

# ADDICTION IS A DISEASE, NOT A CHOICE, AND SHOULD BE TREATED AS SUCH



**WORCESTER**  
DEPARTMENT OF  
HEALTH & HUMAN SERVICES

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PATHWAYS FOR CHANGE  
LIVING IN FREEDOM TOGETHER (LIFT)

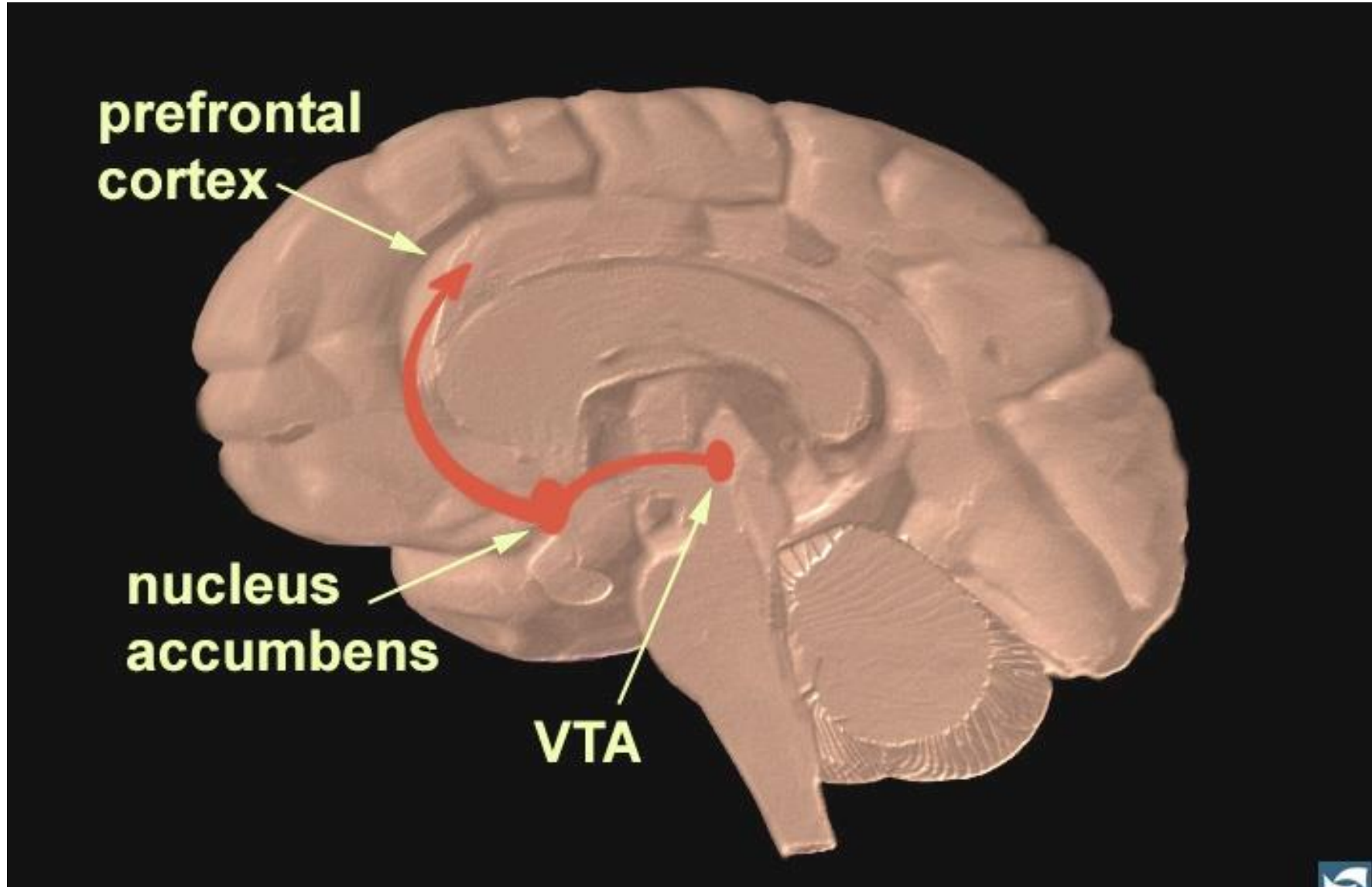


## Michael Eariolo

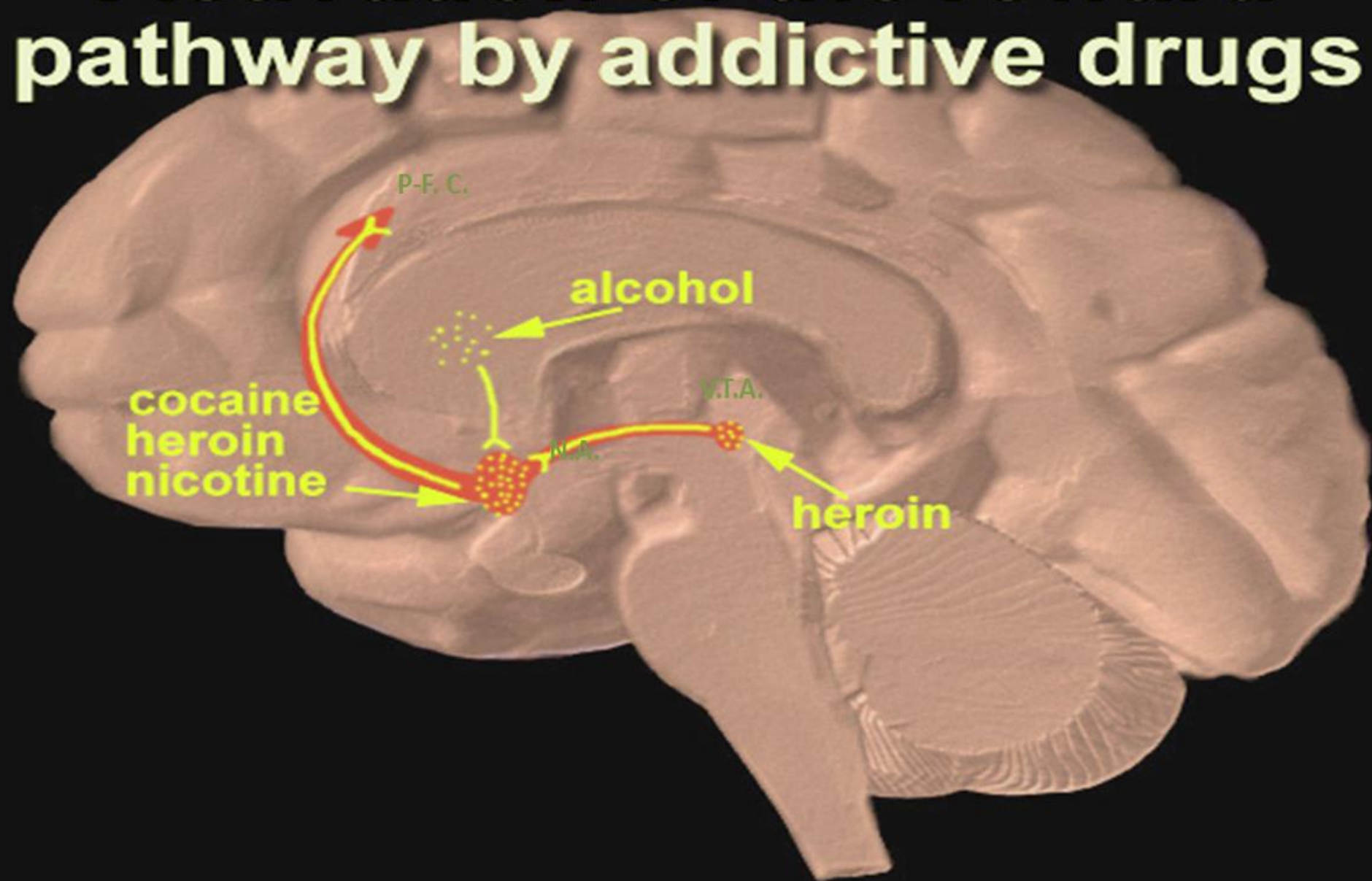
EVERYDAY MIRACLES PEER  
RECOVERY CENTER



