

# Fentanyl and Carfentanil Effects/Issues/Treatment

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**NDCI**  
NATIONAL DRUG  
COURT INSTITUTE

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# Session Goals



## Objectives of Session:

- 1. Provide a description of the various issues that make working with OUD different from other substances**
- 2. Increase understanding of effective treatment interventions for OUD**
- 3. Increase understanding of why MAT is so important**



# 107,000 Drug Overdose Deaths in 2021





# What We Are Seeing



NATIONAL

## Overdoses Involving Cocaine and Fentanyl Are On The Rise

Updated July 7, 2021 · 2:11 PM ET ⓘ

Heard on [All Things Considered](#)



# What We Are Seeing



Sep 14, 2022 - News

## Georgia sees drastic rise in fentanyl-related deaths in teens



Thomas Wheatley

# 800% Increase

# What We Are Seeing



# What We Are Seeing



## Fentanyl kills Georgians at alarming rates during pandemic





# What We Are Seeing



## Local Outreach Program Warns of Heroin Batch Testing Positive for Fentanyl



The Evansville Recovery Alliance says an overdose involving Fentanyl may require multiple doses of Narcan.

Posted: Jul 6, 2021 9:31 AM

Updated: Jul 6, 2021 11:35 AM

Posted By: Tommy Mason



The Evansville Recovery Alliance is sending out a warning that a recent batch of heroin in the area has tested positive for the drug fentanyl.

The organization says, anyone, can overdose any time a substance is abused, but that fentanyl increases those chances.



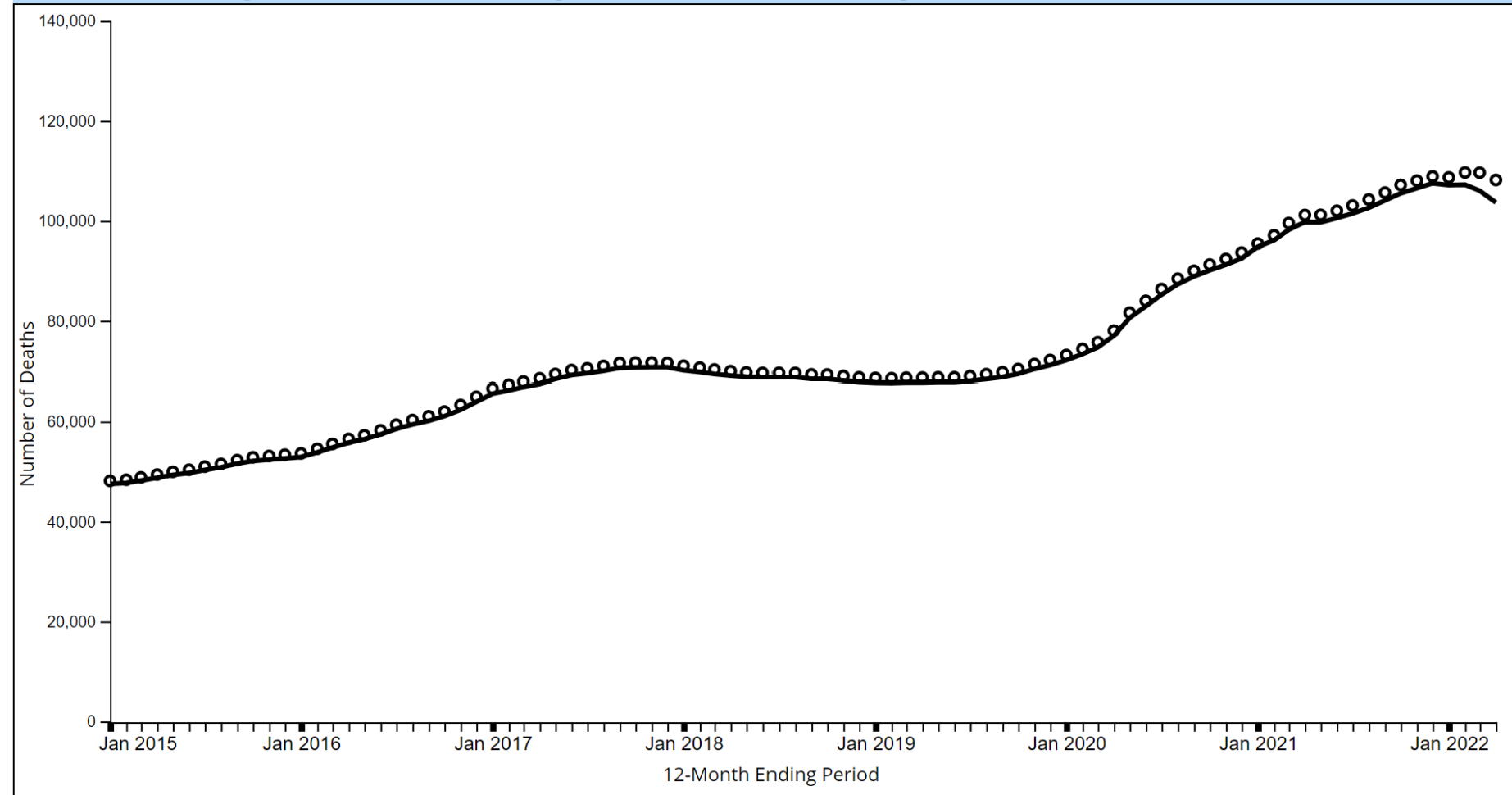
# What We Are Seeing



# National Drug Overdoses (all classes)



Figure 1a. 12 Month-ending Provisional Counts of Drug Overdose Deaths: United States

