **Fourth Wave of Opioid (Illicit Drug) Epidemic: Cause and Effect Relationship**

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Editorial Peer Review: 25 journals

# OPIOID EPIDEMIC

The CDC declared overdoses from prescription painkillers an epidemic in 2011.

◆ Epidemic:

- Affecting or tending to affect a disproportionately large number of individuals within a population, community or region at the same time.

◆ Crisis:

- A time of intense difficulty, trouble, or danger.
- A time when a difficult or important decision must be made

◆ Endemic:

- A disease or condition regularly found among particular people or certain area.

# Opioid Epidemic

- **U.S. with 4.8% of World's Population**
  - Consumes 80% of world's opioid supply
  - Consumes 99% of world's hydrocodone supply
  - Consumes over 80% of the world's oxycodone supply
- **Escalating**
  - Abuse
  - Doctor shopping
  - Deaths
  - Illicit Drugs
  - Inability to monitor
  - High dose, multiple opioids
  - Combinations (holy trinity)



Energy & Commerce Committee  
October 8, 2004

# Opioid Epidemic

- **U.S. with 4.4% of World's Population**
  - Consumes over 70% of world's opioid supply
  - Consumes almost 100% of world's hydrocodone supply
  - Consumes over 70% of the world's oxycodone supply
- **Escalating**
  - Deaths
  - Heroin
  - Fentanyl
  - Declining prescriptions



February 6, 2018

# IS IT PRESCRIPTION OPIOID EPIDEMIC OR ILLICIT DRUG EPIDEMIC

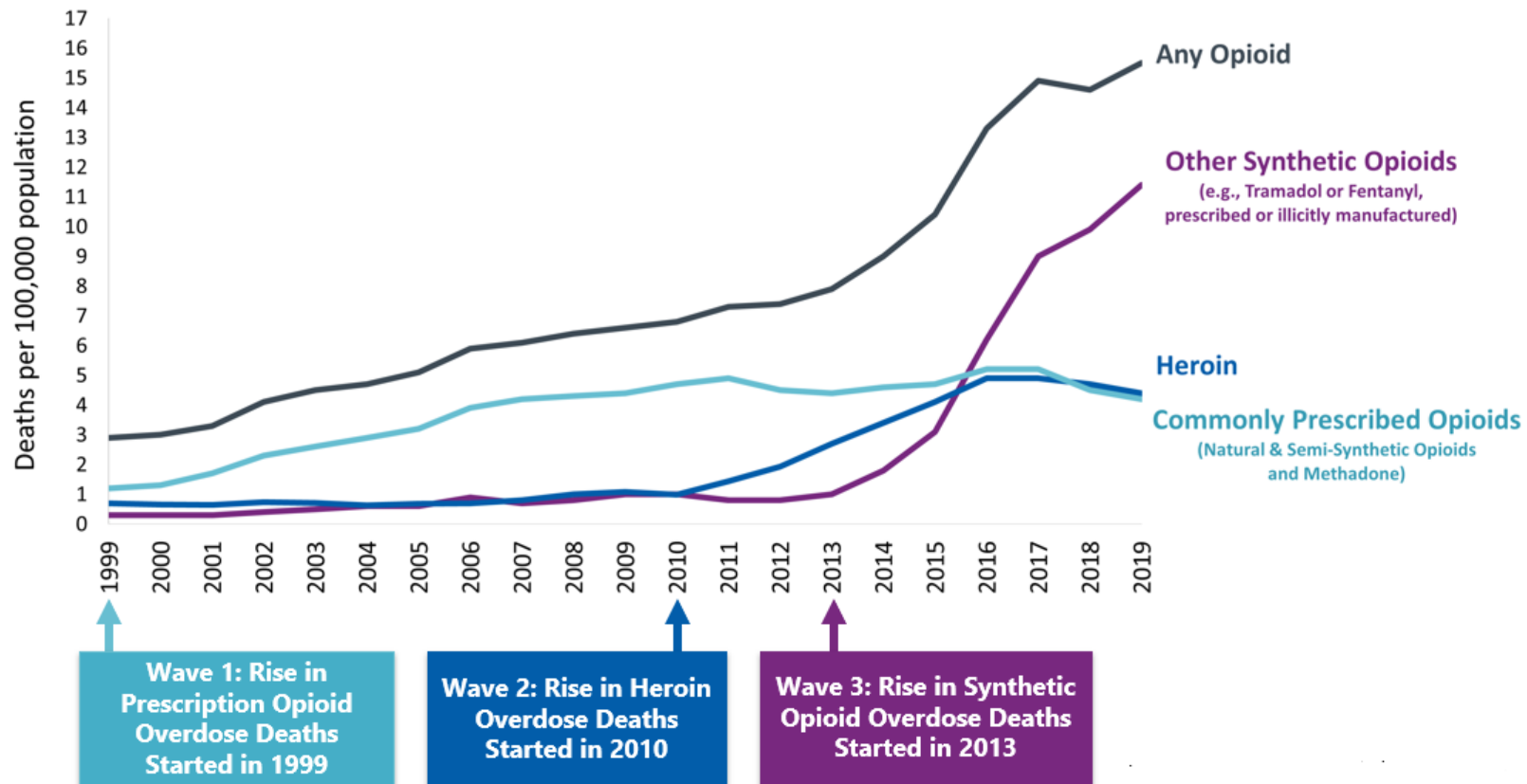
Description of fourth wave clarifies:

◆ It is not:

- Opioid epidemic
- Opioid overdose crisis

◆ But, it is:

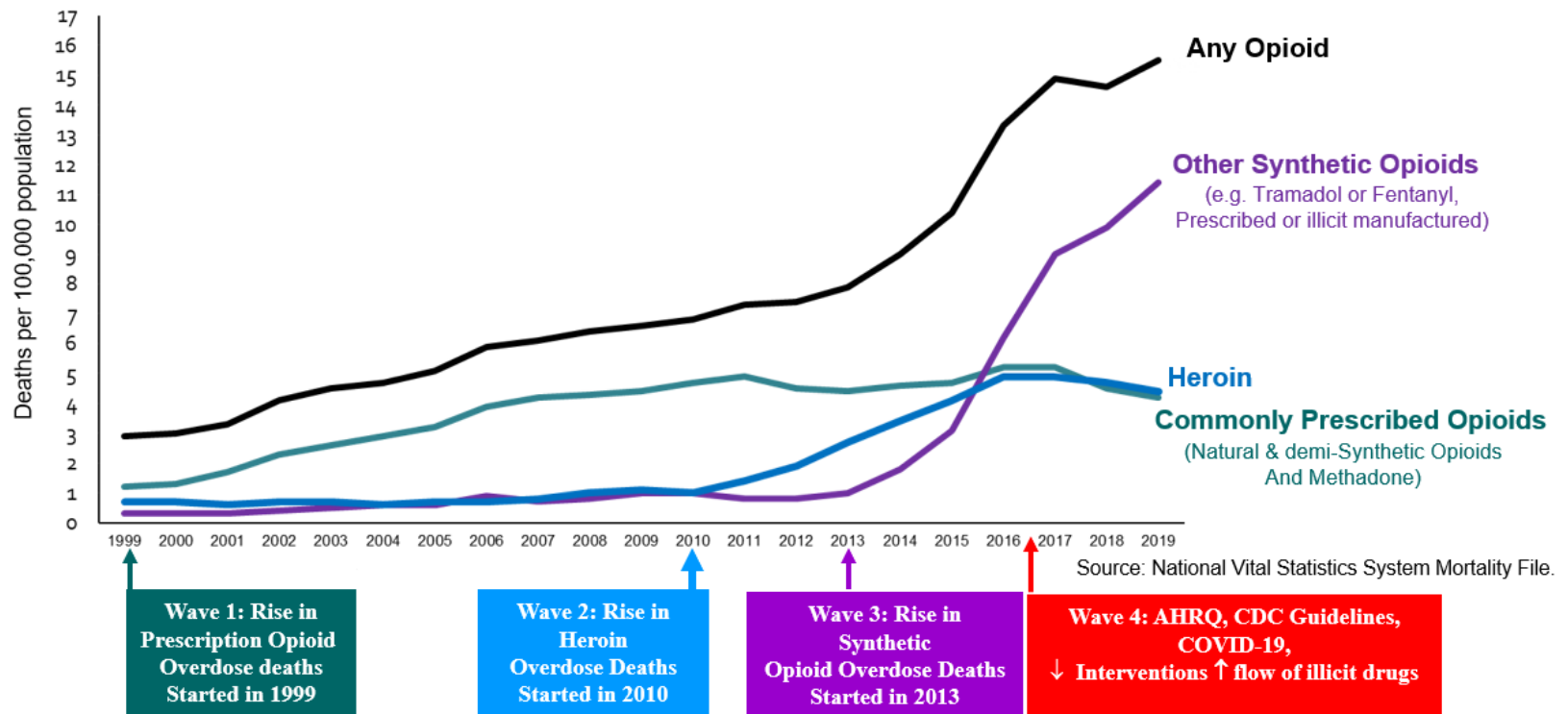
- Illicit drug epidemic
- Illicit drug overdose crisis
- Illicit opioid epidemic
- Illicit opioid overdose crisis



Source: National Vital Statistics System Mortality File.

*Three waves of the rise in opioid overdose deaths.*

## Four Waves of the Rise in Opioid Overdose Deaths



Redrawn and modified from CDC figure



# Drug Overdose Deaths in the U.S. Top 100,000 Annually

- ◆ Provisional data from CDC's
  - An estimated 100,306 drug overdose deaths in the United States during 12-month period ending in April 2021
  - An increase of 28.5% from the 78,056 deaths during the same period the year before.
- ◆ The new data documents that estimated overdose deaths from opioids increased to 75,673 in the 12-month period ending in April 2021, up from 56,064 the year before.
- ◆ Overdose deaths from synthetic opioids (primarily fentanyl) and psychostimulants such as methamphetamine also increased in the 12-month period ending in April 2021.
  - Cocaine deaths also increased, as did deaths from natural and semi-synthetic opioids (such as prescription pain medication).