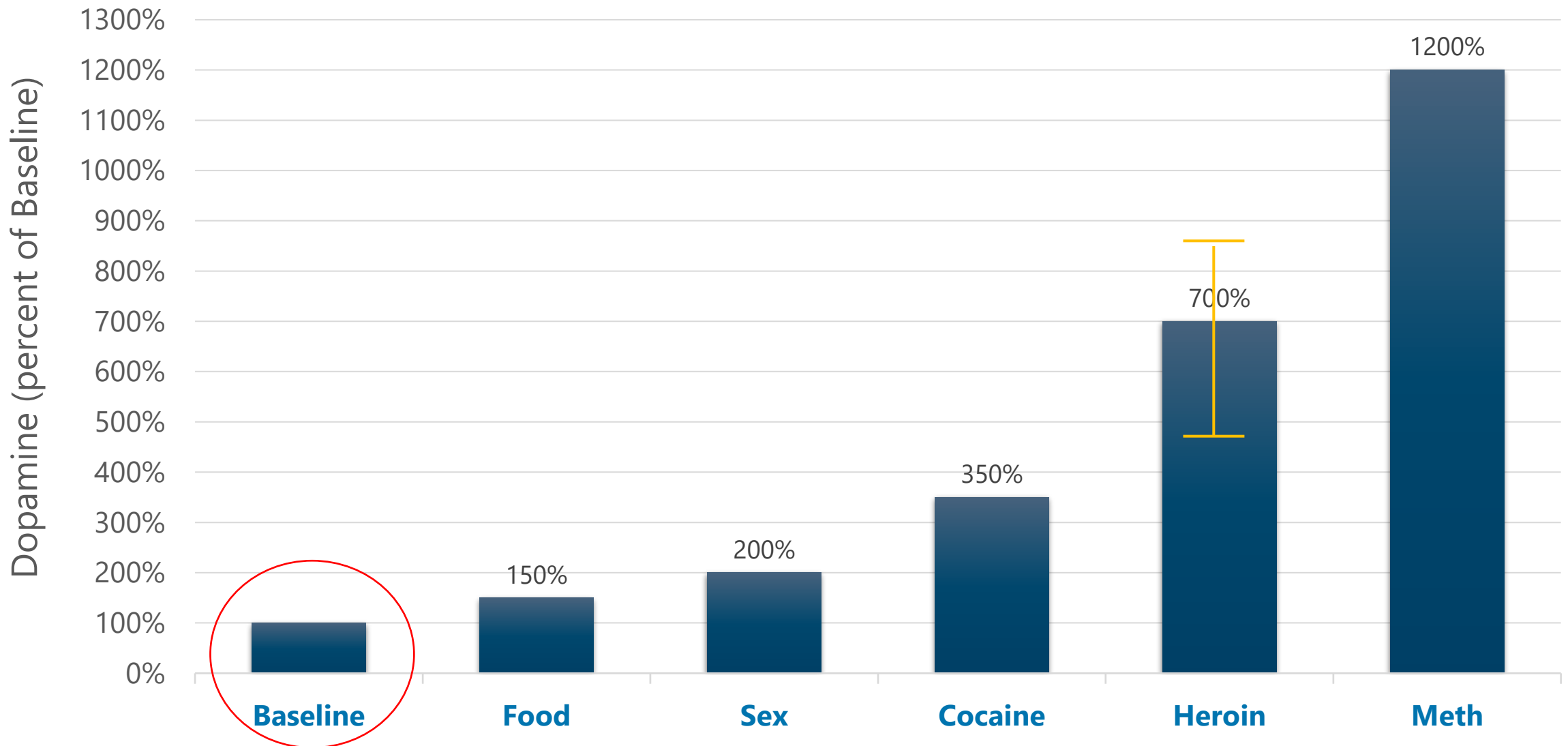
# Reward Pathway: Anatomical Areas



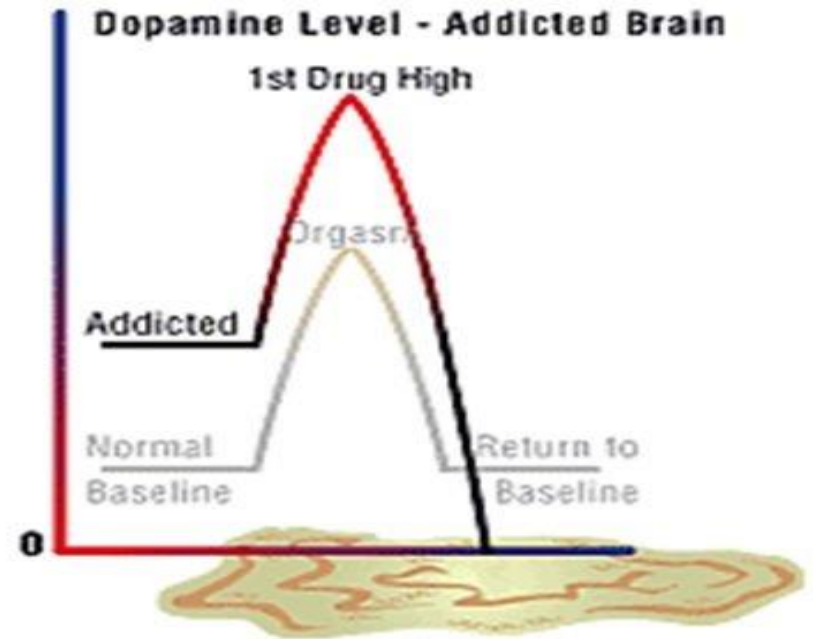
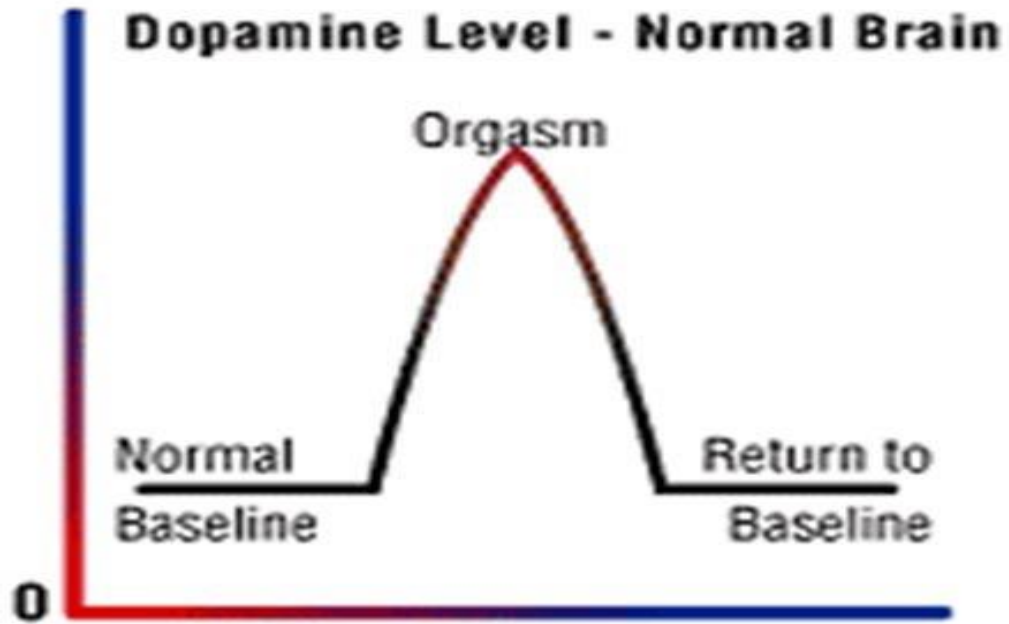
# Activation of the reward pathway by addictive drugs



# Comparative Levels of Dopamine Release



# Differences in Dopamine Levels



# Comparison of FDA-Approved Medications for the Treatment of Opioid Use Disorders

**An evidence-based method that combines counseling, behavioral therapies, and FDA-approved meds**

| Medication    | Mechanism of action at $\mu$ -opioid receptor | Phase of treatment              | Formulations        | Dosages commonly used                                    | Adverse effects  | Regulations/availability   |
|---------------|---|---------------------------------|---------------------|--|--|--|
| Methadone     | Agonist                                       | Detoxification, maintenance     | Oral                | Detoxification: 20 - 40 mg/d, maintenance: 80 - 120 mg/d | Respiratory suppression, sedation, prolonged QTc, constipation, hyperhidrosis, sexual dysfunctions | Only available at designated federally regulated opioid treatment sites        |
| Buprenorphine | Partial agonist                               | Detoxification, maintenance     | Sublingual, buccal  | 2 - 32 mg/d  | Constipation, nausea, precipitated withdrawal  | Requires DATA 2000 waiver + DEA X-number, available for office-based treatment |
| Naltrexone    | Antagonist                                    | Relapse prevention, maintenance | Oral, intramuscular | 25 - 100 mg/d PO, 380 mg/mo IM                           | Nausea, anxiety, insomnia, precipitated withdrawal   | None, office-based treatment   |

Data 2000, Drug Addiction Treatment Act of 2000; DEA, Drug Enforcement Administration.