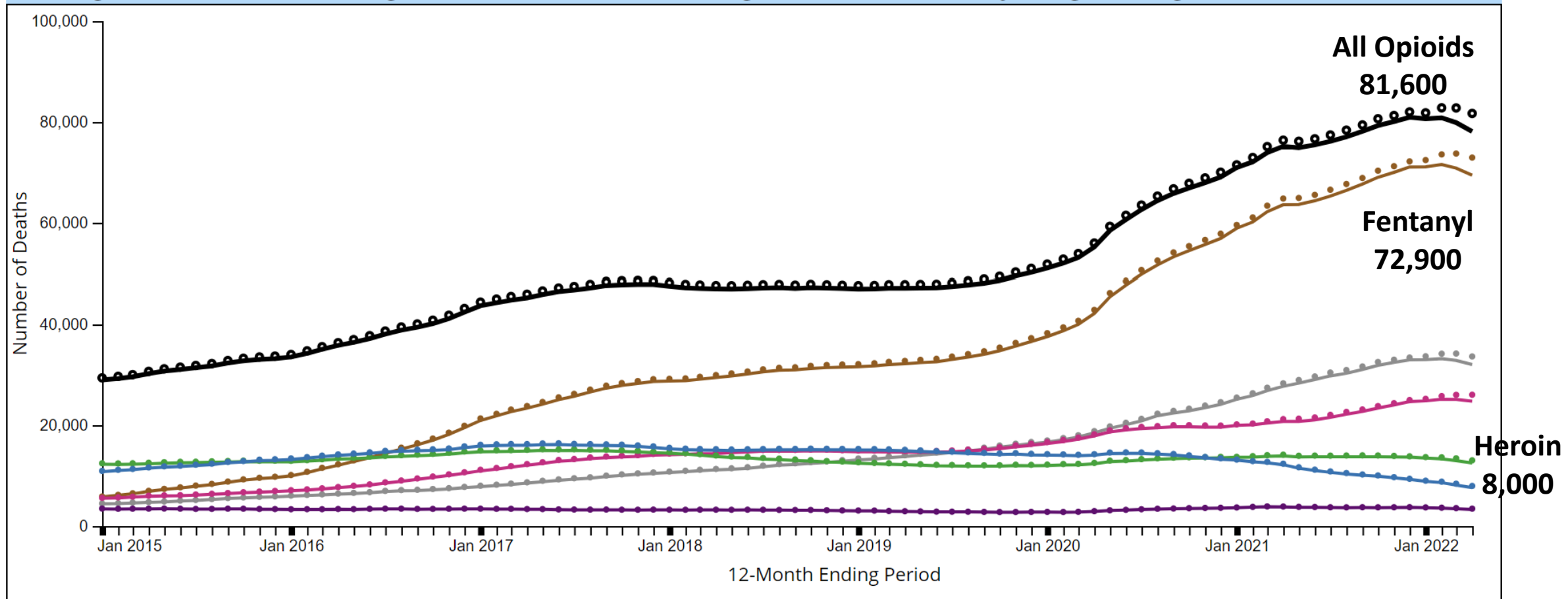




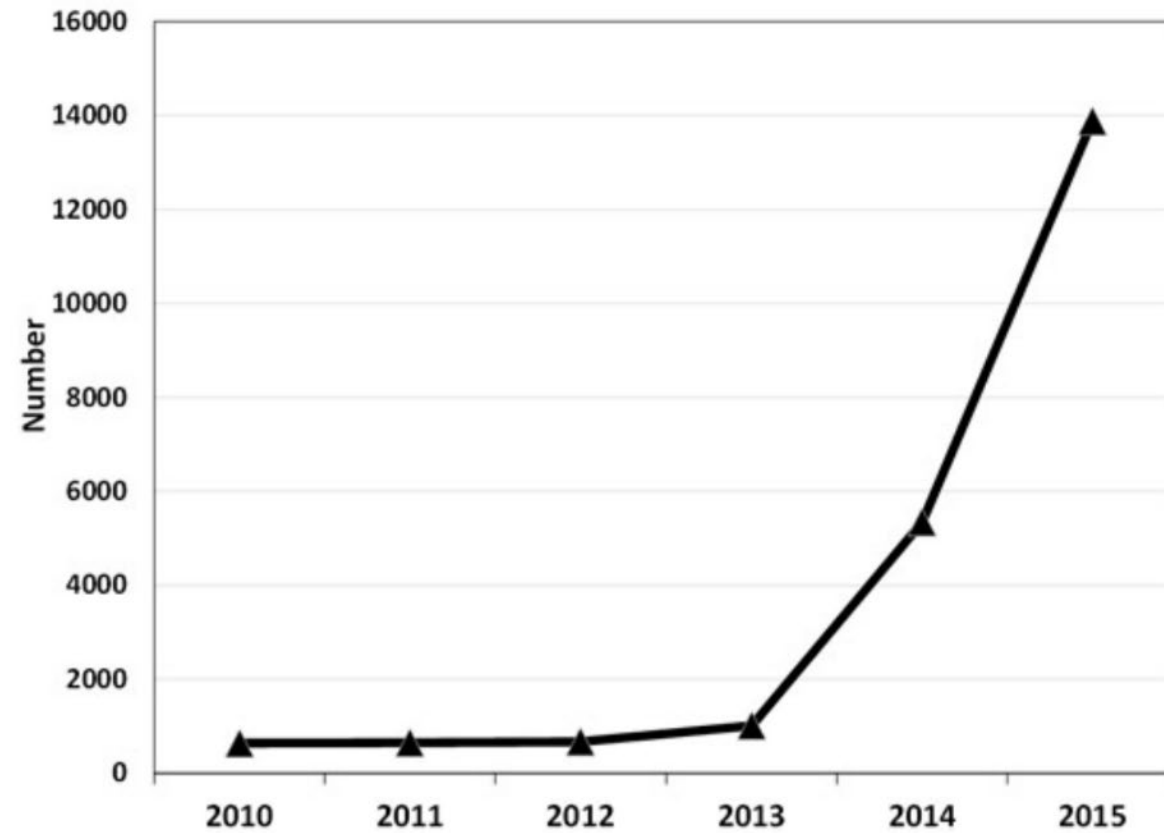
# Opioid Overdoses by Drug



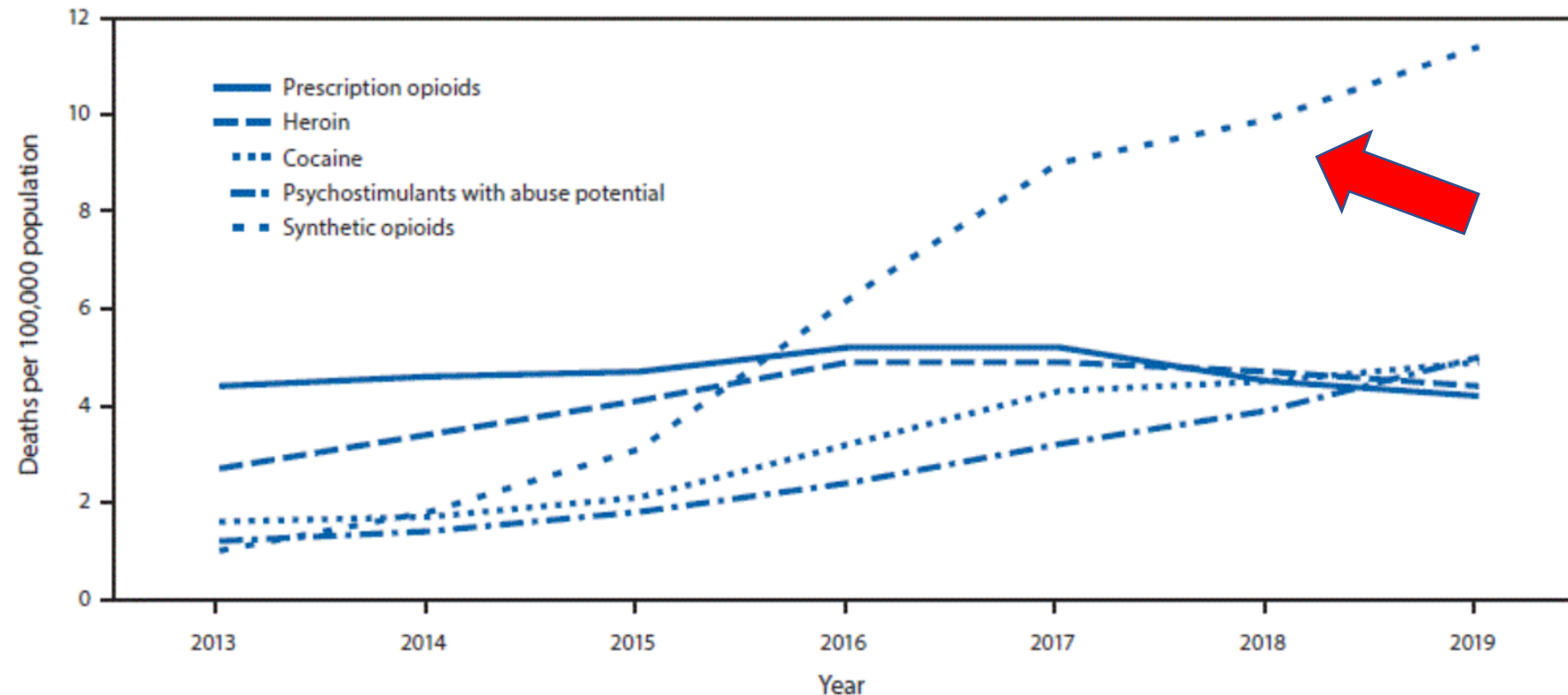
Figure 2. 12 Month-ending Provisional Number of Drug Overdose Deaths by Drug or Drug Class: United States



Number of Reported Law Enforcement Encounters  
Testing Positive for Fentanyl in the US: 2010 - 2015



**FIGURE 1. Age-adjusted rates\* of drug overdose deaths<sup>†</sup> involving prescription opioids,<sup>§</sup> heroin,<sup>¶</sup> cocaine,\*\* psychostimulants with abuse potential,<sup>††</sup> and synthetic opioids other than methadone<sup>§§,¶¶</sup> — United States, 2013–2019**



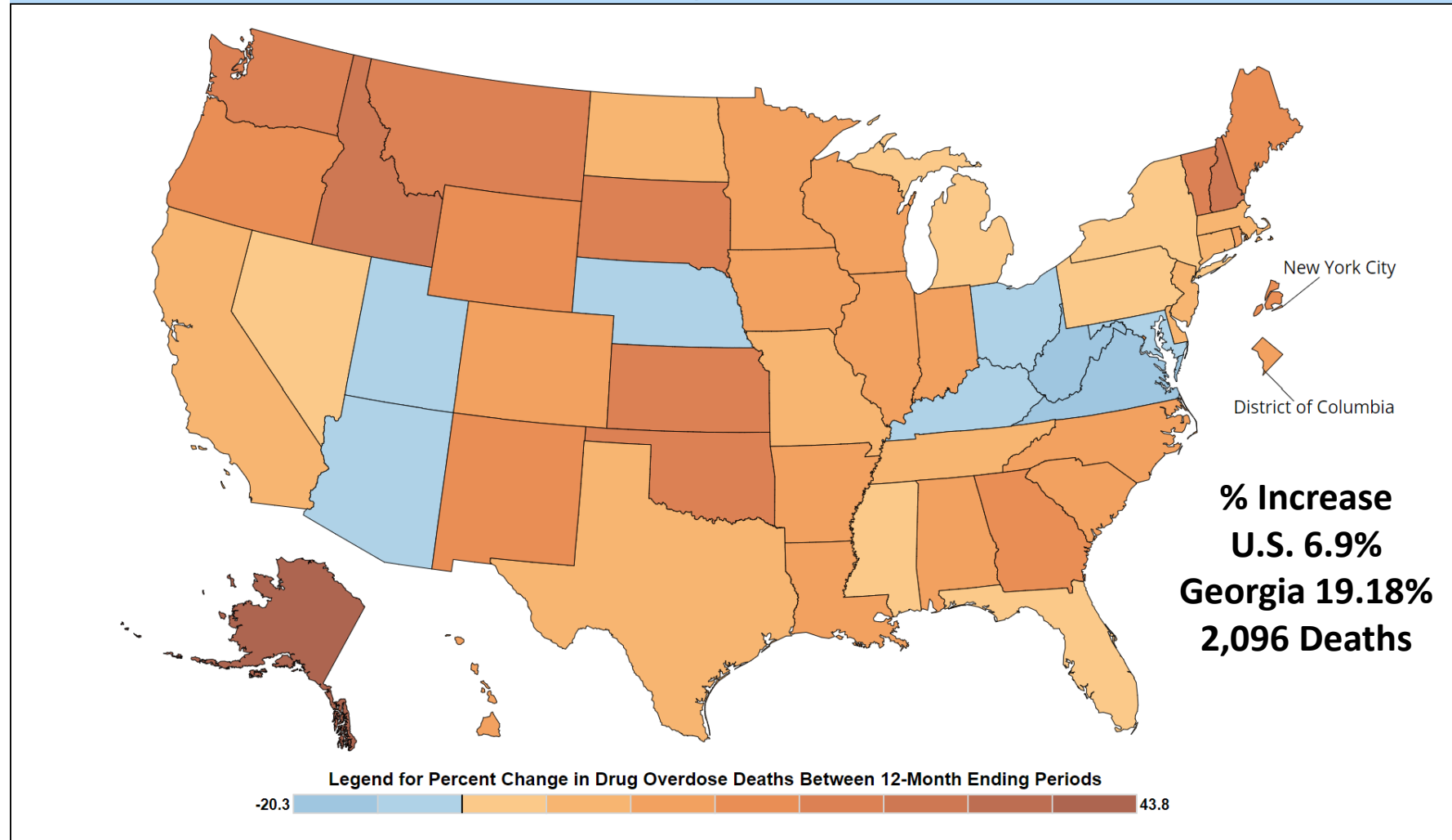
**Source:** National Vital Statistics System, Mortality File. <https://wonder.cdc.gov/>



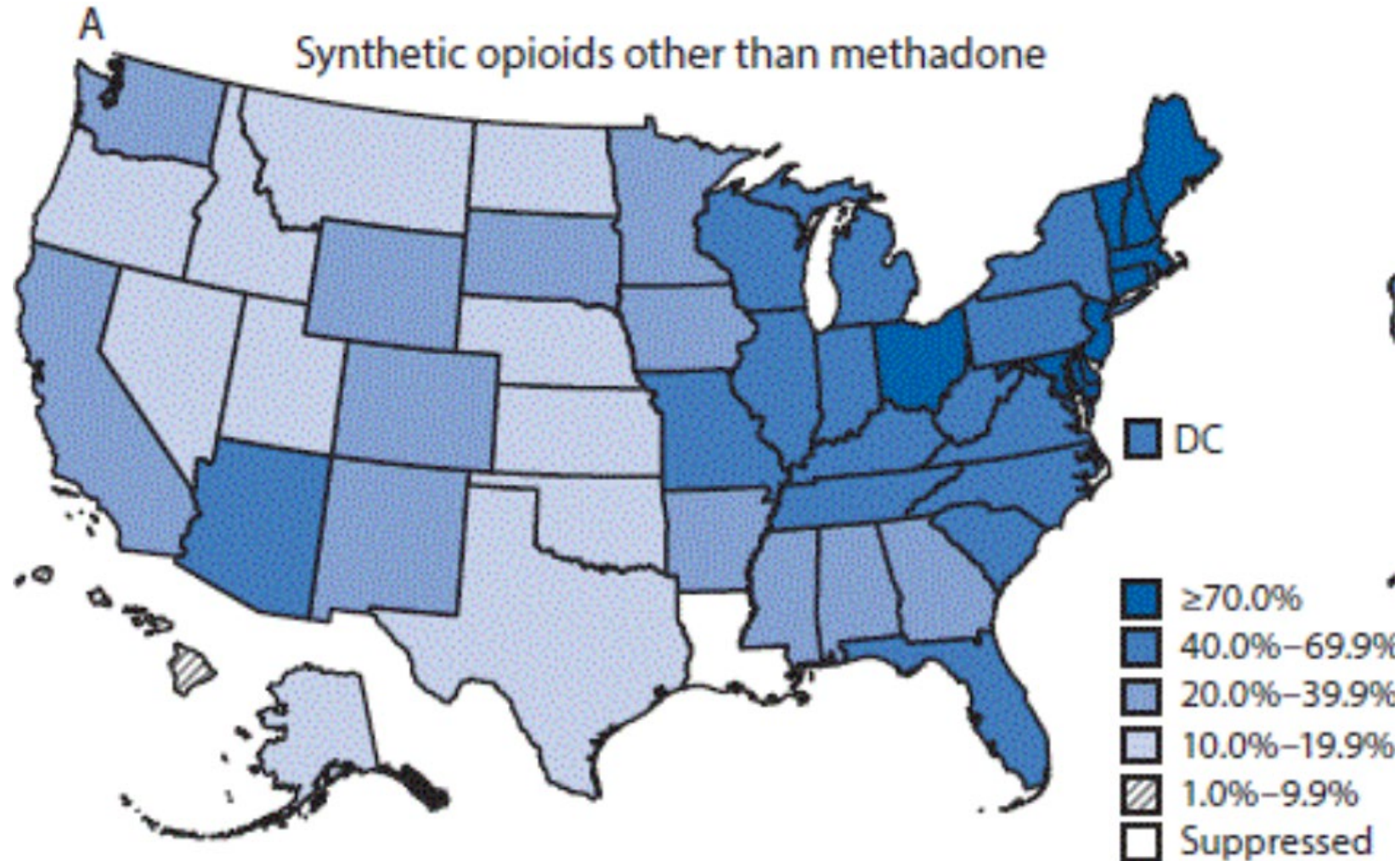
# Increase In Drug Overdoses 4/22 vs. 4/21



Figure 1b. Percent Change in Predicted 12 Month-ending Count of Drug Overdose Deaths, by Jurisdiction: April 2021 to April 2022