Health Services Research

## **Fourth Wave of Opioid (Illicit Drug) Overdose Deaths and Diminishing Access to Prescription Opioids and Interventional Techniques: Cause and Effect**

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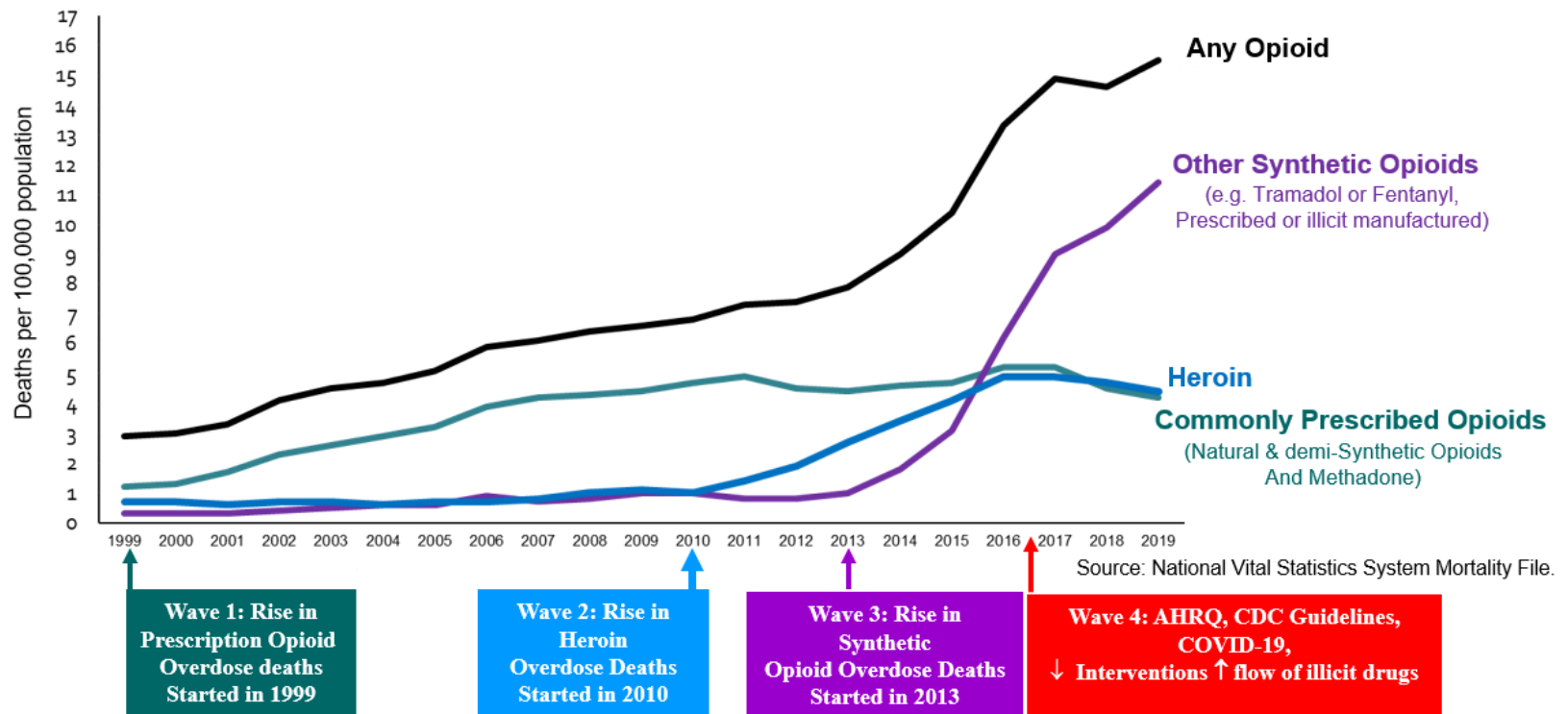
# FOURTH WAVE: CAUSES (Illicit Drug Epidemic)

Confluence of multiple factors

- ◆ Increasing demand with reduced access to opioids
  - CDC guidelines
    - Application and misapplication
    - Converted into regulations
  - Regulatory atmosphere – tragic failure of systems
  - COVID-19 Pandemic
  - Policies of interventional techniques
- ◆ Increased availability of illicit drugs
  - Border policies
  - Cartels

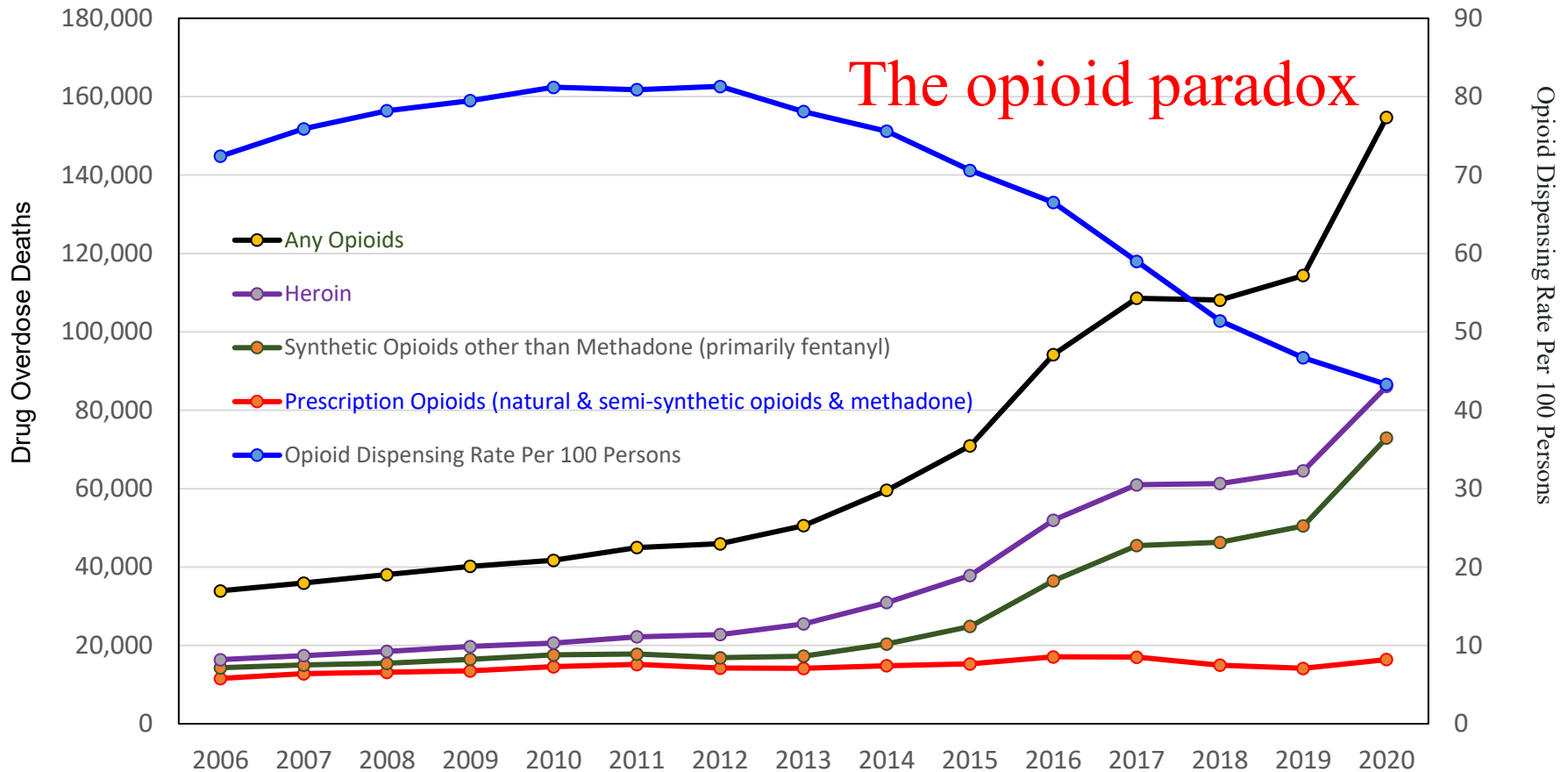
Prescription opioids abuse is least of all problems