# How Opioid Use Disorder (OUD) Medications Work in the Brain



Methadone



Full agonist:  
generates effect

Buprenorphine



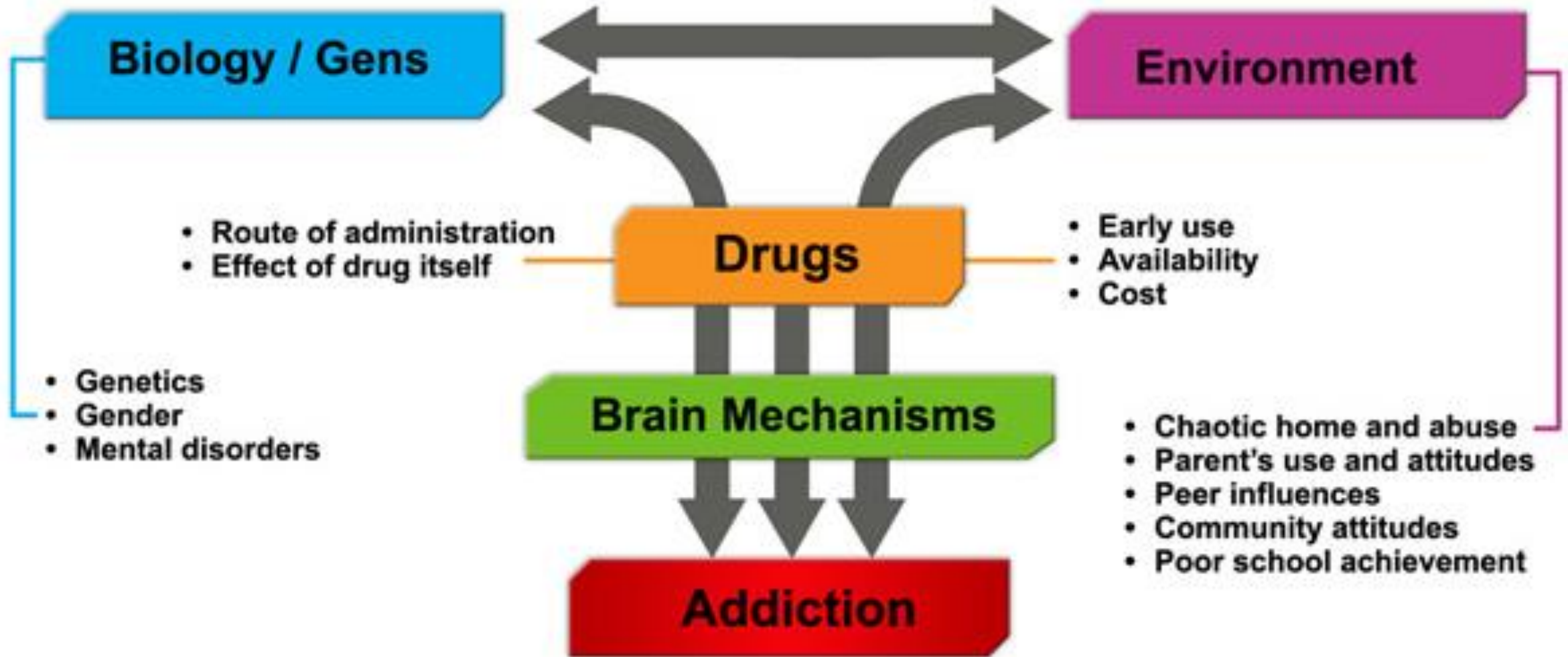
Partial agonist:  
generates limited effect

Naltrexone



Antagonist:  
blocks effect

# Factors Leading and Addiction





# Adverse Childhood Experiences Study (ACES)

Became the largest study ever completed that examined **health and social effects of traumatic childhood experiences over the lifespan**

Participants **N=17,000 mostly white, middle and upper-middle class college-educated San Diegans with good jobs and great health care** – they all belonged to the Kaiser Permanente health maintenance organization

# THREE CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES

## ABUSE



Physical



Emotional



Sexual

## NEGLECT



Physical



Emotional

## HOUSEHOLD DYSFUNCTION



Mental Illness



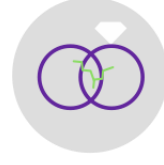
Incarcerated Relative



Mother treated  
violently



Substance Abuse



Divorce

# Adverse Childhood Experiences are Common

Examines **three** general forms of **abuse** and **household dysfunction**.

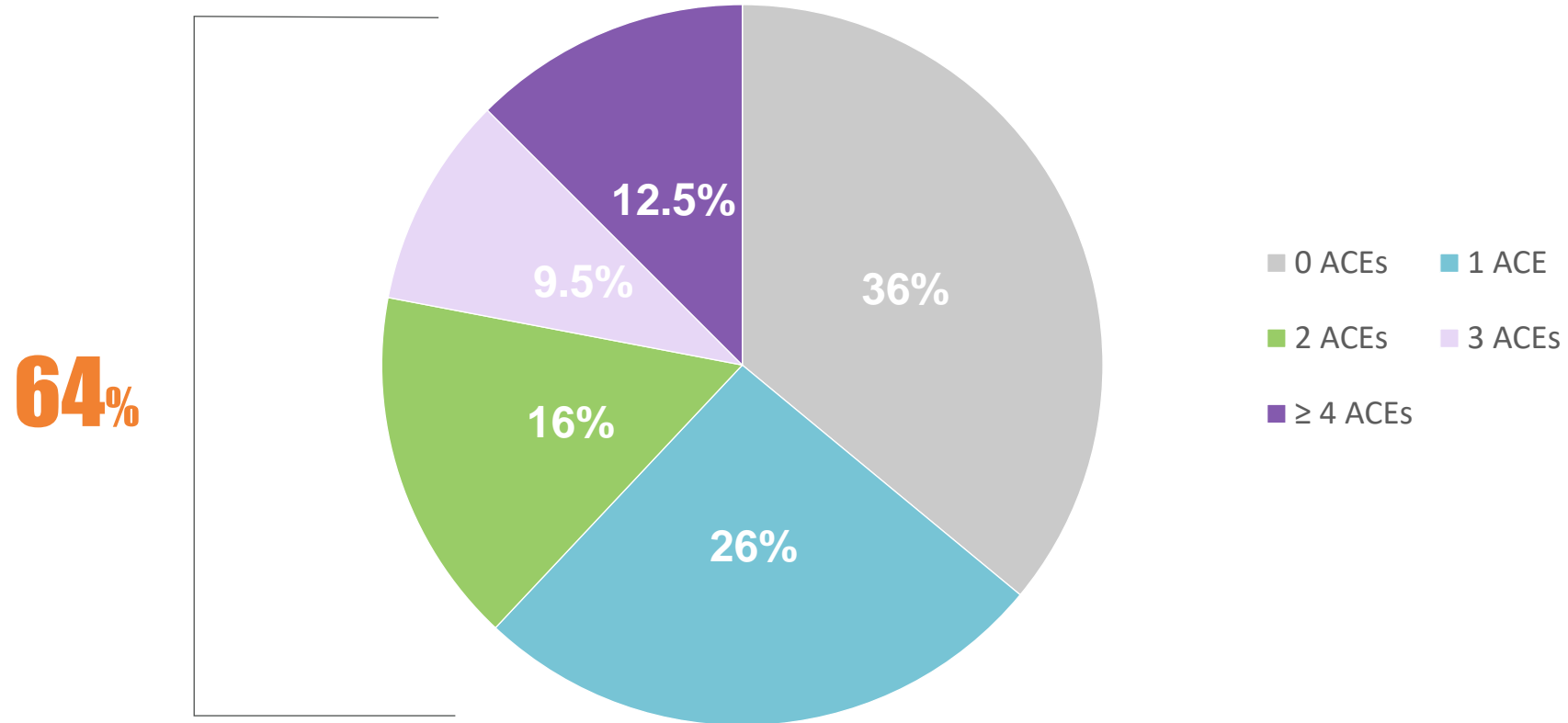
|                               |     |
|-------------------------------|-----|
| <u>Household dysfunction:</u> |     |
| Substance abuse               | 27% |
| Parental sep/divorce          | 23% |
| Mental illness                | 17% |
| Battered mother               | 13% |
| Criminal behavior             | 6%  |
| <u>Abuse:</u>                 |     |
| Psychological                 | 11% |
| Physical                      | 28% |
| Sexual                        | 21% |
| <u>Neglect:</u>               |     |
| Emotional                     | 15% |
| Physical                      | 10% |