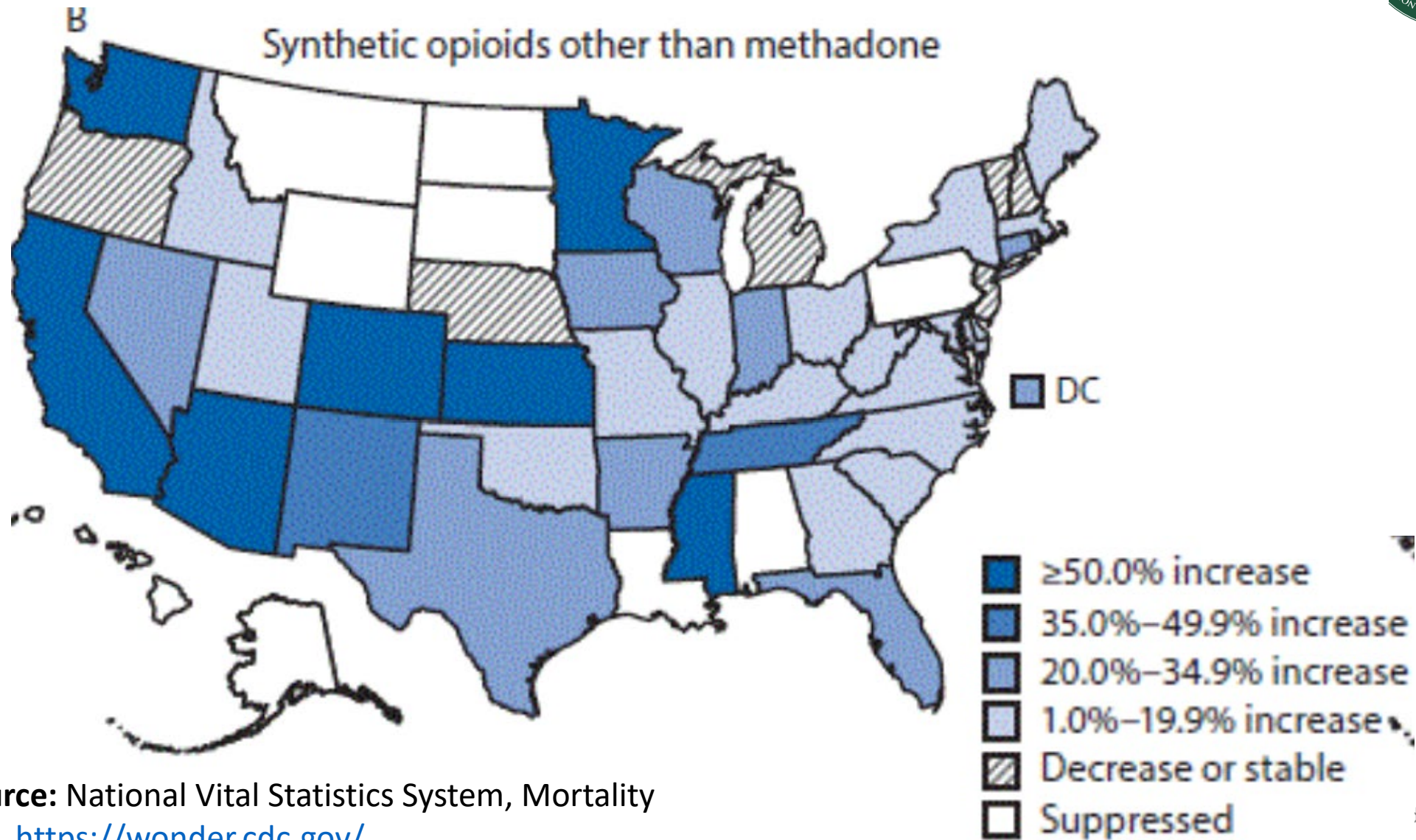


# Percentage of drug overdose deaths involving synthetic opioids other than methadone, 2018–2019



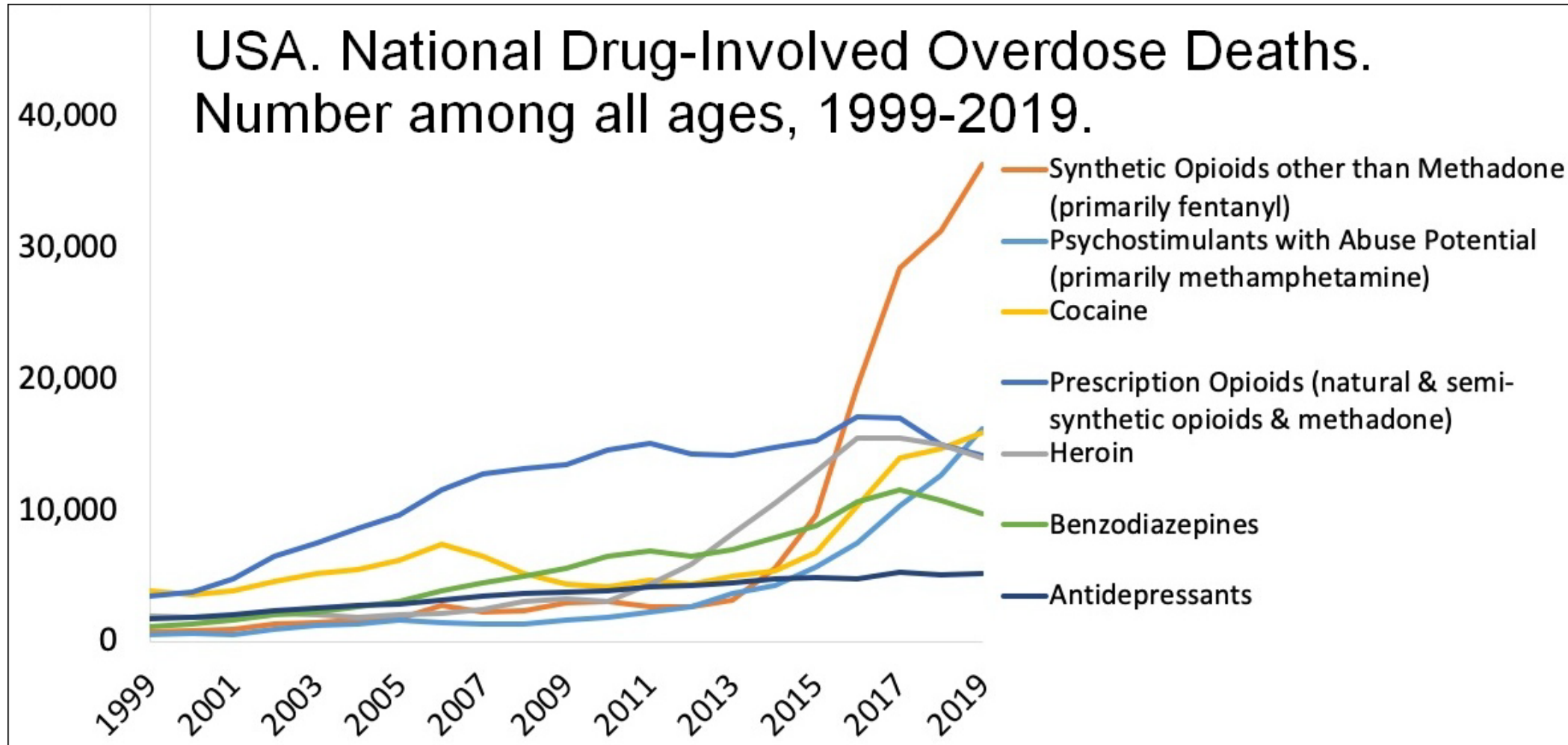
**Source:** National Vital Statistics System, Mortality  
File. <https://wonder.cdc.gov/>

# Relative change in age-adjusted rates of drug overdose deaths involving synthetic opioids other than methadone, 2018–2019



**Source:** National Vital Statistics System, Mortality  
File. <https://wonder.cdc.gov/>

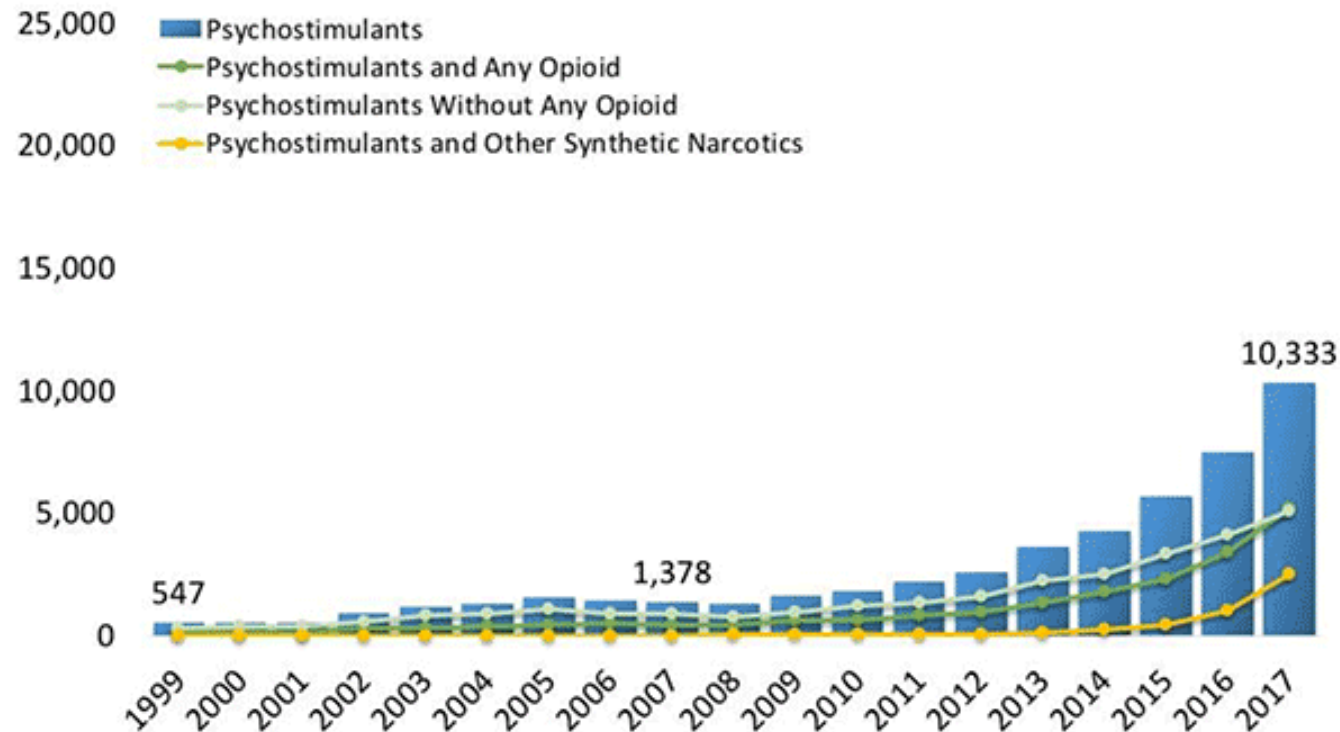




# Stimulant Overdoses



Figure 6. National Drug Overdose Deaths Involving Psychostimulants With Abuse Potential (Including Methamphetamine), by Opioid Involvement Number Among All Ages, 1999-2017