## Four Waves of the Rise in Opioid Overdose Deaths

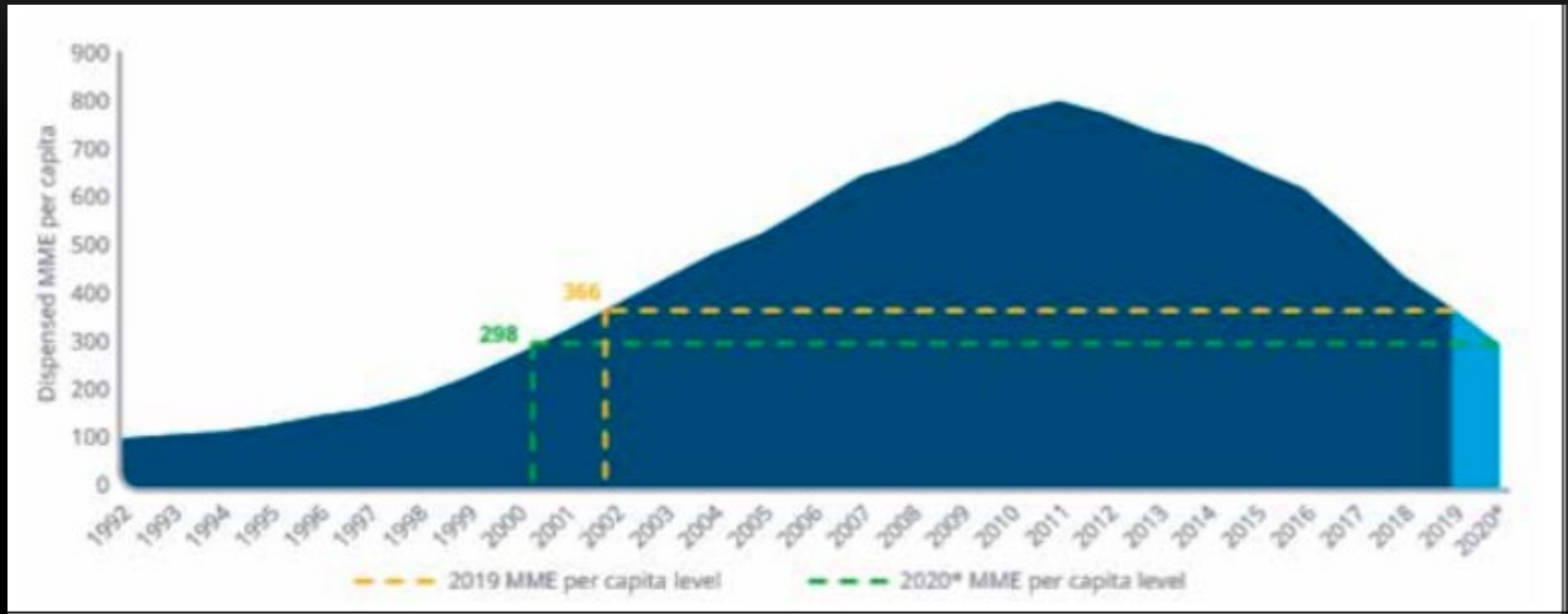


Redrawn and modified from CDC figure

# Opioid prescriptions are declining while opioid overdose deaths are increasing



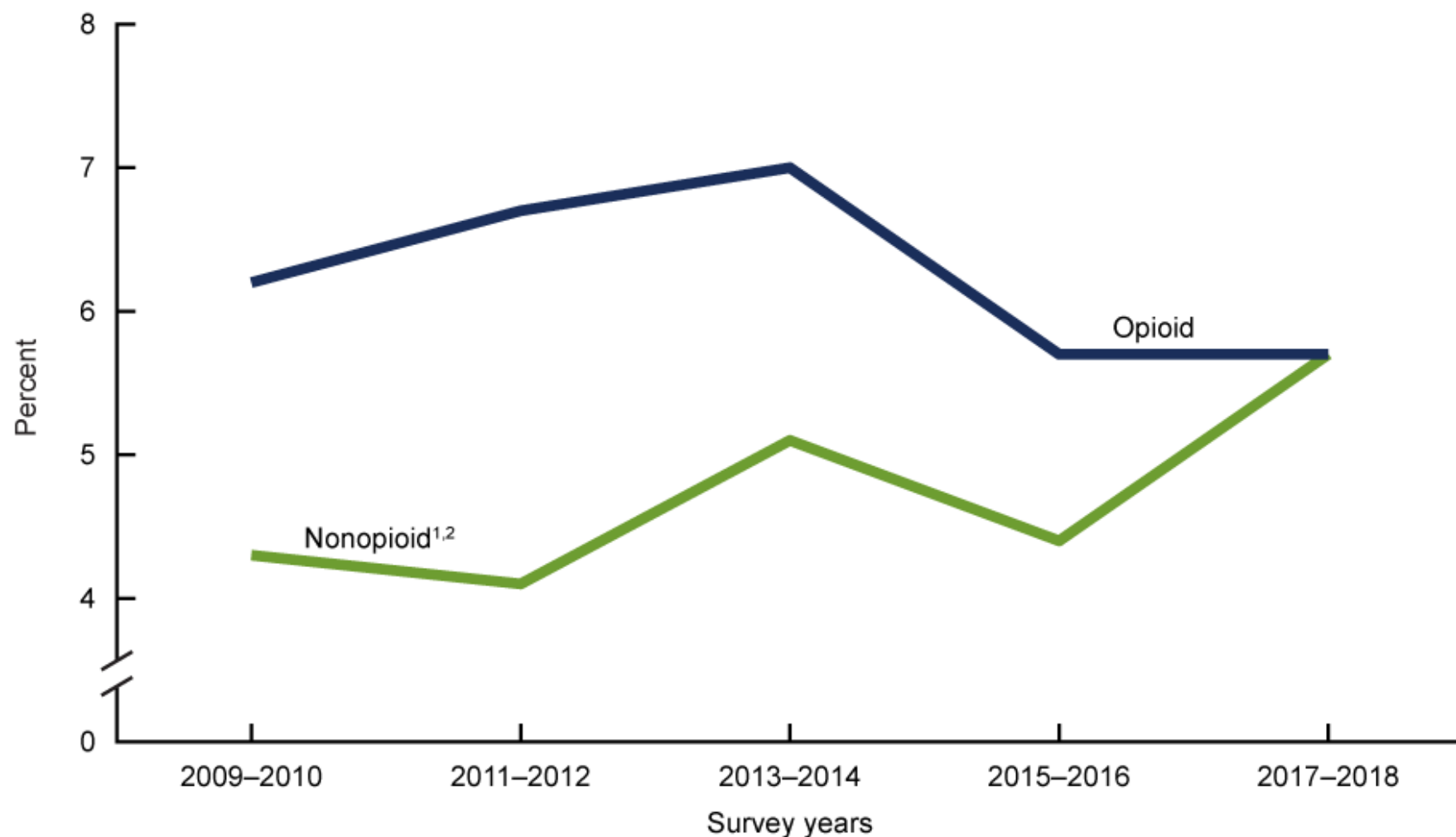
Source: <https://www.cdc.gov/nchs/products/databriefs/db428.htm>  
<https://www.cdc.gov/drugoverdose/rxrate-maps/index.html> Accessed on 1/25/2022



Prescription opioid use in morphine milligram equivalents (MME) per capita, 1992-2020\*.

Source: IQVIA Xponent, Mar 2020; IQVIA Prescription Audit; IQVIA Institute, Nov 2020

Figure 5. Use of prescription opioids and nonopioid prescription pain medications (without prescription opioids) in the past 30 days among adults aged 20 and over: United States, 2009–2010 through 2017–2018



<sup>1</sup>Significant linear trend.

<sup>2</sup>Significant difference between 2015–2016 and 2017–2018.

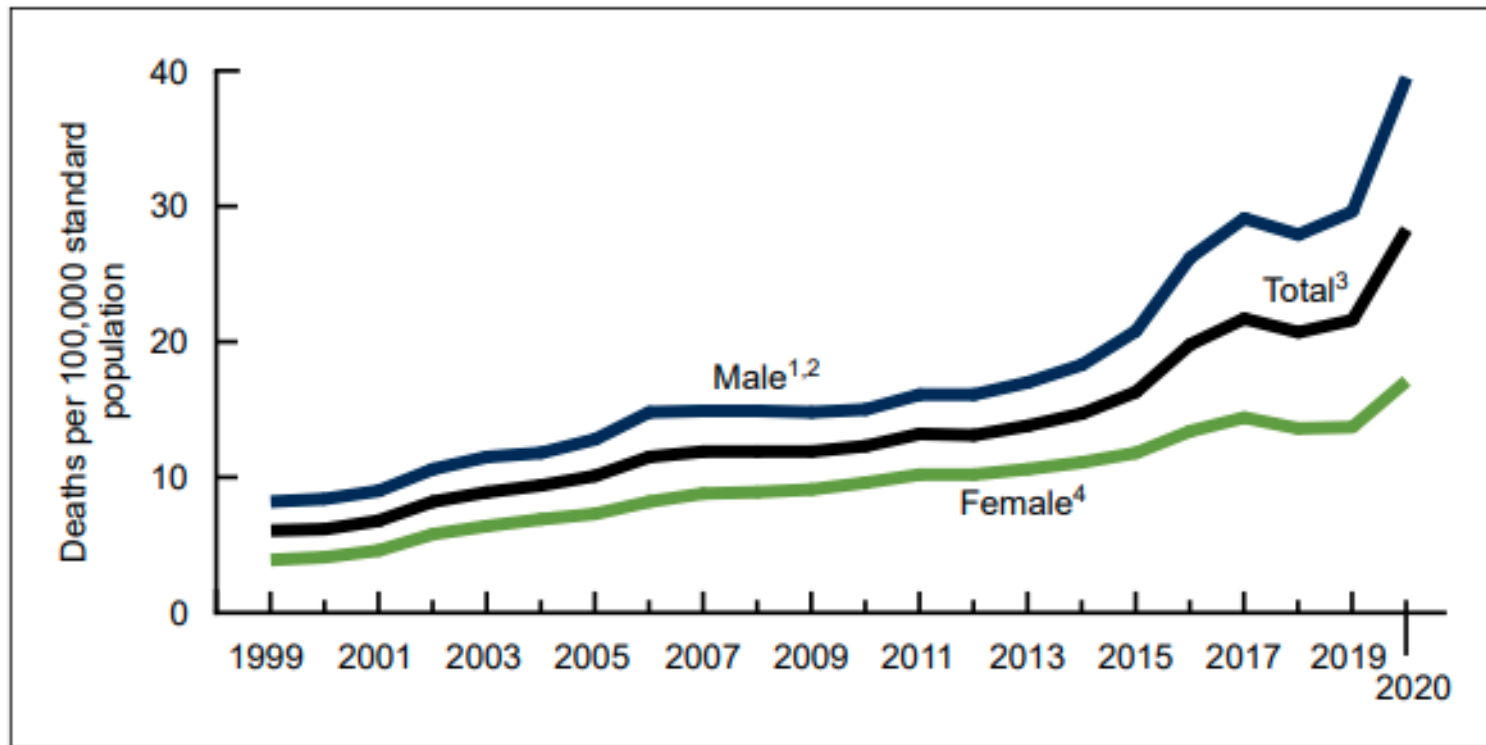
NOTES: Prescription opioid use was defined as using one or more prescription opioids with or without nonopioid prescription pain medications. Use of nonopioid prescription pain medications (without prescription opioids) was defined as using one or more nonopioid prescription pain medications without any use of prescription opioids. Access data table for Figure 5 at: <https://www.cdc.gov/nchs/data/databriefs/db369-tables-508.pdf#5>.

SOURCE: NCHS, National Health and Nutrition Examination Survey, 2009–2018.