# Scoring the ACE

## Example:

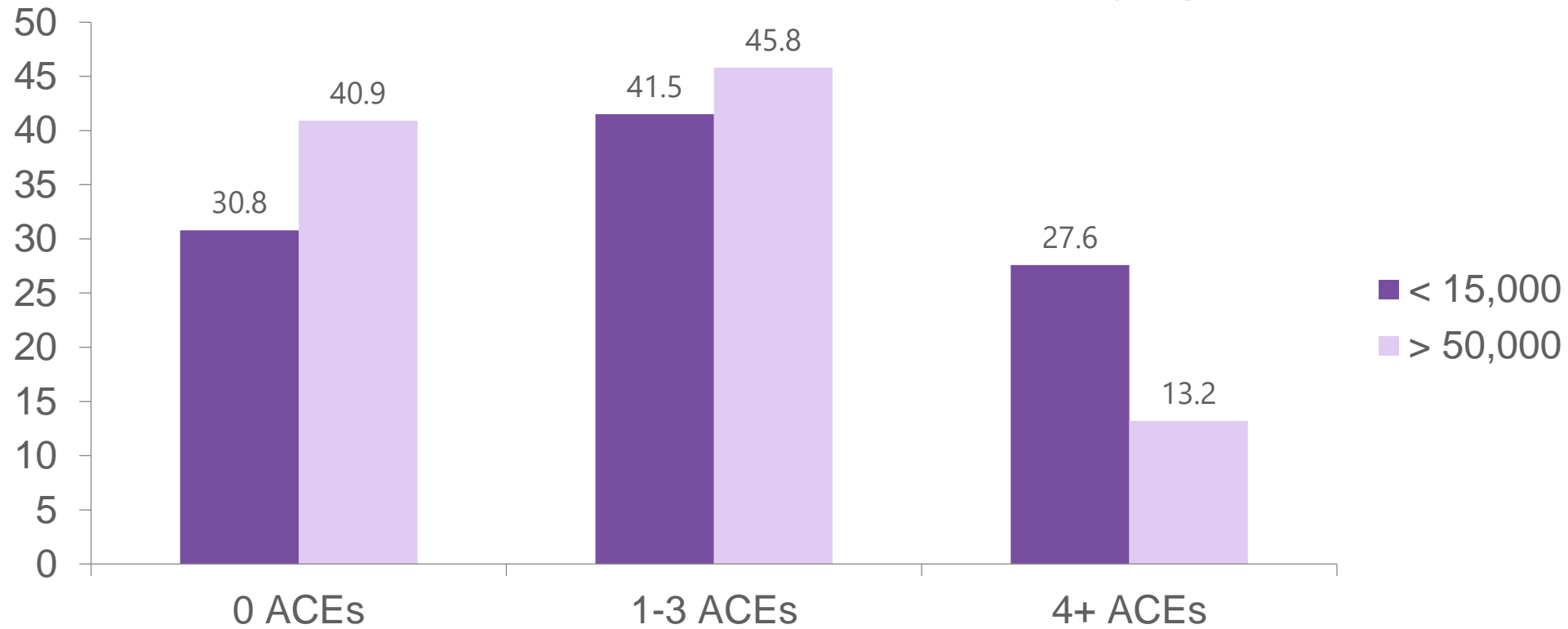
- A male child with an ACE **Score of 6**, when compared to a male child with an ACE Score of 0, **has a 46-fold (4,600%) increase** in the likelihood of becoming an **injection drug user** sometime later in life.
- Likelihood of Future Diseases:
  - Chronic pulmonary lung disease **increases 390 percent**;
  - Hepatitis, 240 percent;
  - Depression 460 percent;
  - Suicide, 1,220 percent.

# Nearly two-thirds of adults have at least one ACE



Source: CDC-Kaiser ACE Study (1998)

Though there is relatively little difference in moderate levels of ACE exposure by income, prevalence of 4+ ACEs in low-income populations is substantially greater



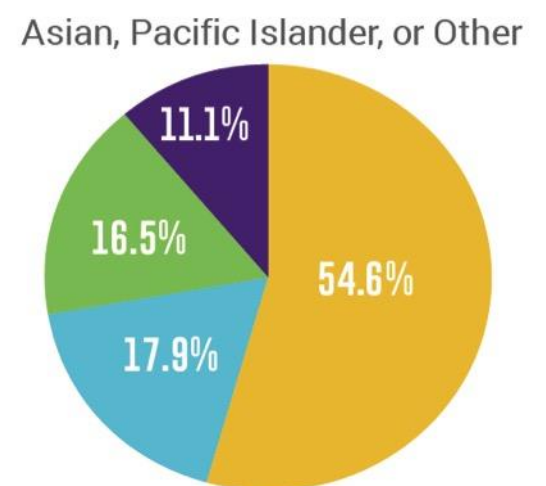
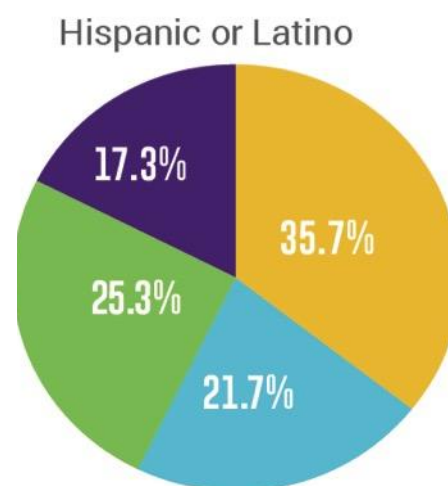
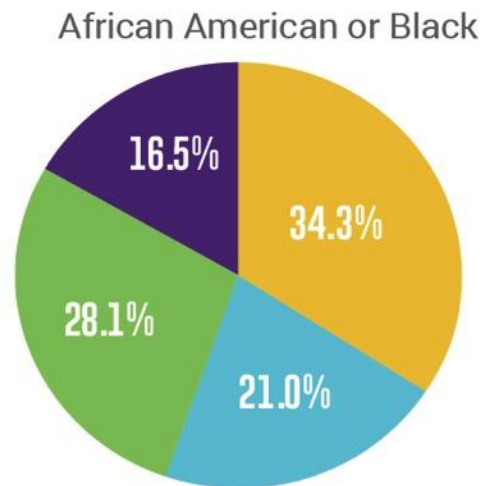
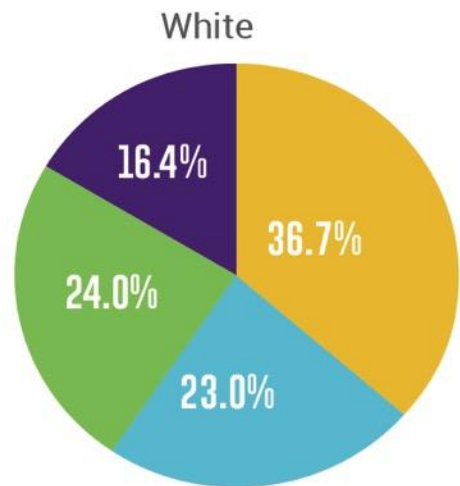
Data source: \*Gilbert et al. 2010 Childhood Adversity and Adult Chronic Disease: An Update from Ten States and the District of Columbia. American Journal of Preventative Medicine. 48(3): 345-349