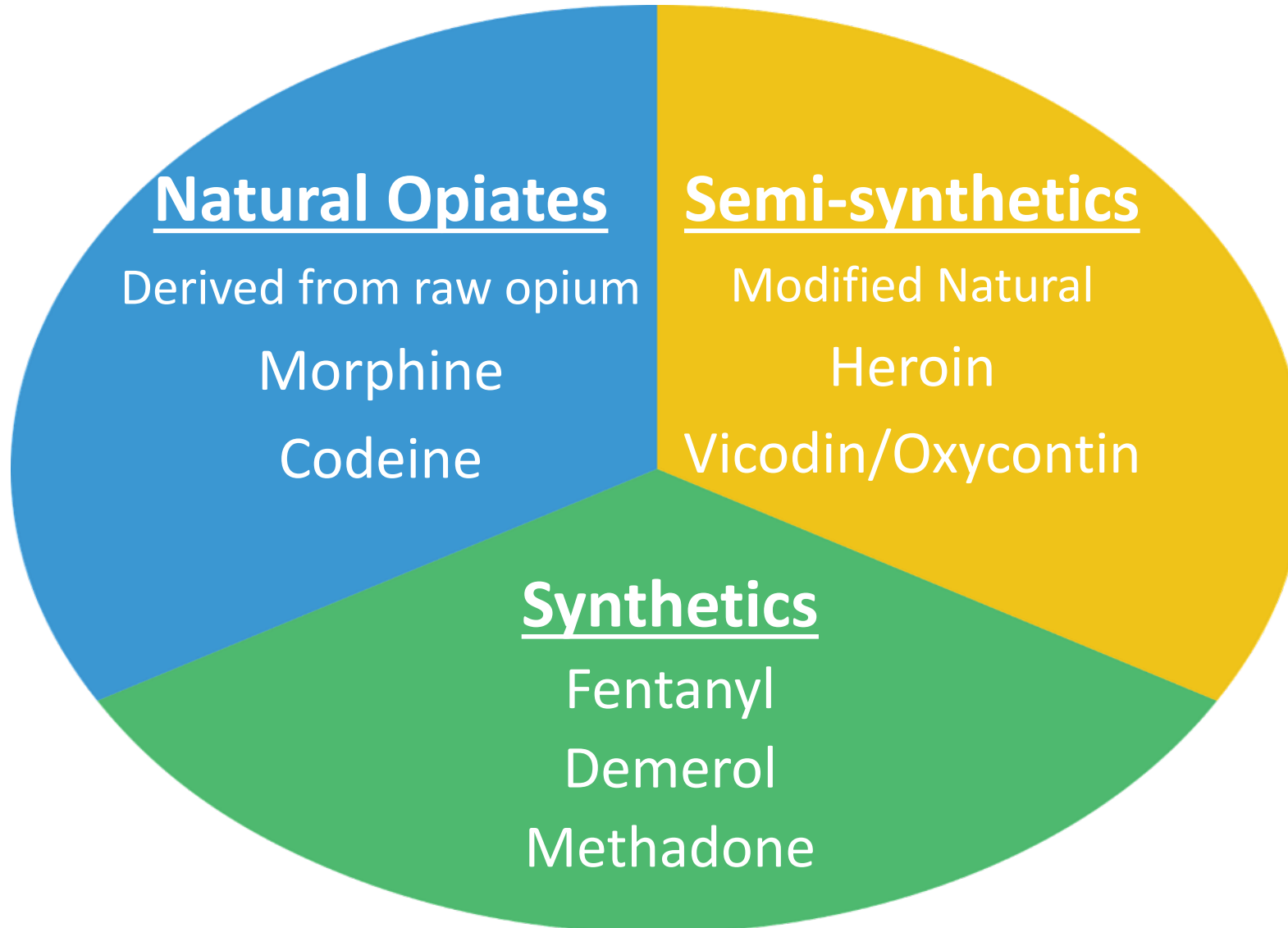
Source: : Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2017 on CDC WONDER Online Database, released December, 2018

# Opioids



- Class of pain-relieving drugs
- Opiates – Come from Opium
  - Natural Opiates - morphine and codeine
  - Semi-synthetic – modified natural opiates – Heroin, Oxycontin, Vicodin
- Other opioids not based on natural opioids – Demerol, Fentanyl, Carfentanil – can be very potent
- Tolerance can develop/disappear quickly
- Withdrawal symptoms are significant

# Opioids





# BAYER

## PHARMACEUTICAL PRODUCTS.

We are now sending to Physicians throughout the United States literature and samples of

# ASPIRIN

The substitute for the Salicylates, agreeable of taste, free from unpleasant after-effects.

# HEROIN

The Sedative for Coughs,

## HEROIN HYDROCHLORIDE

Its water-soluble salt.

You will have call for them. Order a supply from your jobber.

Write for literature to

## FARBENFABRIKEN OF ELBERFELD CO.

40 Stone Street, New York,

SOLE AGENTS

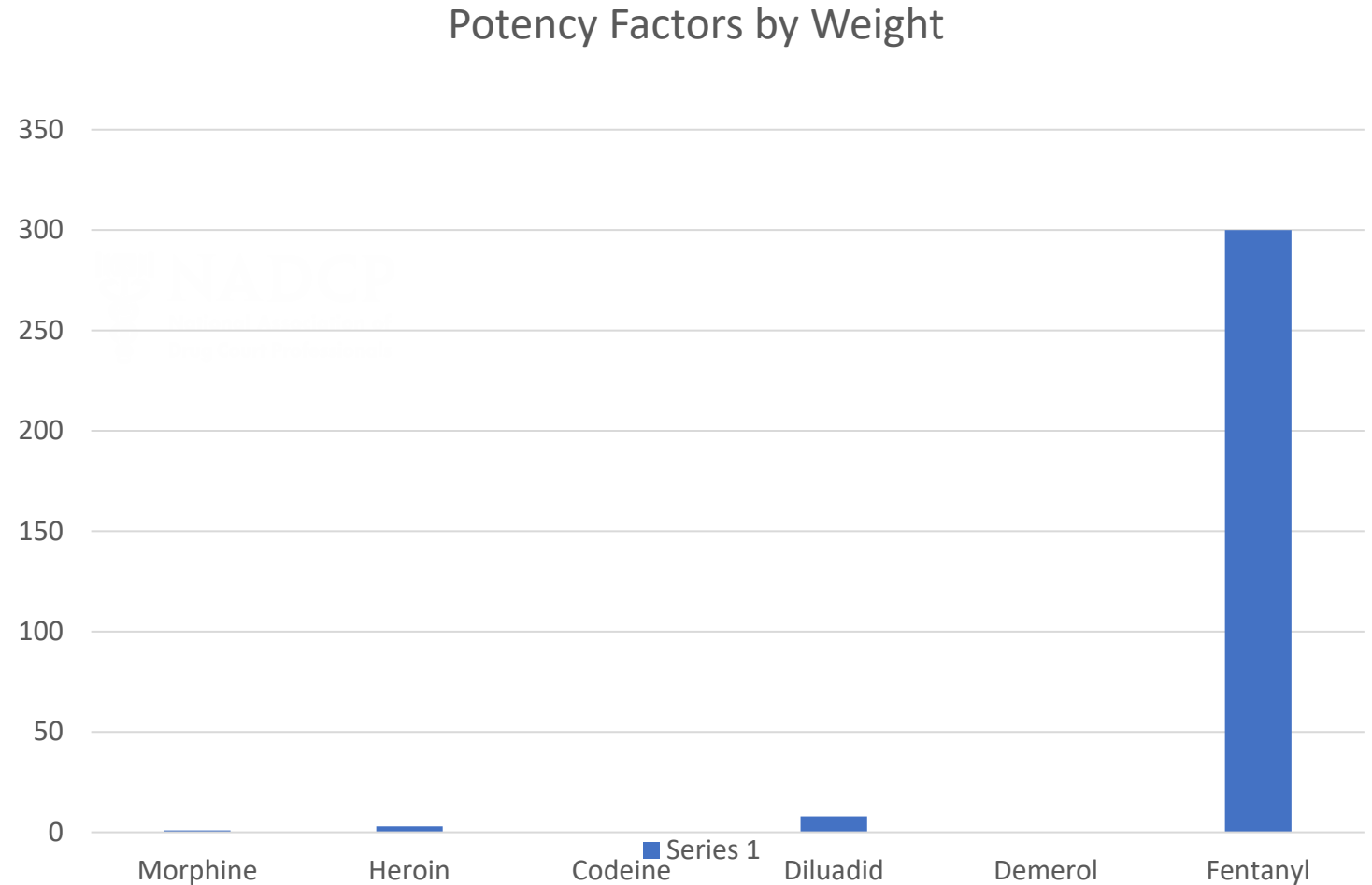




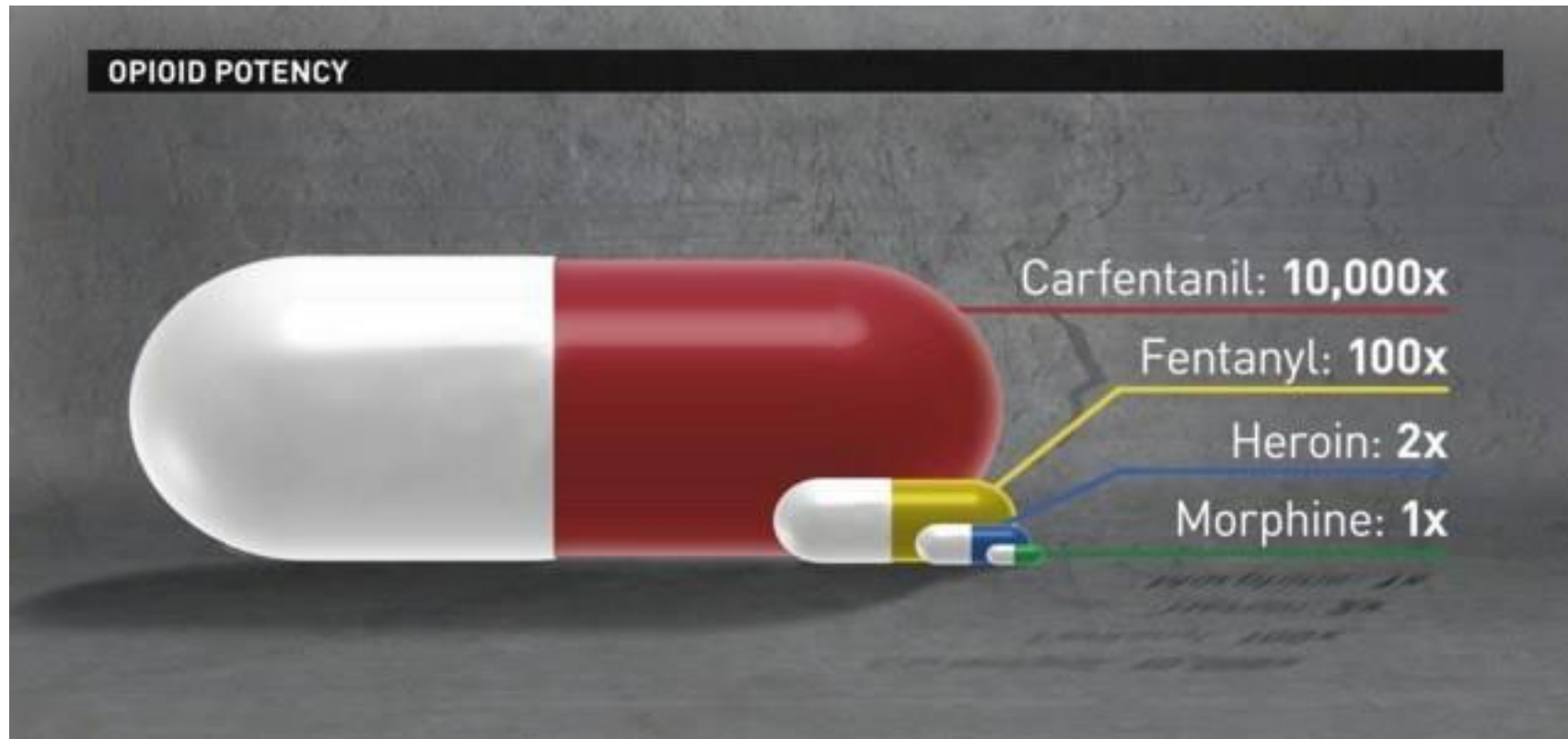
# Potency Factors by Weight



Morphine 1  
Heroin 3  
Codeine 0.1  
Dilaudid 8  
Demerol 0.05  
Fentanyl 300 - 1000