# Fourth Wave

- In 2020, the age-adjusted rate of drug overdose deaths in the United States was 31% higher than the rate in 2019.
  - In 2020, 91,799 drug overdose deaths occurred in the United States for an age-adjusted rate of 28.3 per 100,000 standard population. The rate in 2020 (28.3) was 31% higher than the rate in 2019 (21.6)

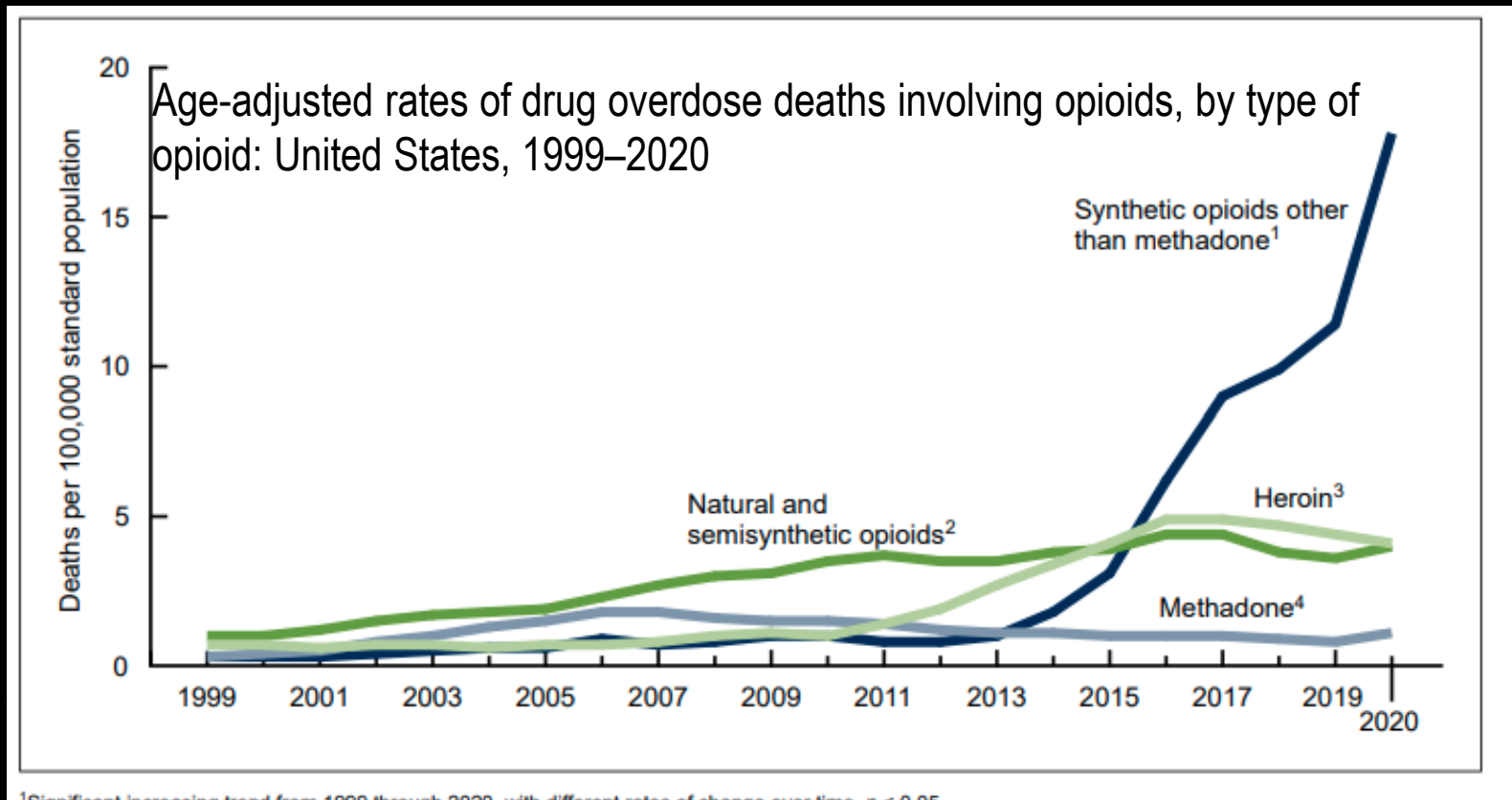
Figure 1. Age-adjusted drug overdose death rates, by sex: United States, 1999–2020





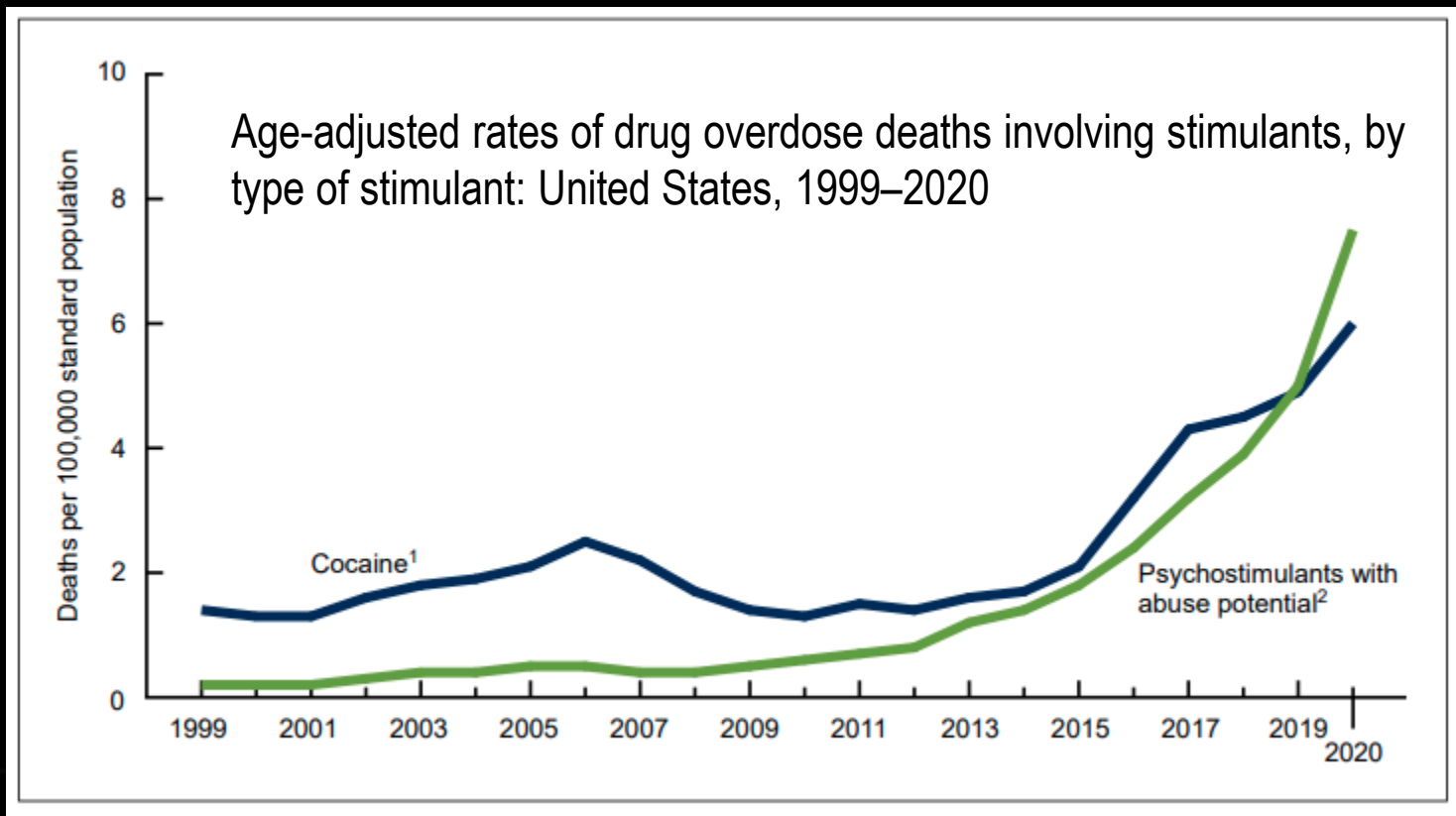
# Fourth Wave

- Since 2016, rates of drug overdose deaths involving opioids have been highest for deaths involving synthetic opioids other than methadone.
  - From 2019 to 2020, the rate increased 56%, from 11.4 to 17.8 per 100,000.
  - The age-adjusted rate of drug overdose deaths involving heroin was increased from 2005 to 2016, and decreased from 2016 through 2020.
  - The drug overdose deaths involving natural and semisynthetic opioids, changed from 2017 (4.4), rates decreased in 2018 (3.8) and 2019 (3.6) but increased in 2020 (4.0).



# Fourth Wave

- The rise in the age-adjusted rates of drug overdose deaths involving cocaine and psychostimulants with abuse potential that began in 2012 continued through 2020.
  - The rate of drug overdose deaths involving cocaine increased 22% in 2020 compared 2019
  - The rate of drug overdose deaths involving psychostimulants with abuse potential increase 50% in 2020 compared 2019.



# Number of National Drug Overdose Deaths Involving Select Prescription and Illicit Drugs

	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Total Overdose Deaths</b>	17,415	38,329	41,340	41,502	43,982	47,055	52,404	63,632	70,237	67,367	70,630	91,799
<b>Any Opioid<sup>1</sup></b>	8,407	21,089	22,784	23,166	25,052	28,647	33,091	42,249	47,600	46,802	49,860	68,630
Any opioid and Synthetic Opioids other than Methadone	205	1,002	961	944	1,219	2,493	4,806	9,299	12,556	13,491	13,596	16,465
<b>Prescription Opioids<sup>2</sup></b>	<b>3,785</b>	<b>14,583</b>	<b>15,140</b>	<b>14,240</b>	<b>14,145</b>	<b>14,838</b>	<b>15,281</b>	<b>17,087</b>	<b>17,029</b>	<b>14,975</b>	<b>14,139</b>	<b>16,416</b>
<b>Prescription Opioids AND Synthetic Opioids other than Methadone</b>	<b>167</b>	<b>939</b>	<b>889</b>	<b>861</b>	<b>1,015</b>	<b>1,489</b>	<b>2,263</b>	<b>4,055</b>	<b>5,444</b>	<b>5,417</b>	<b>5,876</b>	<b>8,626</b>
<b>Prescription Opioids WITHOUT Synthetic Opioids other than Methadone</b>	<b>3,618</b>	<b>13,644</b>	<b>14,251</b>	<b>13,379</b>	<b>13,130</b>	<b>13,349</b>	<b>13,018</b>	<b>13,032</b>	<b>11,585</b>	<b>9,558</b>	<b>8,263</b>	<b>7,790</b>
Synthetic Opioids other than Methadone (primarily fentanyl) <sup>3</sup>	782	3,007	2,666	2,628	3,105	5,544	9,580	19,413	28,466	31,335	36,359	56,516
<b>Heroin<sup>4</sup></b>	<b>1,842</b>	<b>3,036</b>	<b>4,397</b>	<b>5,925</b>	<b>8,257</b>	<b>10,574</b>	<b>12,989</b>	<b>15,469</b>	<b>15,482</b>	<b>14,996</b>	<b>14,019</b>	<b>13,165</b>
<b>Cocaine<sup>5</sup></b>	<b>3,544</b>	<b>4,183</b>	<b>4,681</b>	<b>4,404</b>	<b>4,944</b>	<b>5,415</b>	<b>6,784</b>	<b>10,375</b>	<b>13,942</b>	<b>14,666</b>	<b>15,883</b>	<b>19,447</b>
<b>Psychostimulants With Abuse Potential (primarily methamphetamine)<sup>6</sup></b>	<b>578</b>	<b>1,854</b>	<b>2,266</b>	<b>2,635</b>	<b>3,627</b>	<b>4,298</b>	<b>5,716</b>	<b>7,542</b>	<b>10,333</b>	<b>12,676</b>	<b>16,167</b>	<b>23,837</b>
<b>Benzodiazepines<sup>7</sup></b>	<b>1,298</b>	<b>6,497</b>	<b>6,872</b>	<b>6,524</b>	<b>6,973</b>	<b>7,945</b>	<b>8,791</b>	<b>10,684</b>	<b>11,537</b>	<b>10,724</b>	<b>9,711</b>	<b>12,290</b>
<b>Antidepressants<sup>8</sup></b>	<b>1,798</b>	<b>3,889</b>	<b>4,113</b>	<b>4,259</b>	<b>4,458</b>	<b>4,768</b>	<b>4,894</b>	<b>4,812</b>	<b>5,269</b>	<b>5,064</b>	<b>5,175</b>	<b>5,597</b>

Source: <https://nida.nih.gov/drug-topics/trends-statistics/overdose-death-rates>. Accessed on 2/7/2022

<sup>1</sup>See <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm> for technical information.