# ACEs prevalence across the US

| State      | % of adults with > 1 ACE | % of adults with > 4 ACEs |
|------------|--------------------------|---------------------------|
| California | 61.7%                    | 16.7%                     |
| Iowa       | 55%                      | 14%                       |
| Minnesota  | 55%                      | 13%                       |
| Montana    | 61%                      | 17%                       |
| Vermont    | 57%                      | 13%                       |
| Washington | 61.9%                    | 17%                       |
| Wisconsin  | 56%                      | 14%                       |

Source: Childhood Adversity and Adult Chronic Disease  
Gilbert, Leah K. et al. American Journal of Preventive Medicine , Volume 48 , Issue 3 , 345 - 349

# ACEs across race and ethnicity



Source: "A Hidden Crisis: Findings on Adverse Childhood Experiences in California," Center for Youth Wellness and Public Health Institute 2014



# ACEs dramatically increase risk for 7 out of 10 leading causes of death

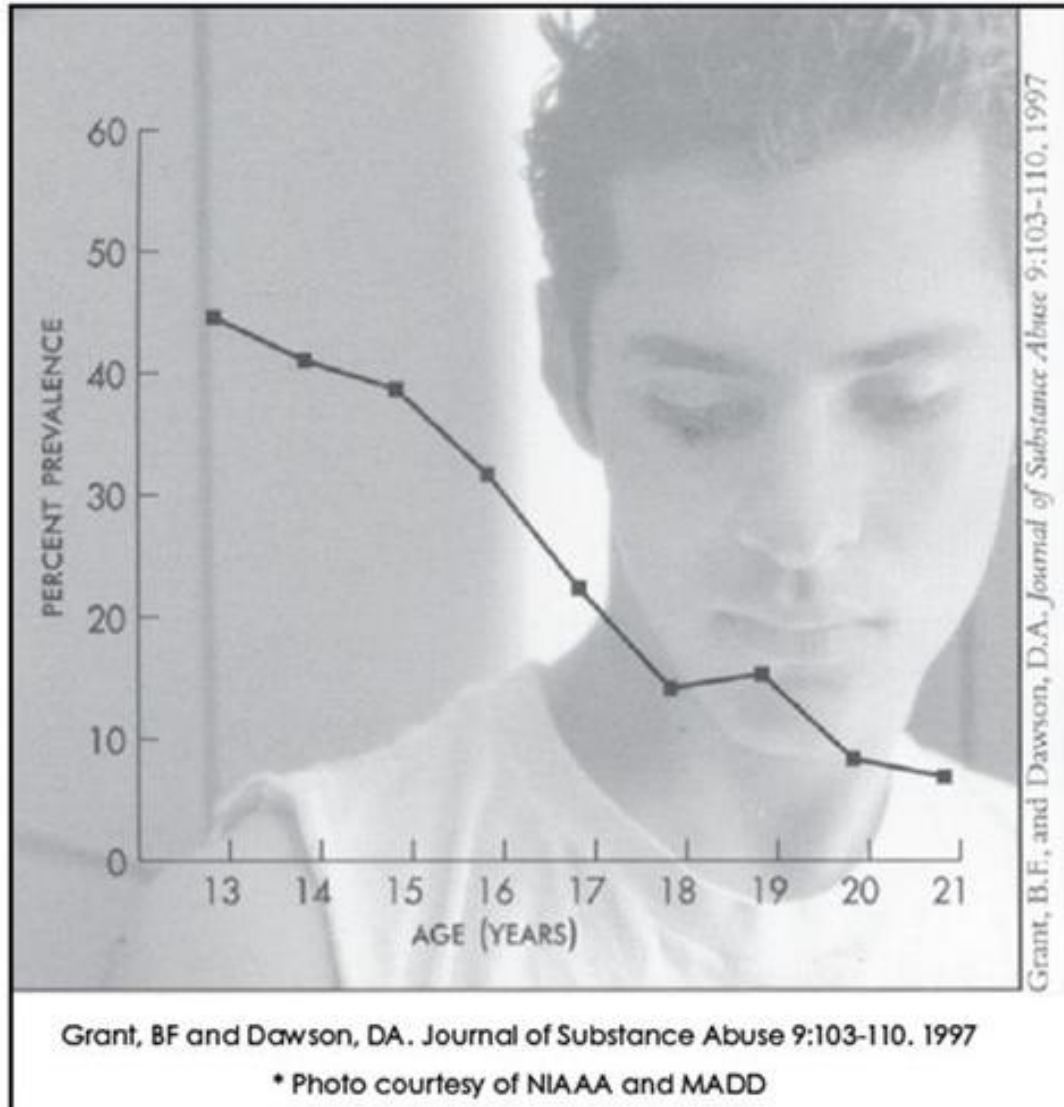
| Leading Causes of Death in US, 2013 |                                    | Odds Ratio Associated with $\geq 4$ ACEs |
|-------------------------------------|------------------------------------|--|
| 1                                   | Heart Disease                      | 2.2                                      |
| 2                                   | Cancer                             | 1.9                                      |
| 3                                   | Chronic Lower Respiratory Diseases | 3.9                                      |
| 4                                   | Accidents                          |  |
| 5                                   | Stroke                             | 2.4                                      |
| 6                                   | Alzheimer's                        | 4.2                                      |
| 7                                   | Diabetes                           | 1.6                                      |
| 8                                   | Influenza and Pneumonia            |  |
| 9                                   | Kidney Disease                     |  |
| 10                                  | Suicide                            | 12.2                                     |

Odds Ratio associated with  $\geq 4$  ACEs  
CDC 2015, Feletti 1998

# Most Important Predictors of Addiction

1. Genetics
2. History of trauma
3. Early use

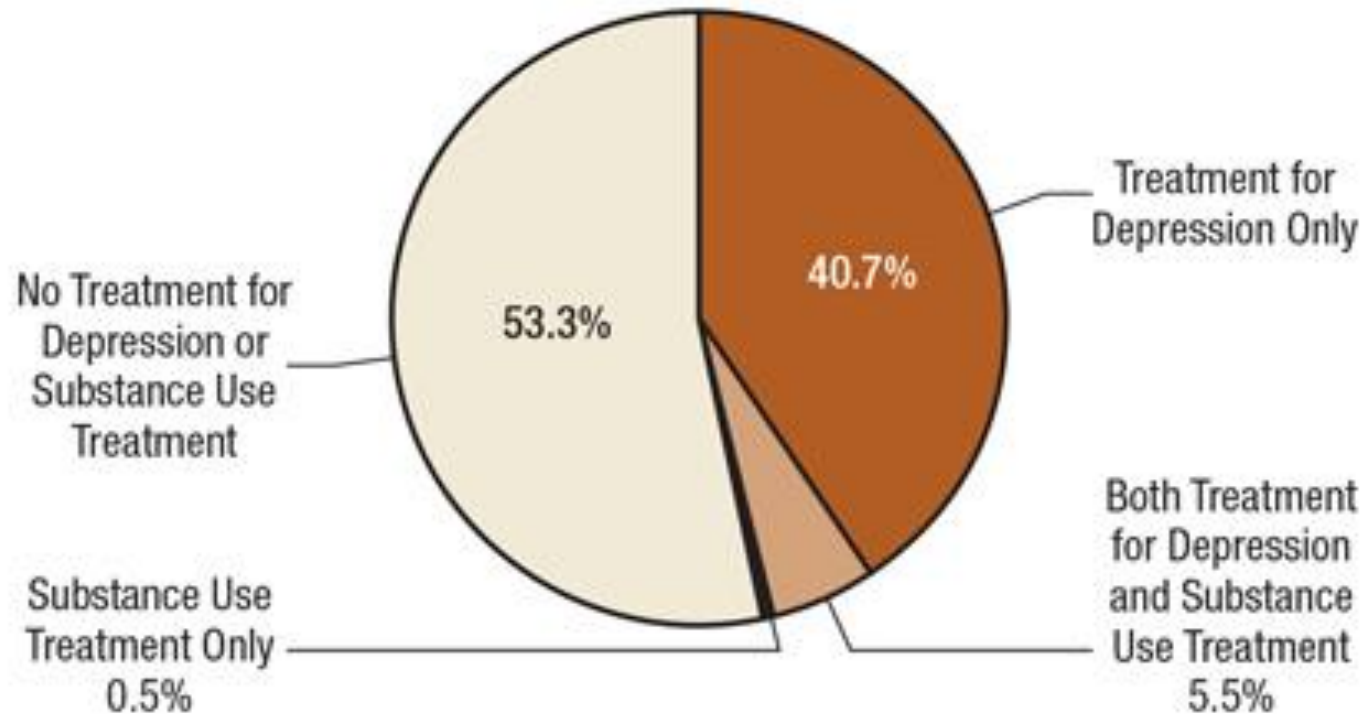
# Teen Alcohol Use Wires the Brain for Addiction