# Potency

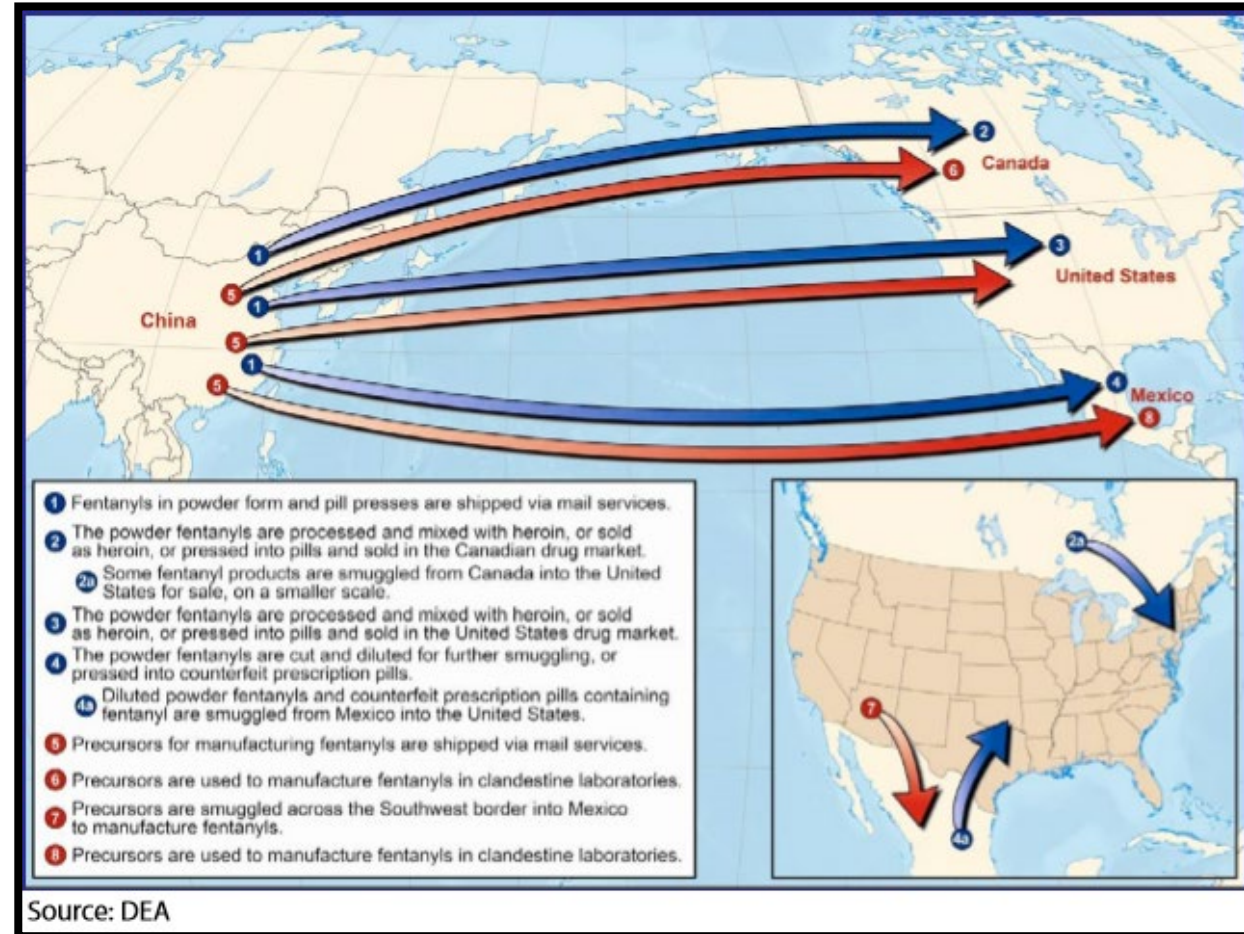


# Fentanyl



## Two primary production areas:

- China supplies precursor chemicals and finished product
- Mexico manufacturing fentanyl in clandestine labs



# It's All About the Money



Drug	Cost per 1 KG to DTO	Wholesale Price per KG in Philadelphia	Revenue to DTO from 1 KG Packaged for Street Sale
Heroin	\$5,000-7,000	\$65,000	\$500,000 (50,000 bags)
Fentanyl	\$3,300-5,000	\$65,000	\$5 million (500,000 bags)

# Fentanyl



## Who brings it, how does it get here, how is it packaged, how is it sold?

- Mexican TCOs – traditional routes and methods
- Mixed at street/mill level, not wholesale



Wholesale heroin and fentanyl seizure (packaged/marked separately).  
Tied to CJNG.



# Fentanyl



- Fentanyl purities
  - Nationwide purity of MX produced fentanyl averages 7%
  - 7% pure fentanyl is the equivalent of 300% pure heroin
- Increase in openly acknowledged sales of fentanyl



www.dea.gov  
U.S. Department of Justice  
Drug Enforcement Administration  
Special Testing and Research Laboratory

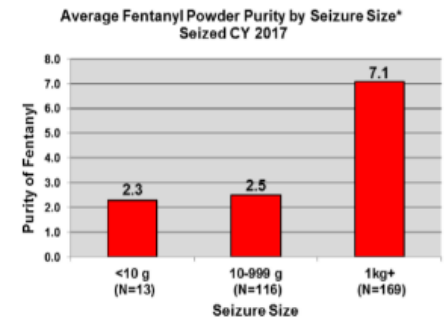


January 2018

## Fentanyl Signature Profiling Program Report

This past year, through the Fentanyl Signature Profiling Program (FSPP), in-depth chemical analyses were performed on fentanyl and fentanyl-related exhibits obtained from seizures made throughout the United States. Analytical methodologies developed at the Special Testing and Research Laboratory (SFL1) through *Operation Death Dragon*, give in-depth reporting on seizures and also link seizures for intelligence purposes. This report details the results and conclusions derived from these analyses which are reported on a quarterly basis. FSPP data is not intended to reflect U.S. market share, but is rather a snapshot of current trends. Data is reported for all seizures examined that were seized within one calendar year of this report.

For this reporting period 386 fentanyl and



\*Seizures of very high purity fentanyl suspected as direct imports from China not included.

The following table summarizes the number of samples, total kg seized, and purity by state.



Source: DEA

# It's all about the Money



- Approximately 500,000 counterfeit pills can be manufactured from one kilogram of fentanyl (2 mgs per pill)
- Retail prices between \$10 and \$20 per pill
- Potential revenue \$5 million on one kilogram



# Fentanyl



## What is being done to address fentanyl production?

- Identification and investigation of overseas heroin/fentanyl suppliers
- Identification and targeting of regional re-suppliers of fentanyl/fentanyl related substances
- Identification and dismantlement of Mexican fentanyl labs
- Control of precursor chemicals
- Coordination with foreign counterparts in dismantling darkweb marketplaces
- Scheduling of all fentanyl-related substances in late 2017





 U.S. DEPARTMENT of JUSTICE

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A-Z INDEX

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# DEA

UNITED STATES

## Drug Enforcement Administration

TOUGH WORK, VITAL MISSION

HOMEABOUTCAREERSOPERATIONS  
DRUG INFOPREVENTIONPRESS ROOMESPAÑOL

### Tough Work, Vital Mission


#### The Facts About DEA



#### DEA 360 Strategy



#### DEA Special Agent Job Announcement



#### DEA Warns Public of Extortion Scams




#### RESOURCE CENTER

- [Controlled Substances Act](#)
- [DEA Museum and Visitors Center](#)
- [Doing Business with DEA](#)
- [Drug Disposal](#)
- [Employee Assistance Program](#)
- [For Victims of Crime](#)
- [Freedom of Information Act \(FOIA\)](#)
- [How do I...?](#)
- [National Clandestine Laboratory Register](#)
- [Registration for Practitioners](#)
- [Statistics & Facts](#)

#### STAY CONNECTED

 EMAIL UPDATES



 Report Synthetic Drug Source

#### SUBMIT A TIP



#### DEA NEWS

##### Irish man who helped run the "Silk Road" website extradited

**JUL 13 (NEW YORK)**

Geoffrey S. Berman, the United States Attorney for the Southern District of New York, announced today that Gary Davis, a/k/a "Libertas," was extradited from the Republic of Ireland to the United States.

[READ MORE](#) | [MORE DEA NEWS](#)

#### TOPICS OF INTEREST


- 15th National Prescription Drug Take Back Day Results
- DEA Warns of Extortion Scams
- Directive Regarding the Presence of Cannabinoids and Materials Made from the Cannabis Plant
- Counterfeit Prescription Pills Containing Fentanyl: A Global Threat
- Public Drug Disposal: Search for an Authorized Drug Disposal Location


#### NEWS RELEASES

- JULY 13** (NEWARK, N.J.) Long-time leader of Grape Street Crips Gang, two others convicted of racketeering conspiracy, murders, drug trafficking
- JULY 13** (ROME, Ga) Career Offender Sentenced to 20 Years for Drug Offense
- JULY 13** (Buffalo, N.Y.) DEA undercover operation leads to guilty plea
- JULY 13** (Buffalo, N.Y.) Jury convicts Jamestown man of cocaine conspiracy
- JULY 12** (Sacramento, Calif) Bay area methamphetamine trafficker sentenced years

[MORE NEWS RELEASES](#)