<sup>1</sup> Any Opioid ICD-10 codes (T40.0-T40.4, T40.6)

<sup>2</sup> Prescription Opioids ICD-10 codes (T40.2-T40.3)

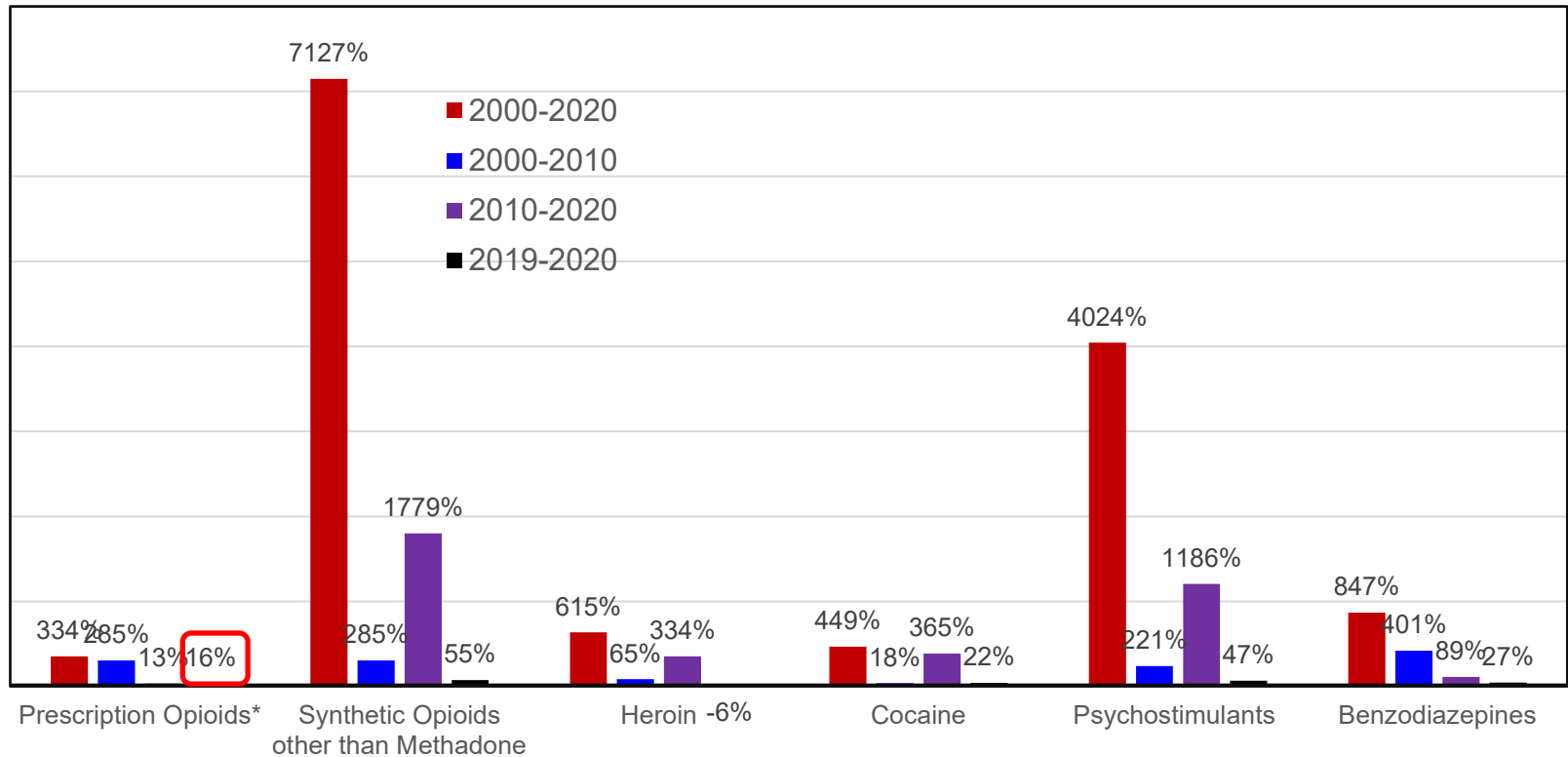
<sup>4</sup>Heroin ICD-10 codes (T40.1)

<sup>5</sup>Cocaine ICD-10 codes (T40.5)

<sup>7</sup>Benzodiazepines ICD-10 code(T42.4)

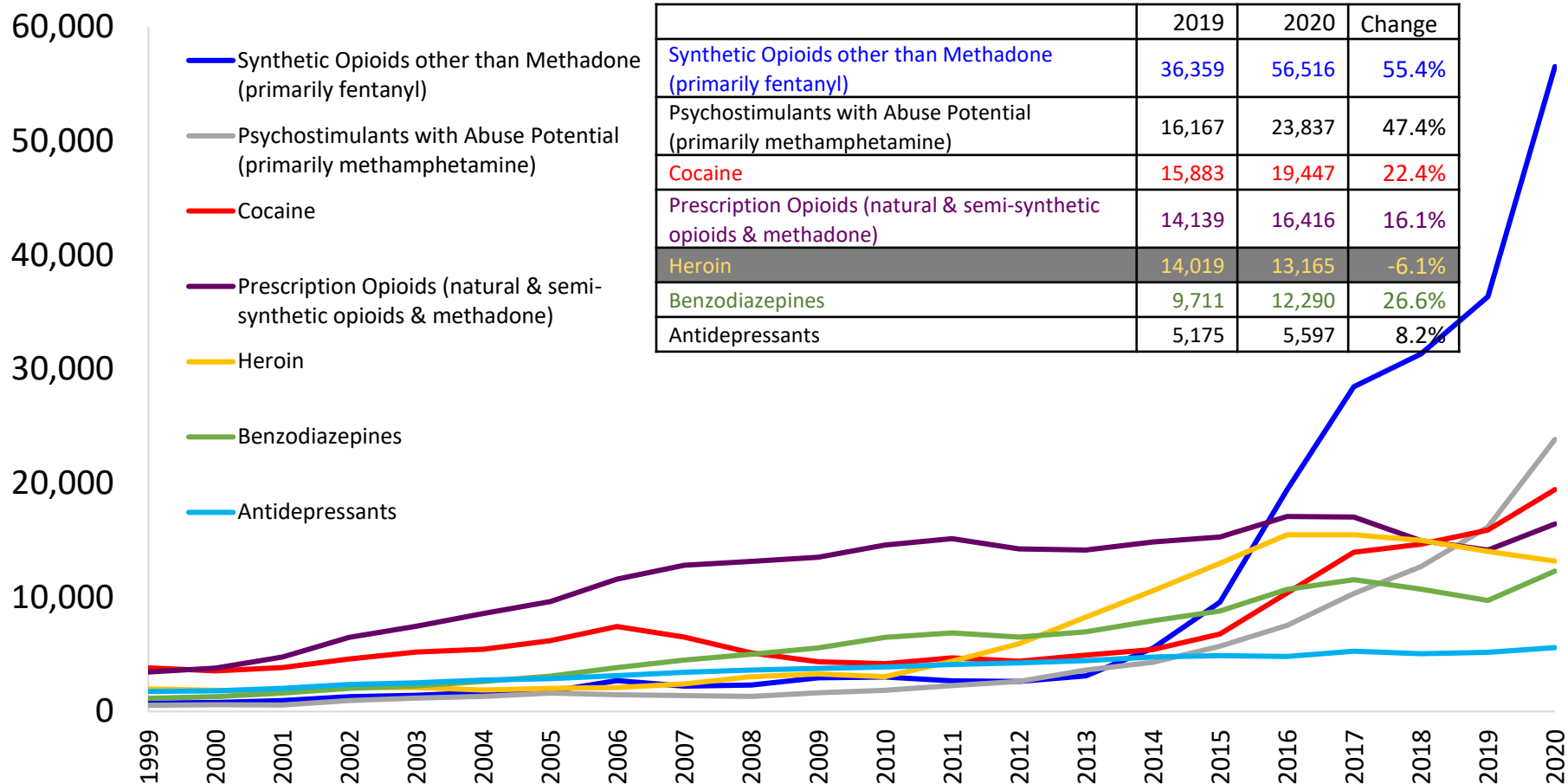
<sup>8</sup>Antidepressants ICD-10 code(T43.0-T43.2)