**40% of kids who begin drinking at age 15 will become alcoholics.**

**Only 7% of those who begin drinking at age 21 become alcoholics.**

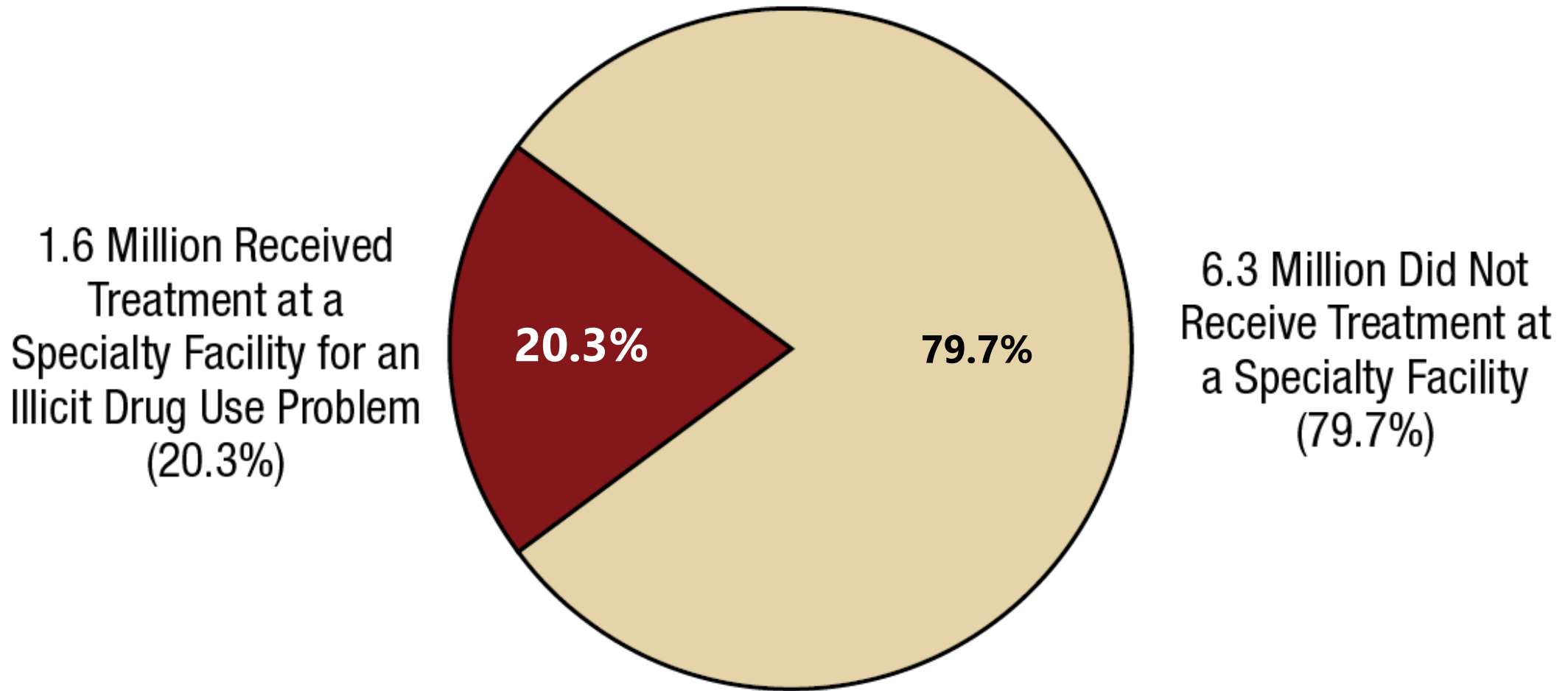
# TREATMENT OF MENTAL HEALTH IS OF UTMOST IMPORTANCE



214,000 Older Adolescents with Co-Occurring Major Depressive Episode and Substance Use Disorder

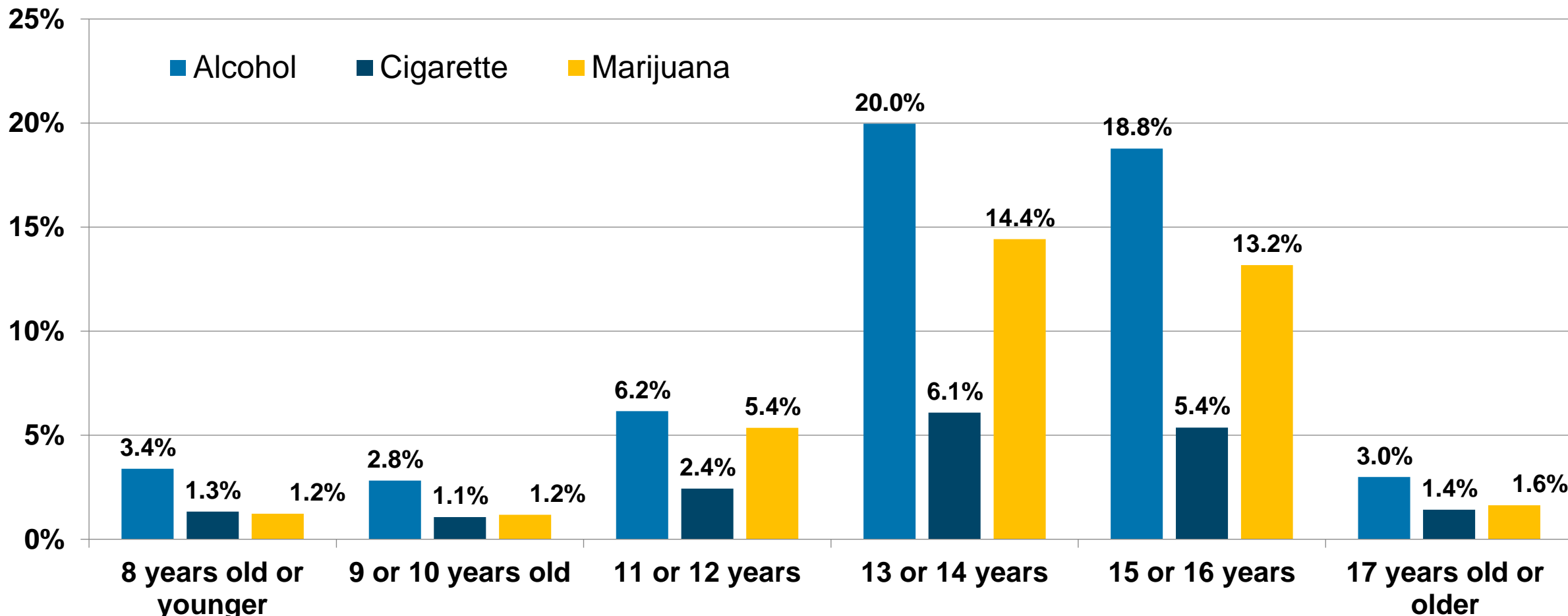
Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs), 2010 to 2011 (revised October 2013), and 2012.