#### MOST WANTED FUGITIVES





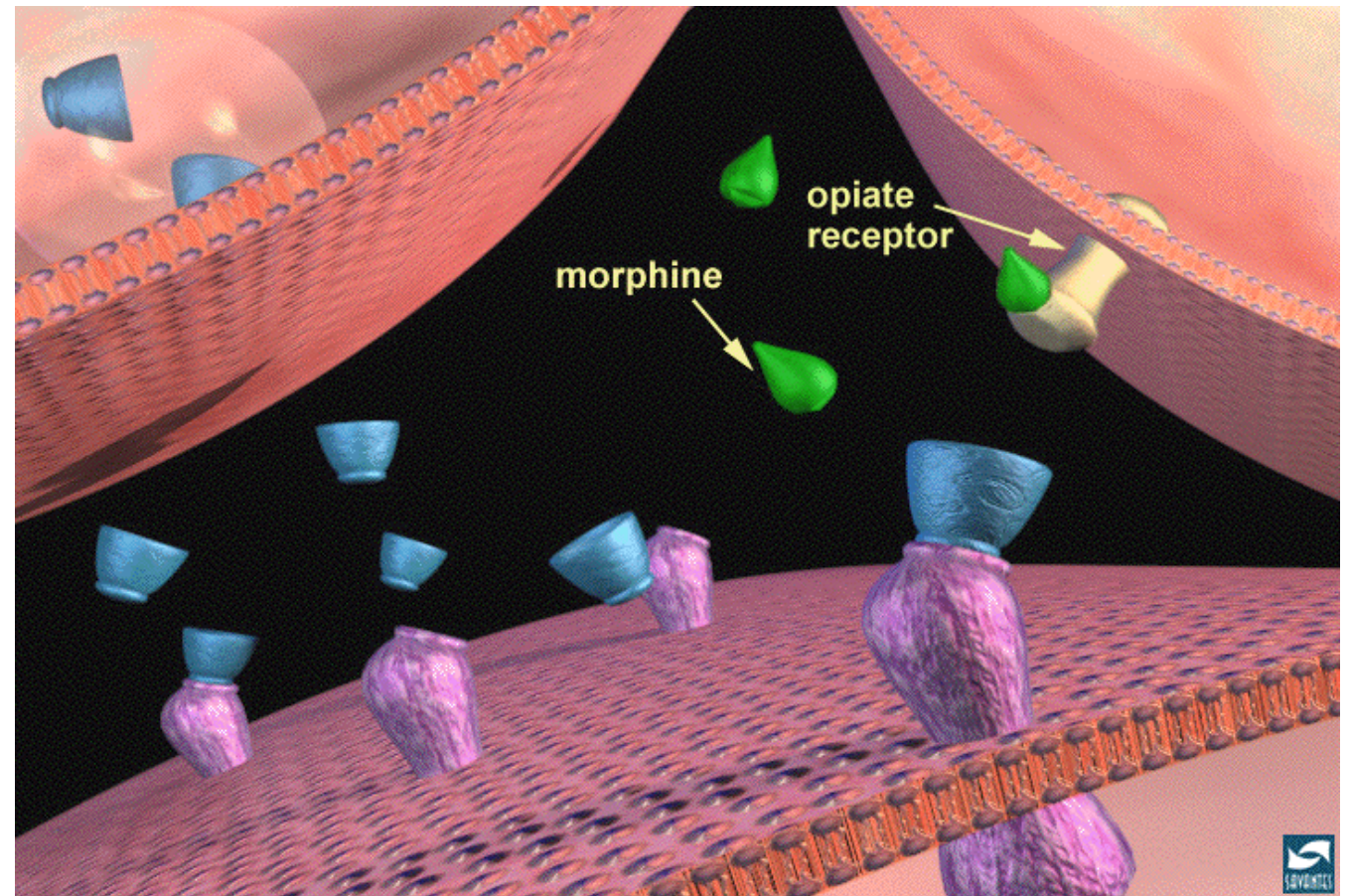


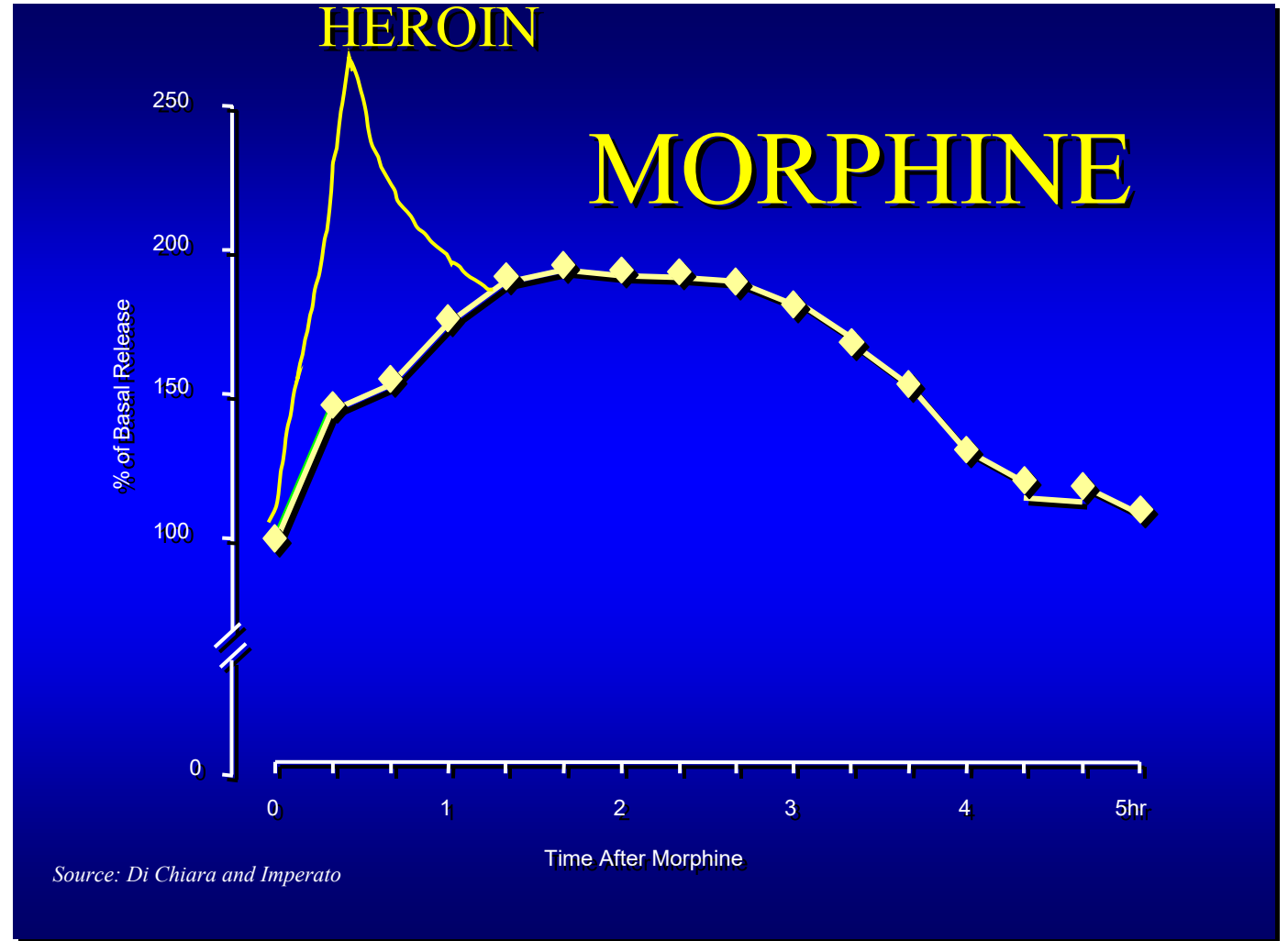
# Opiates & Reward Pathway





# Opiates Increase DA Release

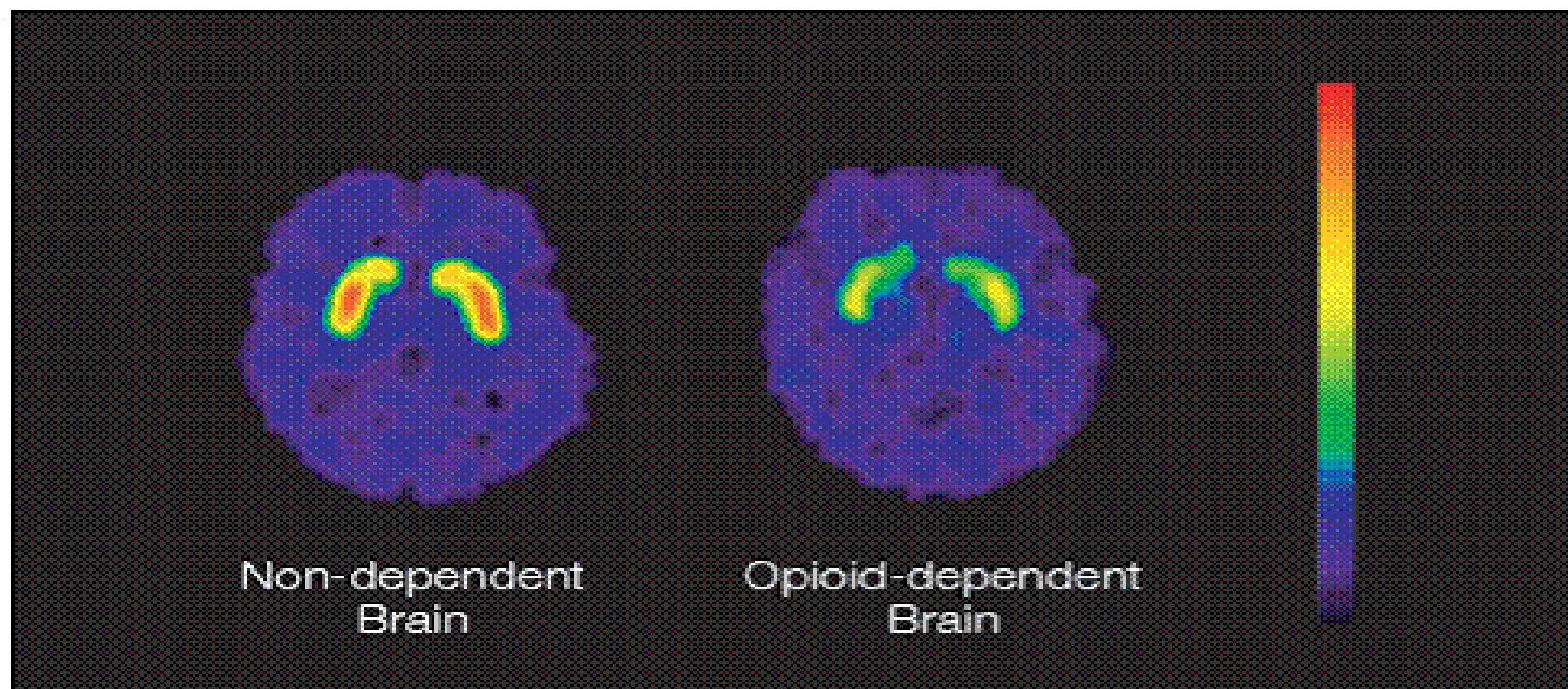




# This is Your Brain on Drugs



## Non-Opioid-Dependent and Opioid-Dependent Brain Images



PET scan images show changes in brain function caused by opioid dependence. The lack of red in the opioid-dependent brain shows a reduction in brain function in these regions.

Reprinted by permission of Nature Publishing Group: *Neuropsychopharmacology*. 1997;16:174-182.



# Opioid



## Effects

- Analgesia - change in pain perception
- Euphoria - Intense
- Sedation - “on the nod”
- Respiratory Depression
- Cough Suppression
- Nausea/vomiting
- Constipation

## Withdrawal

- Pain
- Depression
- Alert
- Rapid Breathing
- Coughing
- Nausea/Vomiting
- Diarrhea
- 3-5 days

# Opioid Usage Patterns



- Highly addictive and dependence producing
- Significant tolerance up to 35X
- Increased cost
- Tolerance management (Tx, jail, etc.)
- Mixing with other opiates and other drugs (speedballing/cocaine)
- Risk of other infections – HIV, Hep C, etc.

# Fentanyl



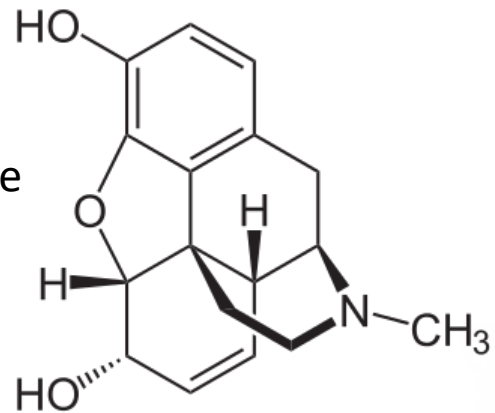
- Synthetic Opiate
- Very powerful formulas
- Extensive Medical Use
- Sold as heroin, opioid pills, cocaine, etc.
- High overdose risk



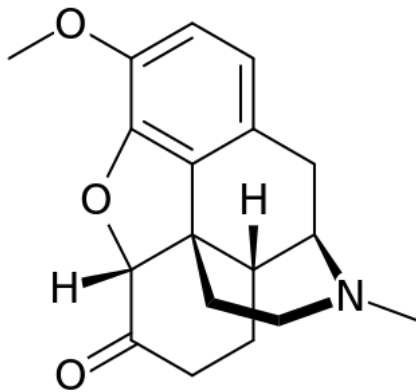
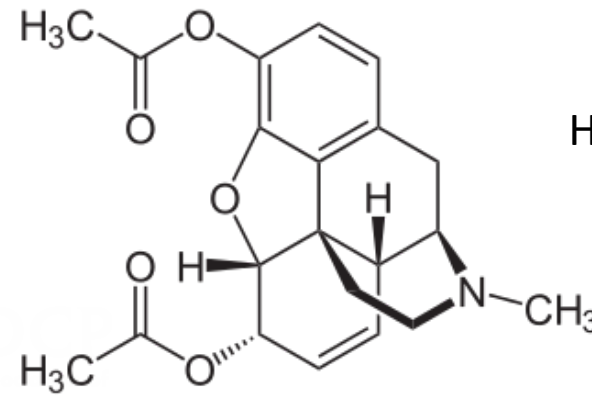
# Drug Structures