# Quantification of Opioid Deaths 2000-2020



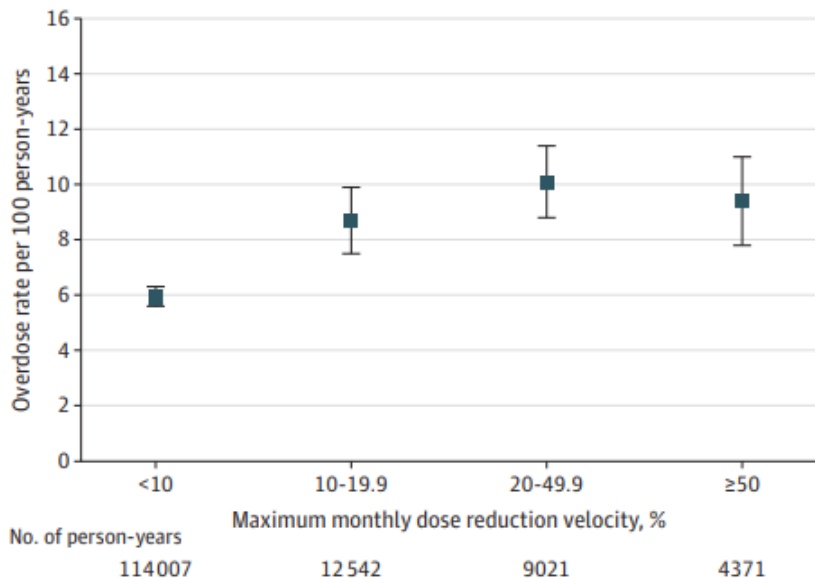
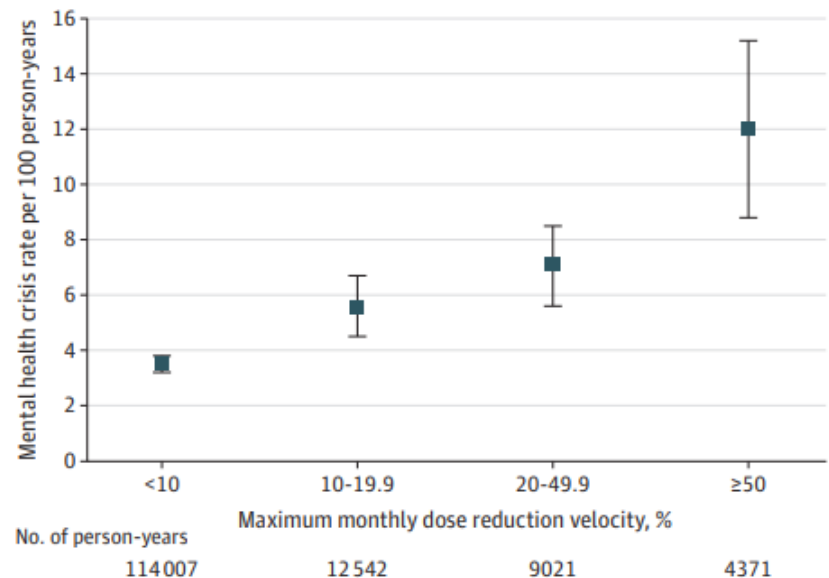
							Change			
							2000-2020	2000-2010	2010-2020	2019-2020
Prescription Opioids (natural & semi-synthetic opioids & methadone)	3,785	14,583	17,029	14,975	14,139	16,416	334%	285%	13%	16%
Synthetic Opioids other than Methadone (primarily fentanyl)	782	3,007	28,466	31,335	36,359	56,516	7127%	285%	1779%	55%
Heroin	1,842	3,036	15,482	14,996	14,019	13,165	615%	65%	334%	-6%
Cocaine	3,544	4,183	13,942	14,666	15,883	19,447	449%	18%	365%	22%
Psychostimulants	578	1,854	10,333	12,676	16,167	23,837	4024%	221%	1186%	47%
Benzodiazepines	1,298	6,497	11,537	10,724	9,711	12,290	847%	401%	89%	27%

# National Drug-Involved Overdose Deaths\*, Number Among All Ages, 1999-2020



\*Includes deaths with underlying causes of unintentional drug poisoning (X40–X44), suicide drug poisoning (X60–X64), homicide drug poisoning (X85), or drug poisoning of undetermined intent (Y10–Y14), as coded in the International Classification of Diseases, 10th Revision. Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999–2020 on CDC WONDER Online Database, released 12/2021.

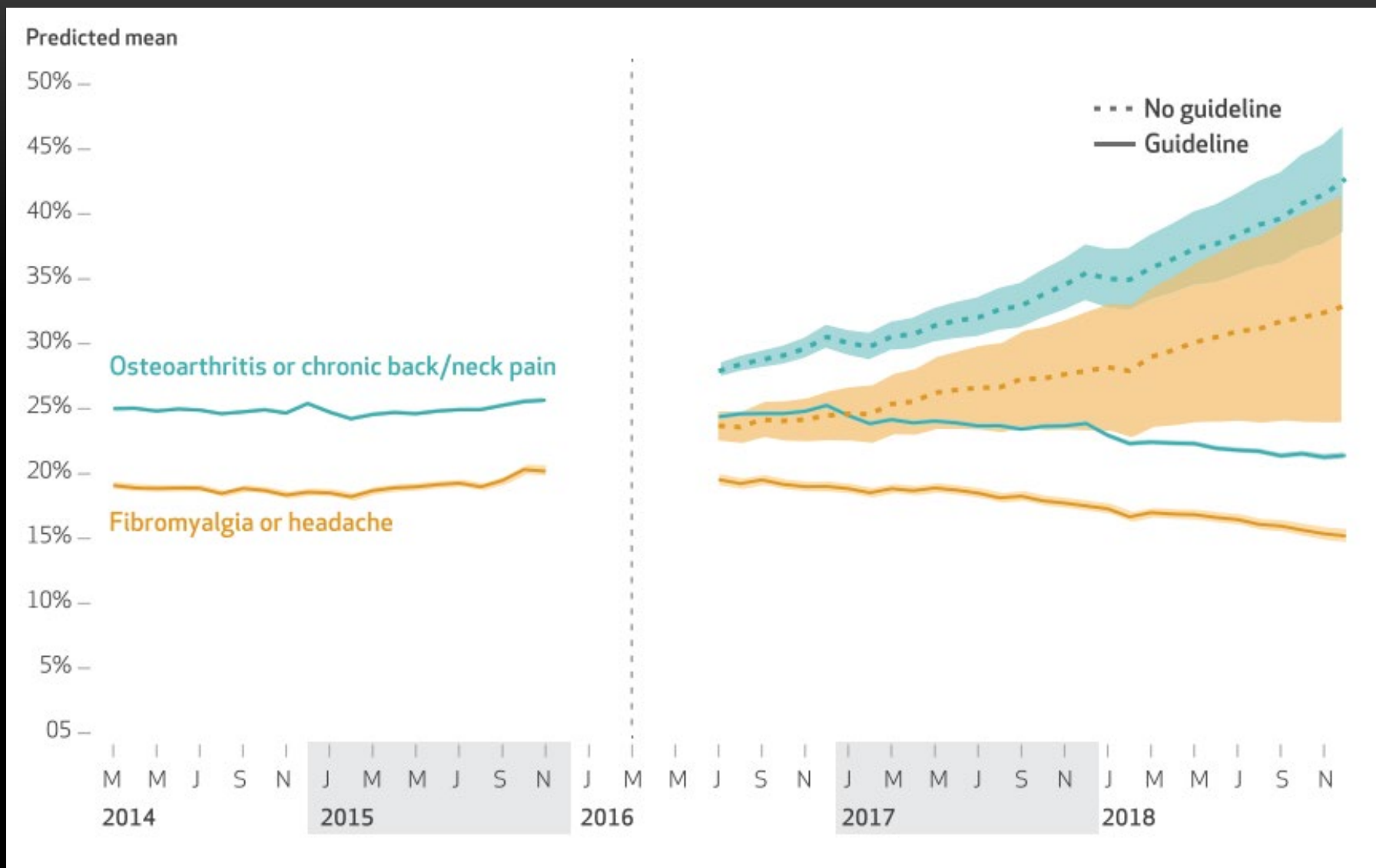
# **Effect of CDC Guidelines**

**A** Overdose**B** Mental health crisis

A total of 109 223 patients and 139 941 person-years of follow-up are included in the analyses. Monthly outcome counts during follow-up were modeled as a function of the maximum monthly rate of dose reduction during any previous 60-day period. Thus, the less than 10% category may include patient periods prior to tapering, patients with gradual dose reductions, or patients with no dose change. Of the total cohort of 113 618 patients, 4395 (3.9%) were not included in these analyses due to an absence of follow-up time beyond the initial 60-day period or a dose increase of greater than or equal to 15% relative

to baseline in the first 60 days. Plotted estimates are adjusted for patient age, sex, education, rurality of home address, commercial vs Medicare Advantage insurance, baseline opioid dose, co-prescription of benzodiazepines, study year, number of overdose events in the baseline period, baseline depression or anxiety, alcohol use disorder, drug use disorder, psychosis, and 24 other noncancer comorbidities included in the Elixhauser comorbidity index. Error bars show 95% CIs.

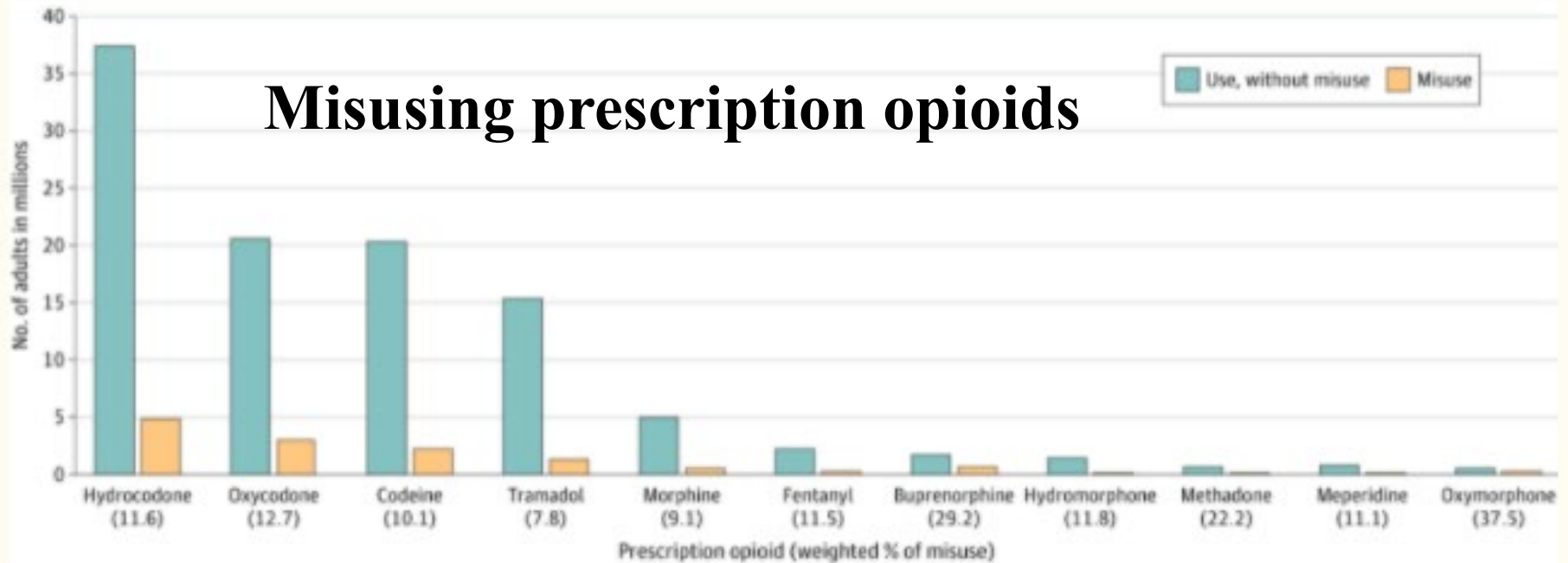
*Adjusted event rates for overdose and mental health crisis events  
related to **opioid tapering***