# Substance Abuse & Depression, *cont.*



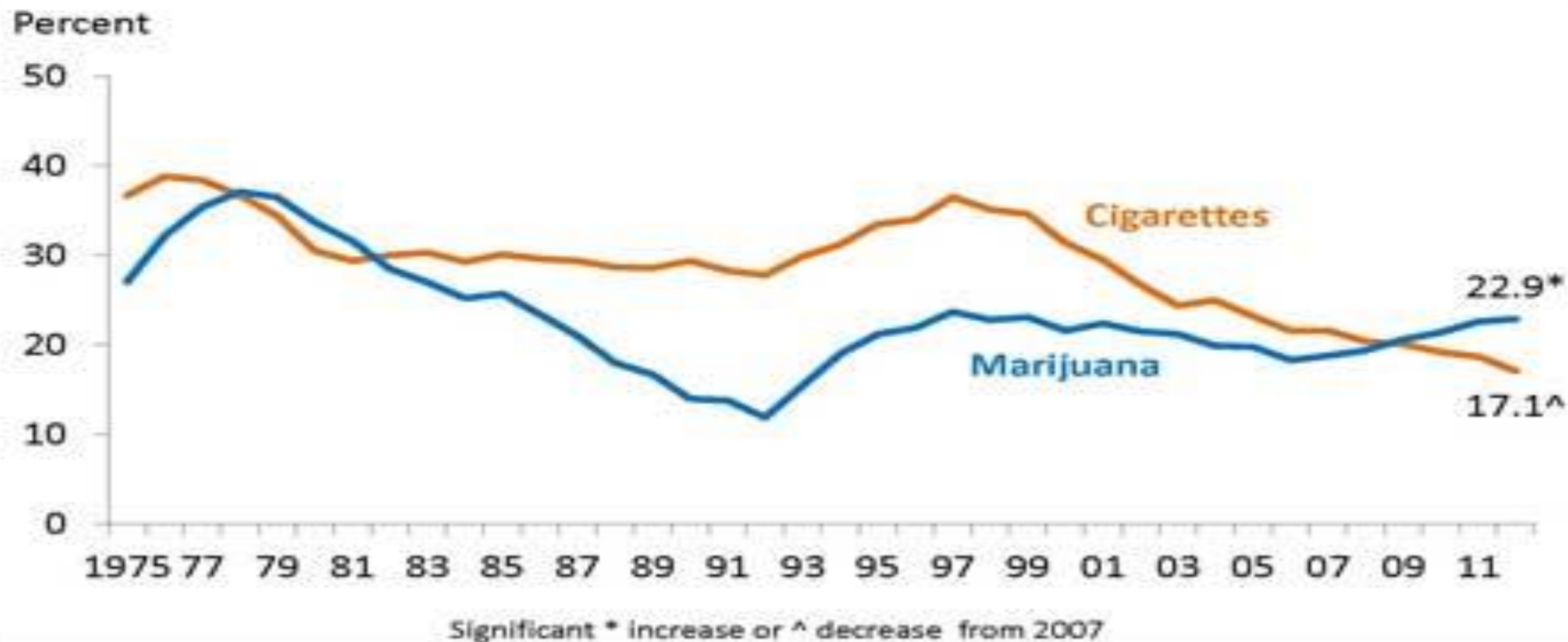
**7.9 Million Needed Illicit Drug Use Treatment**

# Youth Health Survey Results



Source: Central MA Regional Public Health Alliance Youth Health Survey, 2013

## Past Month Cigarette and Marijuana Use among 12th Graders, 1975 to 2012


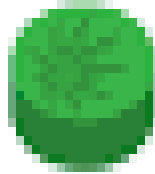

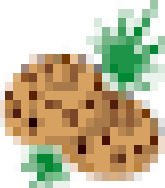


Source: University of Michigan, 2012 Monitoring the Future Study

# Dosage

# Experience

# Edible Recommendations

|            |              |   |
|------------|--------------|---|
| 1 - 10 mg  | Beginner     |  <b>Tinctures</b><br>(Provides measured dosing)      |
| 11 - 20 mg | Intermediate |  <b>Hard Candy</b><br>(Pre-determined dosing)        |
| 21 - 65 mg | Moderate     |  <b>Syrups</b><br>(Provides creative options)       |
| 66 mg +    | Expert       |  <b>Baked Goods</b><br>(High THC content per cost) |





**Edipure**  
Fruit Jellies  
125mg THC : 5 Individually Infused 25mg Pieces  
Net wt. 11g

**Edipure**  
Gourmet Tropical Fruit  
100mg THC : 10 Individually Infused 10mg Pieces  
Net wt. 21g

**Edipure**  
Watermelon Tarts  
100mg THC : 10 Individually Infused 10mg Pieces  
Net wt. 21g



**Edipure**  
Fruit Jellies  
125mg THC : 5 Individually Infused 25mg Pieces  
Net wt. 11g

**Edipure**  
Cherry Cola Bottles  
100mg THC : 10 Individually Infused 10mg Pieces  
Net wt. 21g





## Nearly a half million

people have died from drug overdoses in the United States from 2000 to 2014.

**78**

Americans die every day from an opioid overdose—including prescription opioids and heroin.

**249 million**

prescriptions were written in 2013—enough for every adult American to have a bottle of pills.

# Then: Addiction is a Crime

- For decades, we have responded to addiction with incarceration instead of treatment.
- **1970:** Nixon declares a “**War on Drugs.**”
  - **Mandatory sentencing:** Ex. Rockefeller Drug Laws create minimum mandatory sentences of 15 years to life for possession of 4 ounces of narcotics.
- **1980s:** Zero tolerance policies incarceration mostly of Blacks and Latinos.
- “Just Say No” anti-drug campaign
  - Anti-addict sentiment: “ **drug users should be taken out and shot**” (Los Angeles Police Chief Daryl Gates).
- **Prison population has quadrupled since 1980.**
- **Over 50% of federal inmates are there for drug offenses.**

# Now: Addiction is a Disease

- **Pre 1990** opioids to treat only **acute pain and cancer**.
- **1995** FDA approves extended release opioid: **OxyContin**.
- **2000** NIH presents **disparities** in health care and the treatment of pain that was not being treated adequately.
- JACHO Providing Safe, High Quality care. **Pain is the fifth vital sign**.
- Increase use of opiates by **younger and affluent community**. Parents able to lobby and demand treatment.
- **Addiction is a disease and no longer a moral weakness**.