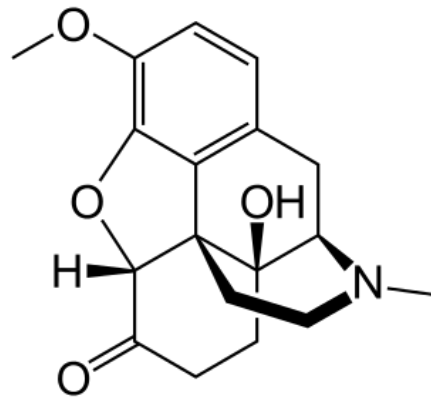
Morphine



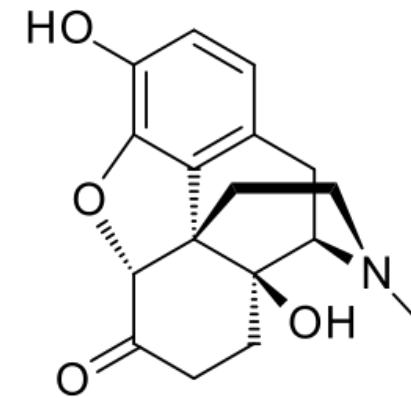
Heroin



Hydrocodone/Vicodin/  
Hysingla ER

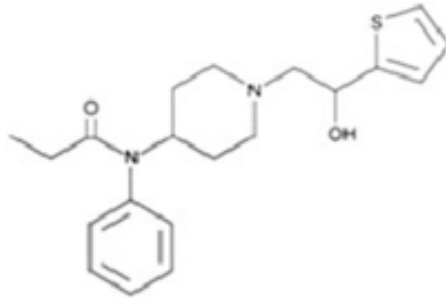


Oxycodone/Oxycontin

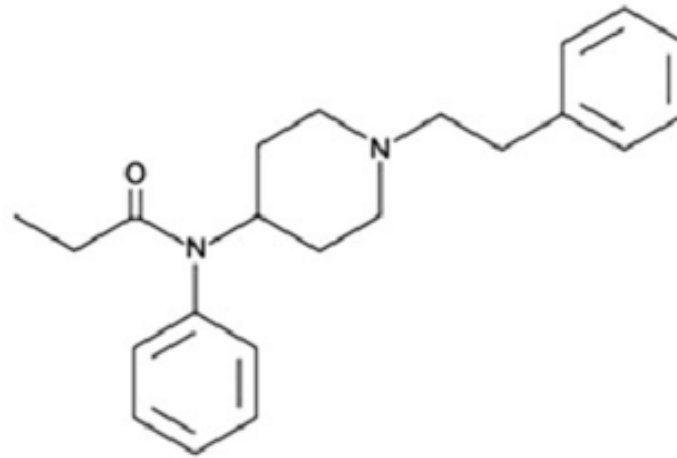


Oxymorphone/Opana

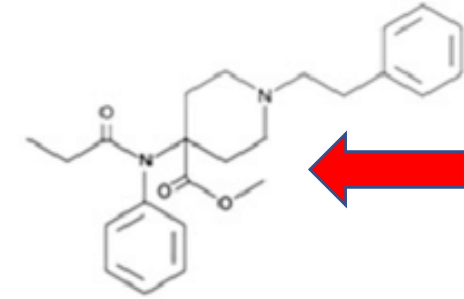
# Drug Structures



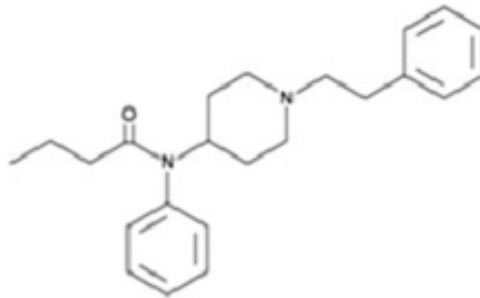
$\beta$ -Hydroxythiofentanyl



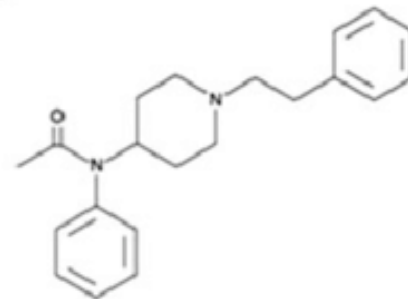
Fentanyl



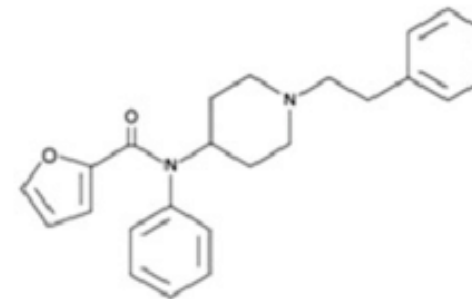
Carfentanil



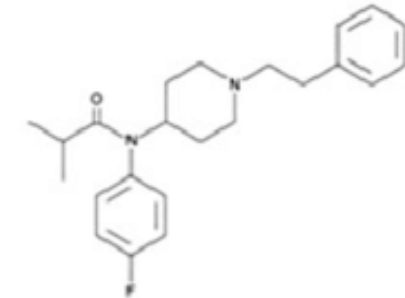
Butyryl Fentanyl



Acetyl Fentanyl



Furanyl Fentanyl



para-Fluoroisobutyryl Fentanyl



# Overdose amount



# Treating Overdose



- Naloxone is a medicine that can treat a fentanyl overdose when given right away. It works by rapidly binding to opioid receptors and blocking the effects of opioid drugs.
- But fentanyl is stronger than other opioid drugs like morphine and might require multiple doses of naloxone.

# Testing for Fentanyl

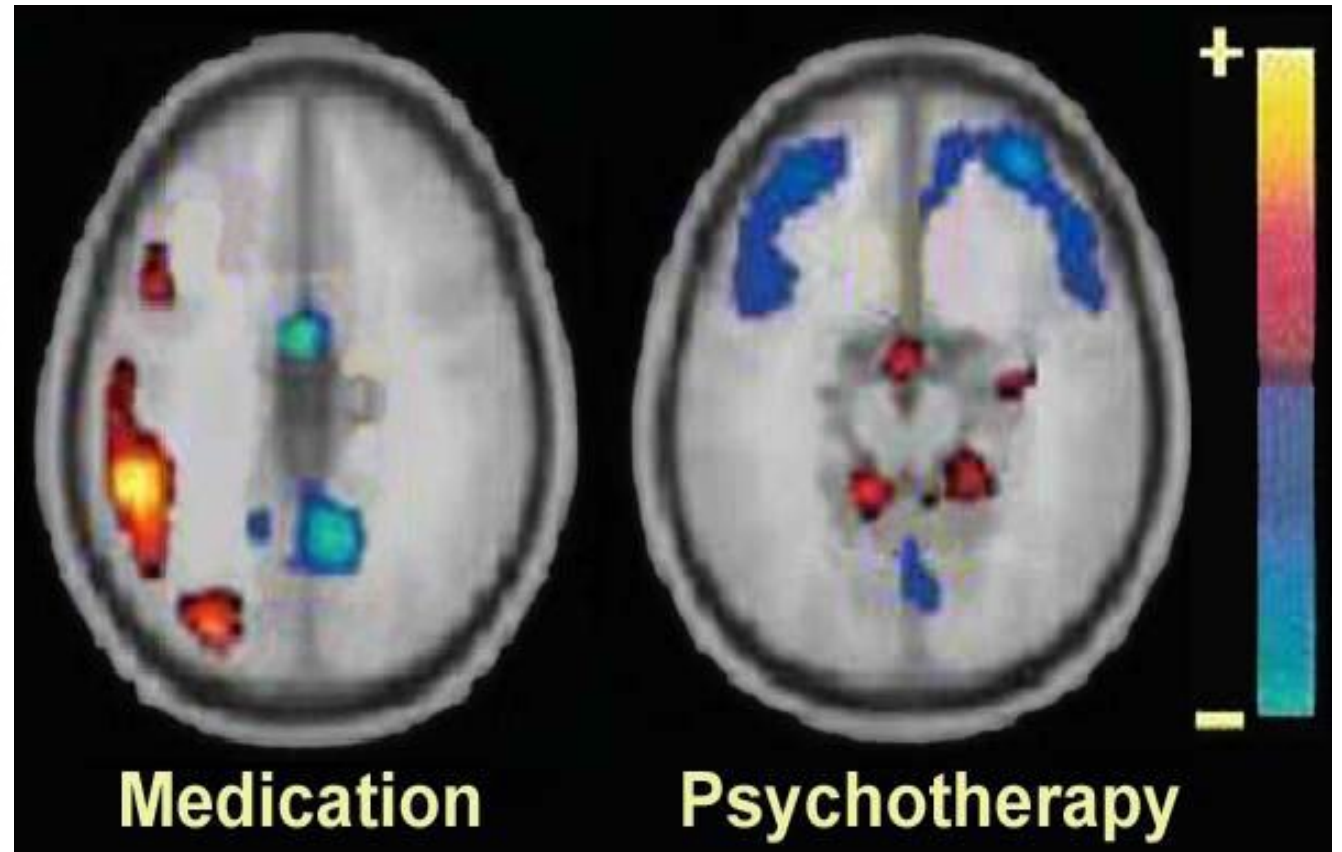


- Make sure that the laboratory or testing cups specifically test for fentanyl variations. Regular opioid screens may not catch it.
- Make sure that lab doesn't only test for "medical" fentanyl and Norfentanyl (metabolite). This would miss illicit variations.
- Detectable for 2-3 days after use.

# Does Treatment Work?



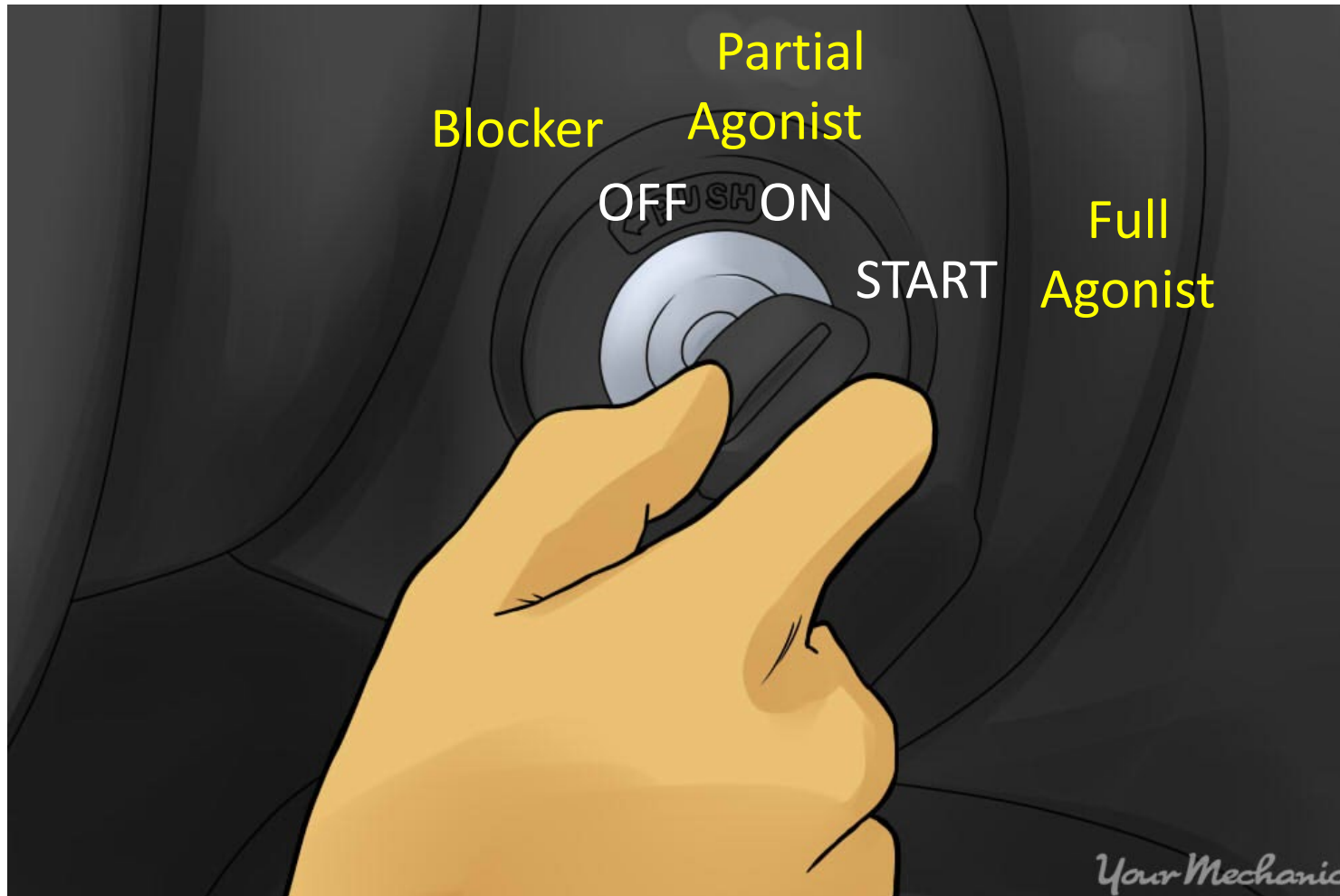
- Medications + psychosocial therapy *both* benefit brain function and recovery.
- Each affects different parts of brain and in opposite ways.