*Predicted rate of one or more opioid prescription fills among commercially insured nonelderly US adults with selected noncancer pain with and without the Centers for Disease Control and Prevention guideline (observed versus counterfactual), by cohort, 2014-2018.*

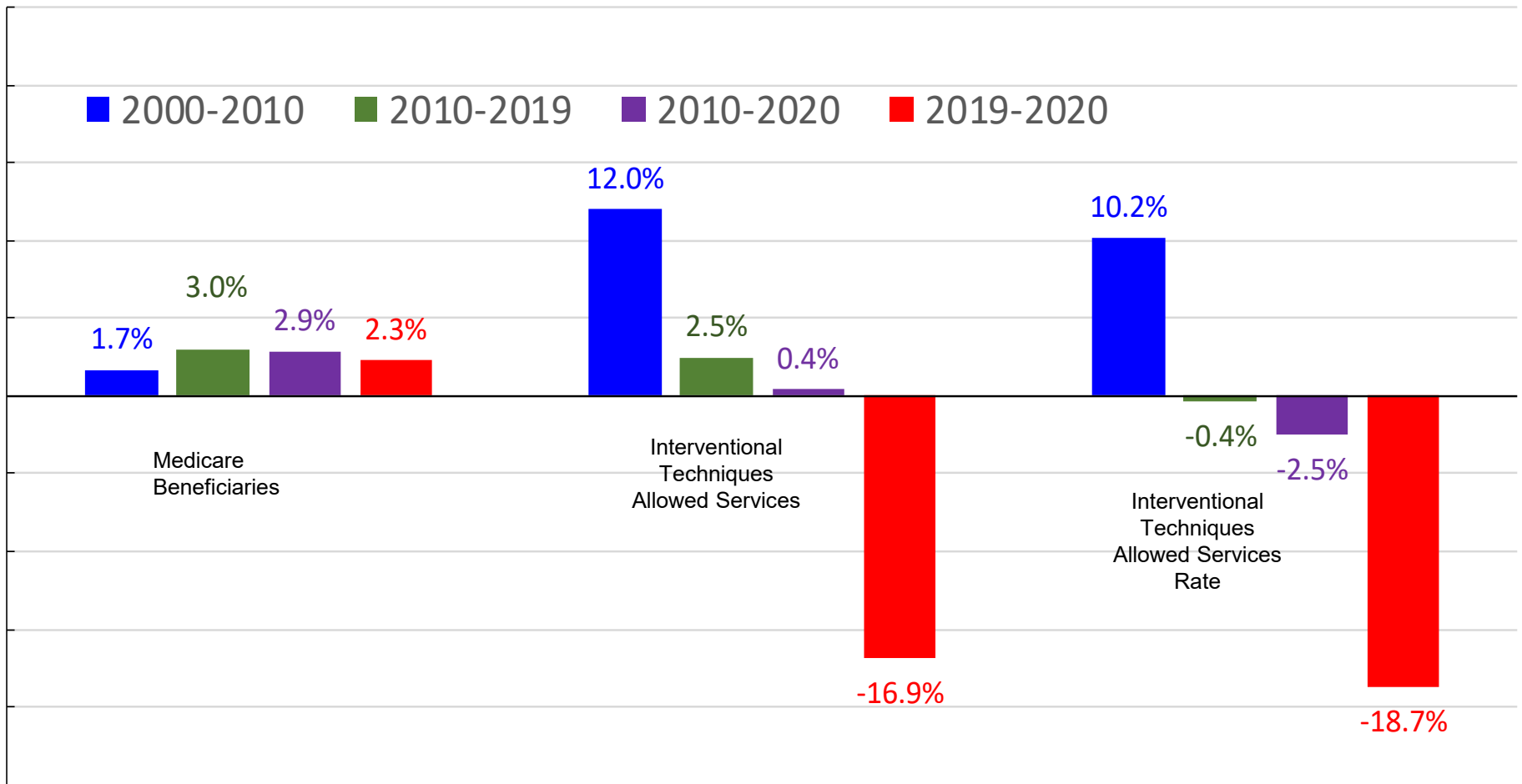


## Misusing prescription opioids

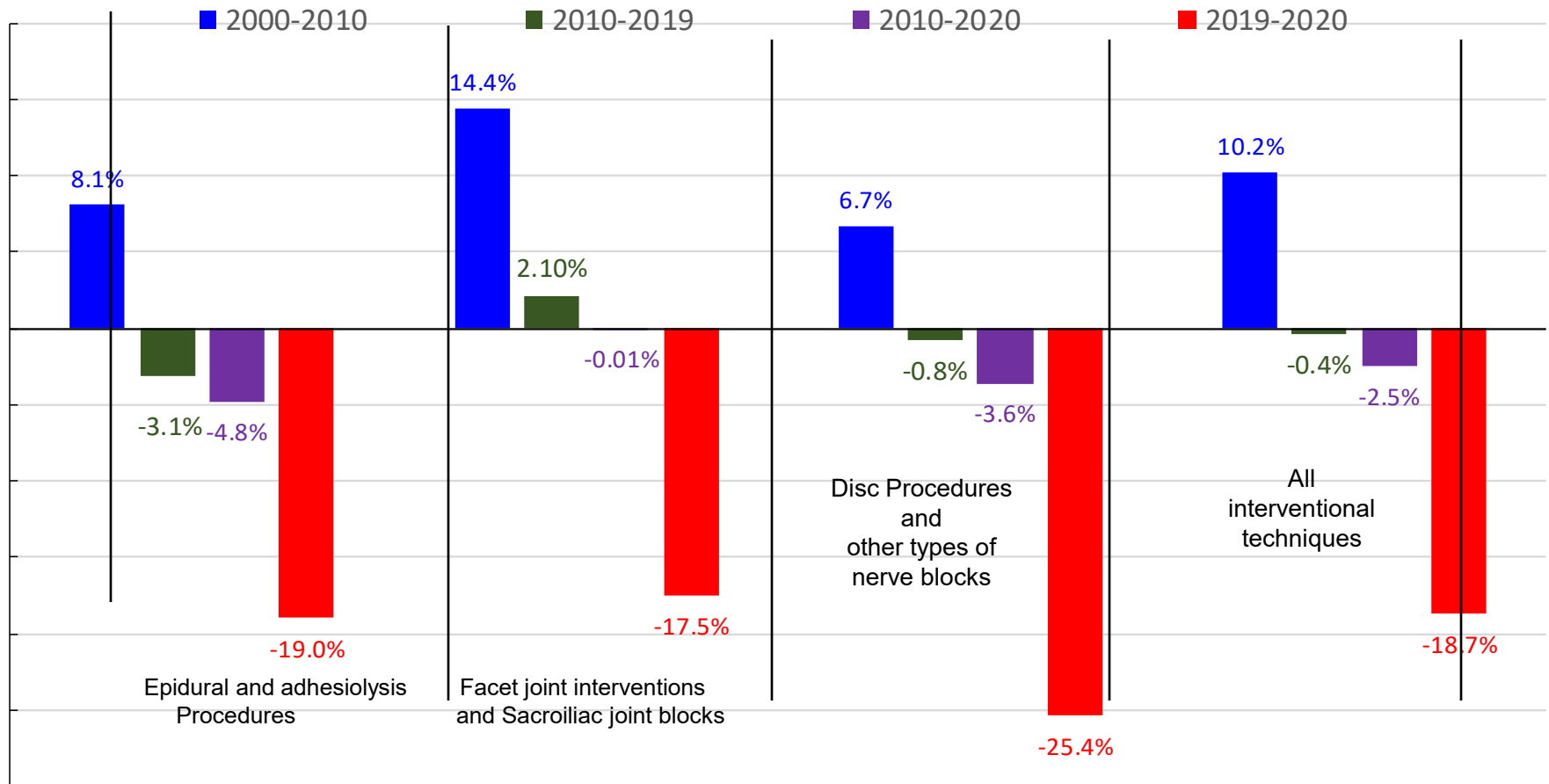


*US adults who reported using or misusing prescription opioids in the past 12 months.*