PET scans adapted and retouched from Goldapple et al. 2004

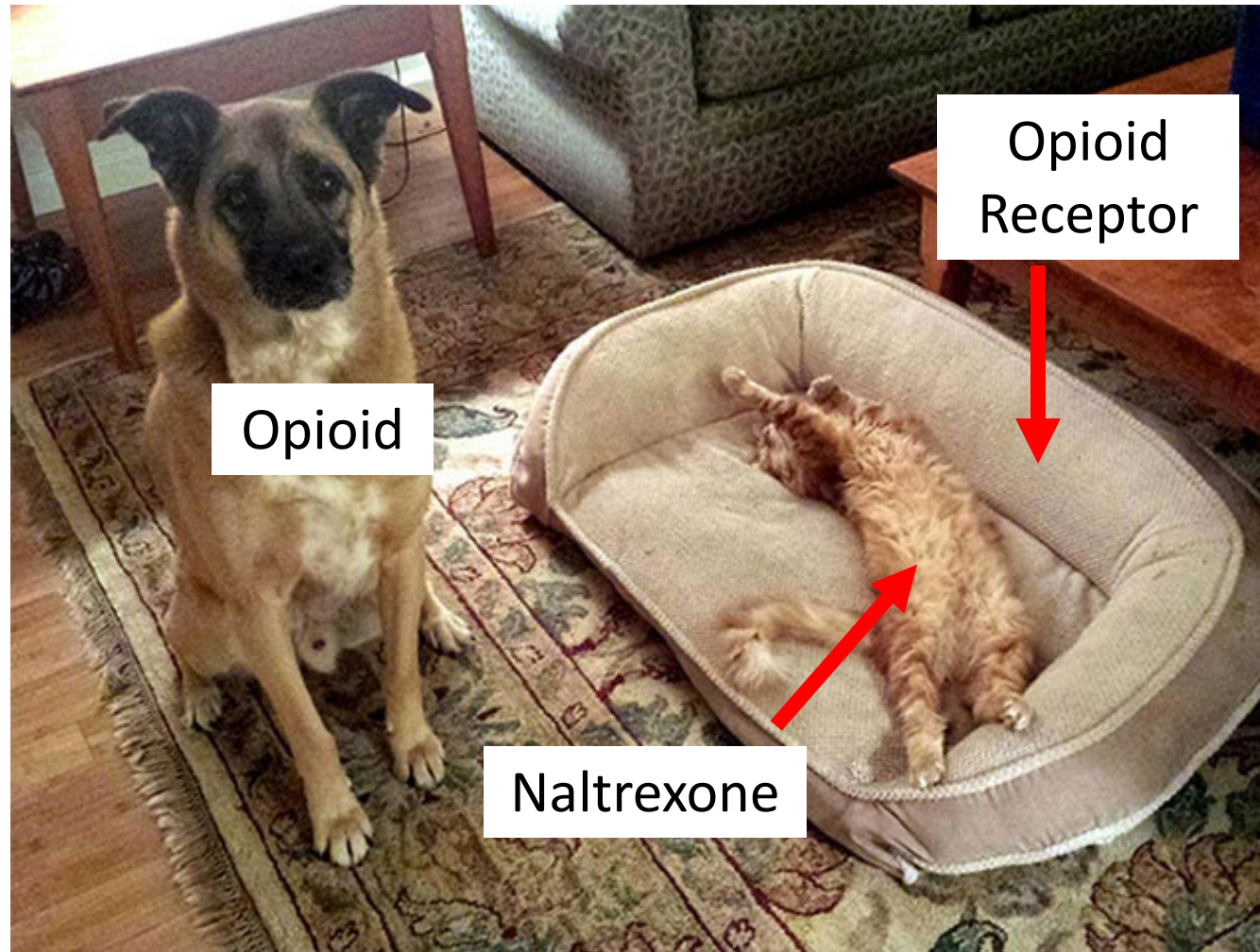


# Agonists and Blockers

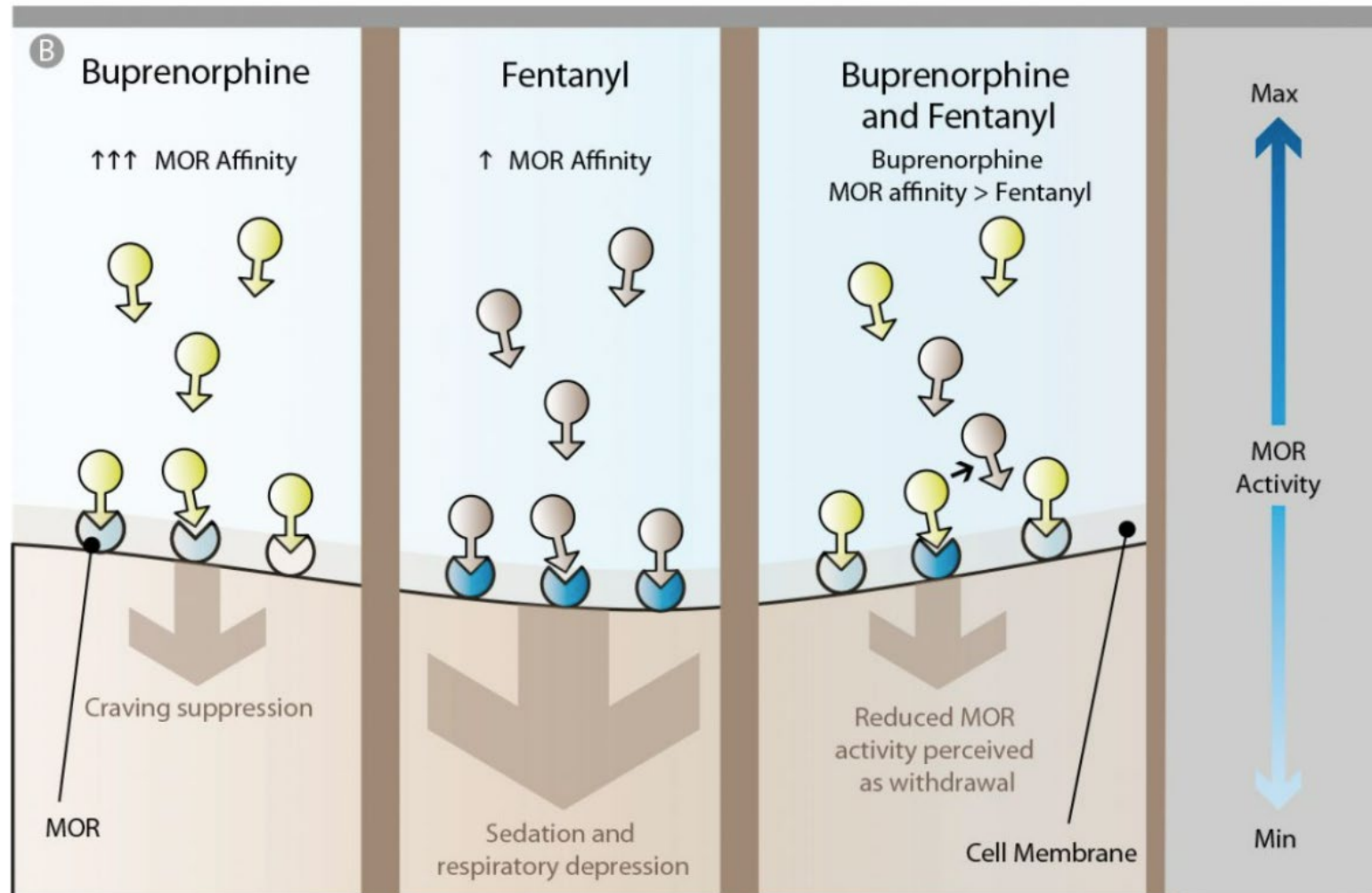




# Antagonist Action



# Buprenorphine and Fentanyl



## **Several Names**

MAT – Medication Assisted Treatment

MAT – Medication for Addiction Treatment

MOUD – Medication for Opioid Use Disorder

# Medications



**Can reduce cravings**

**Can enhance engagement in treatment**

**Can reduce use of other substances**

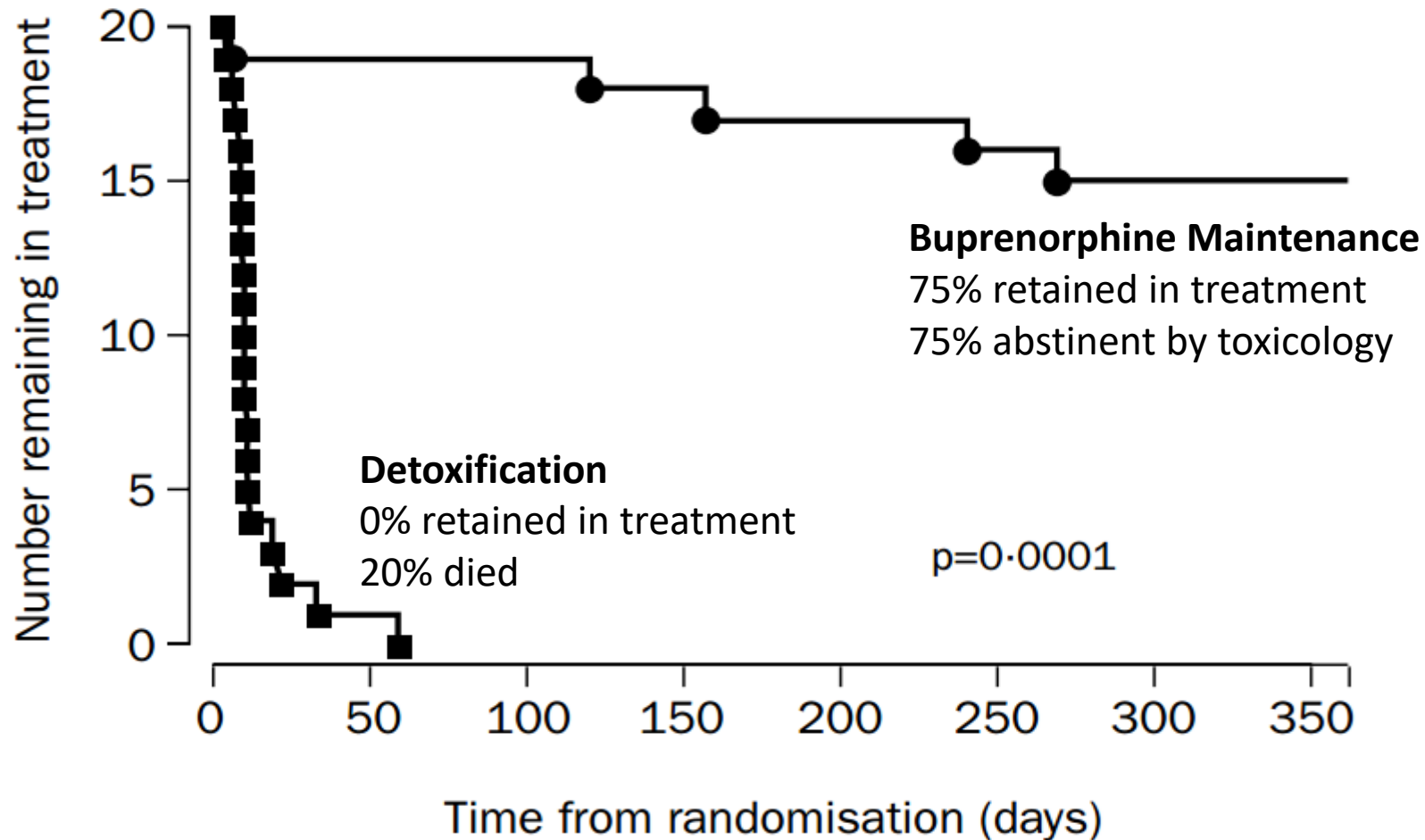
**Can increase contact with professional care givers**

**Reduces crime**

**Can save lives!**



# Buprenorphine Research



Kakko et al. Lancet. 2003 Feb  
22;361(9358):662-8

# Mortality



	Placebo	BPN
Dead	4/20 (20%)	0/20 (0%)

Heilig, Lancet 2003

# MAT – THE STANDARD OF CARE FOR OUD



**ASAM** American Society of  
Addiction Medicine



- American Medical Association - AMA
- American Society of Addiction Medicine –ASAM
- American Association of Addiction Psychiatry – AAAP
- Etc., Etc., Etc...



It is the FIRST Level Standard of Care, not the last resort.



# Counseling Component



- Important for addressing trauma, mental health issues, triggers and cravings
- Many people use more than one substance
- However, do not make getting medication dependent on counseling participation



# Alive is Good!