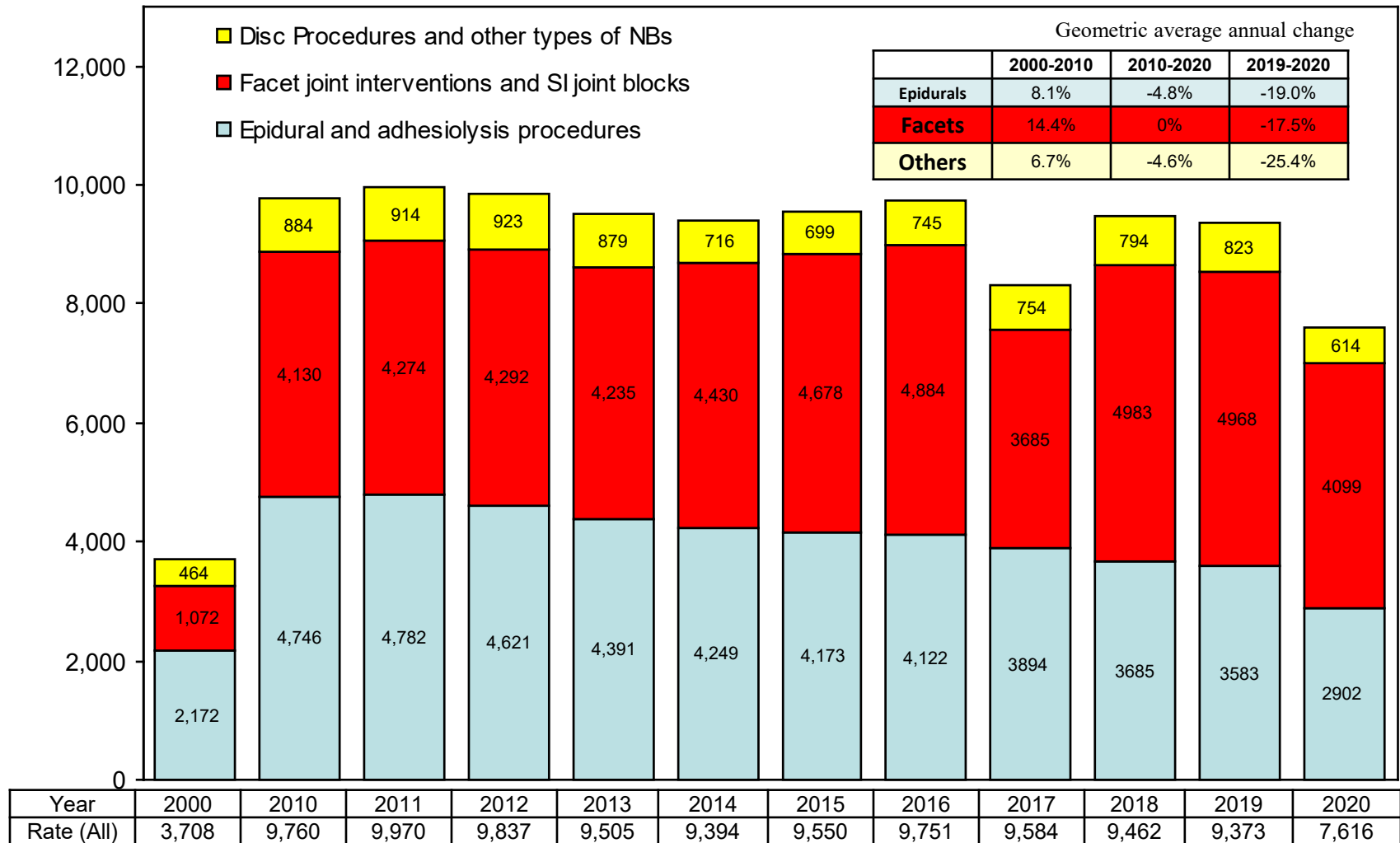
# Interventional Techniques



Comparative analysis of annual US population growth, Medicare participation and utilization of interventional pain management services from 2000-2020

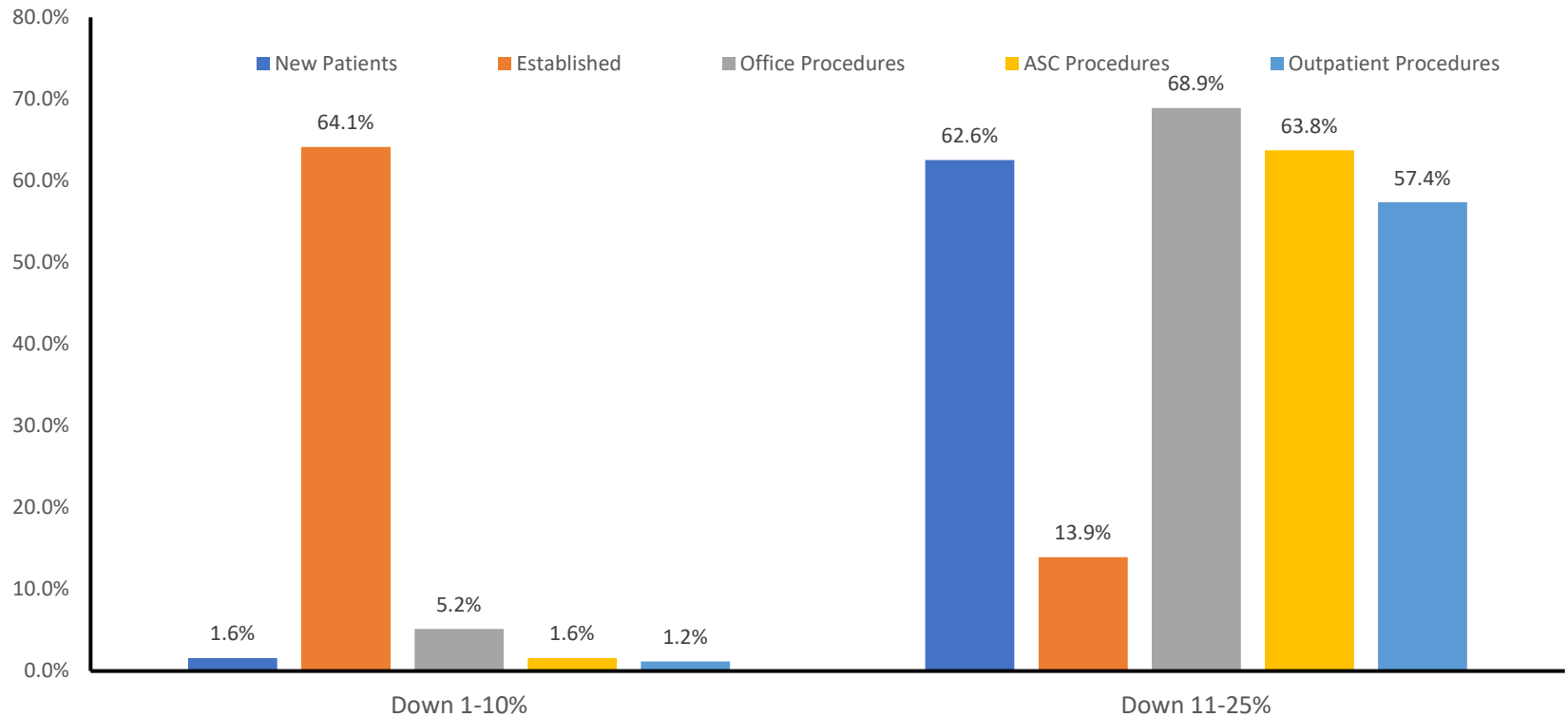


**Comparative analysis of IPM Procedures (geometric mean)**

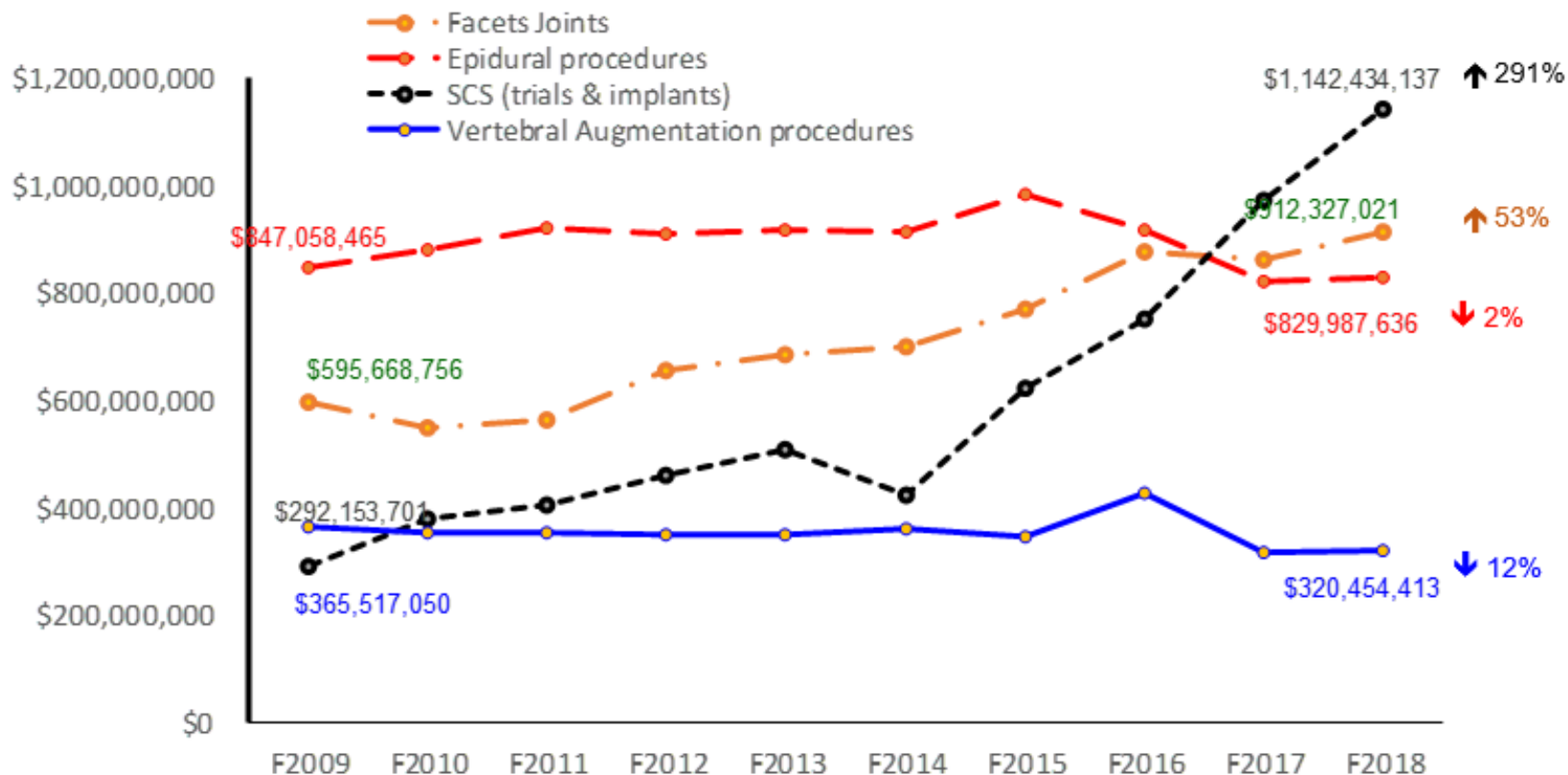


Distribution of procedural characteristics (Rates) by type of procedures from 2000 to 2020

# Impact of COVID on procedural and overall patient volume



**Source: The impact of COVID-19 on interventional pain management practices is significant and long-lasting: an interventional pain management physician survey**



Total cost of facets, epidurals, SCS and vertebral augmentation procedures.

# Thank You

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