Wong-Baker FACES® Pain Rating Scale



**0**

No  
Hurt



**2**

Hurts  
Little Bit



**4**

Hurts  
Little More



**6**

Hurts  
Even More



**8**

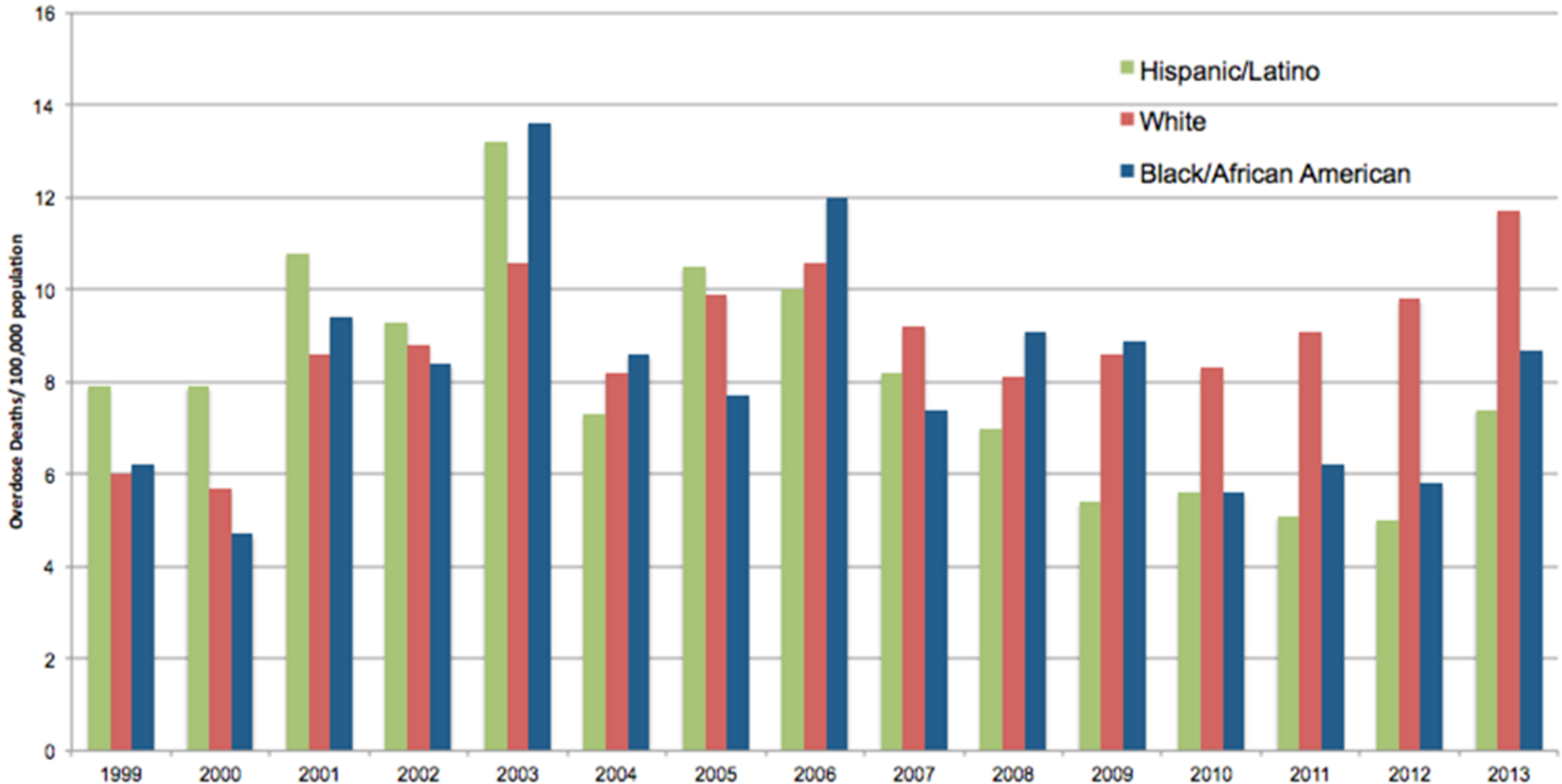
Hurts  
Whole Lot



**10**

Hurts  
Worst

# MA Overdose Deaths by Race: 1999-2013



via CDC WONDER Online Database

# OXY EXPRESS



# Highway 95

90 percent of oxycontin came from the clinics in Florida via highway 95

There were 900 pain clinics in Florida

People would travel in tour buses

Doctors bought 89 percent of the oxycontin sold in the country 2011

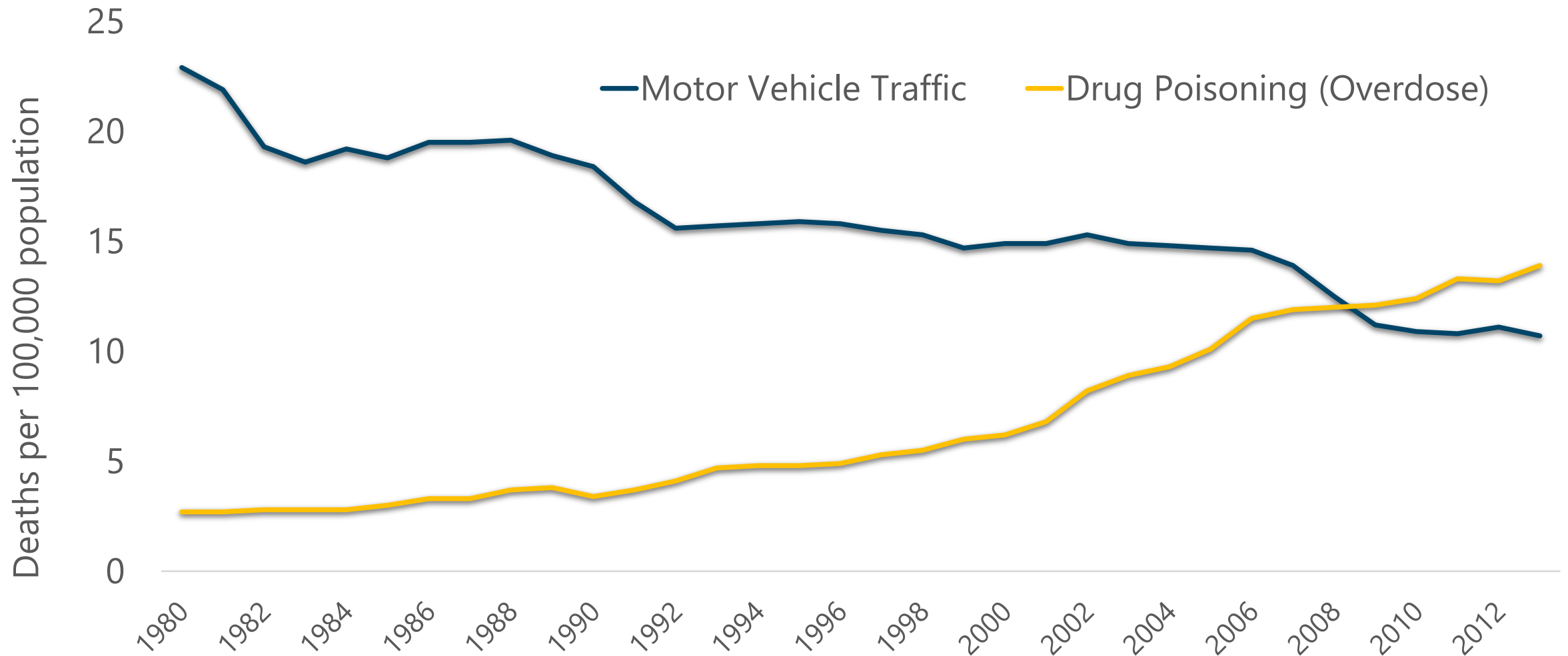
Mandated to shut down pill mills

American doctors were the dealers

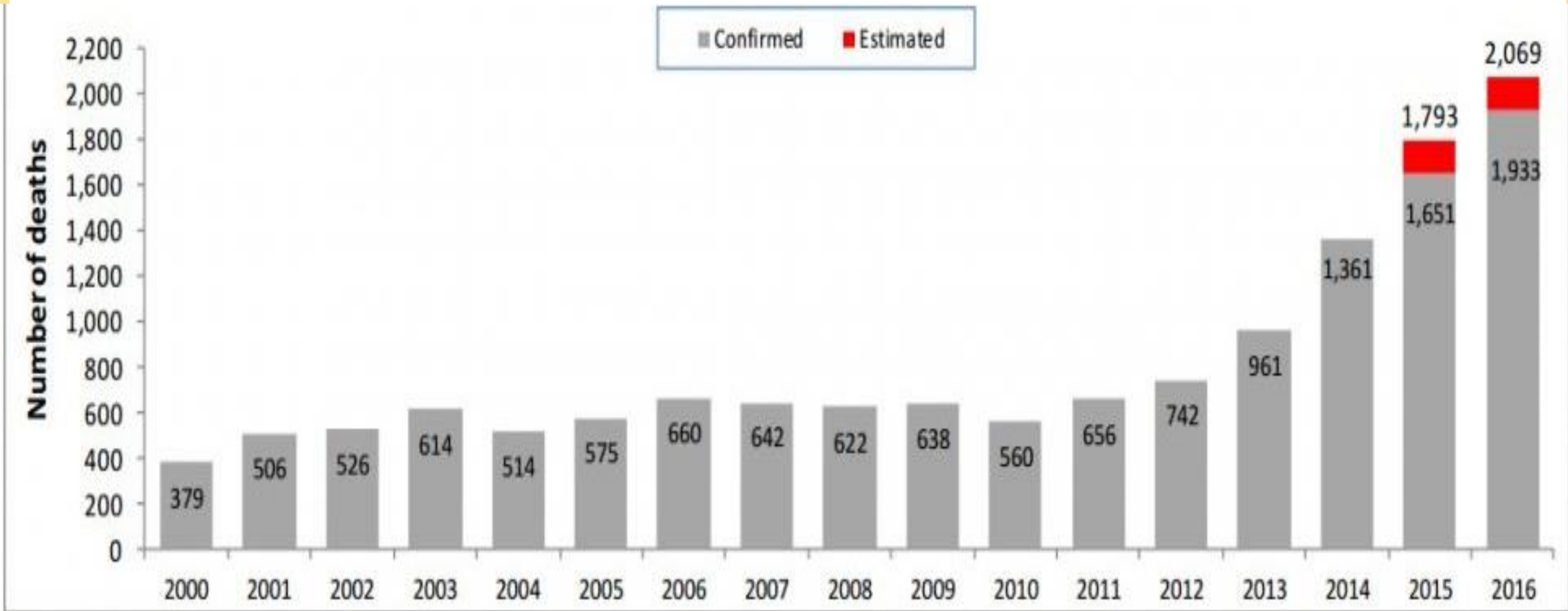


# Motor vehicles was the highest cause of accidental deaths and now overdoses have taken over

**We can do the same for overdoses**



# Opioid-Related Deaths, All Intent Massachusetts Residents: January 2000-December 2016



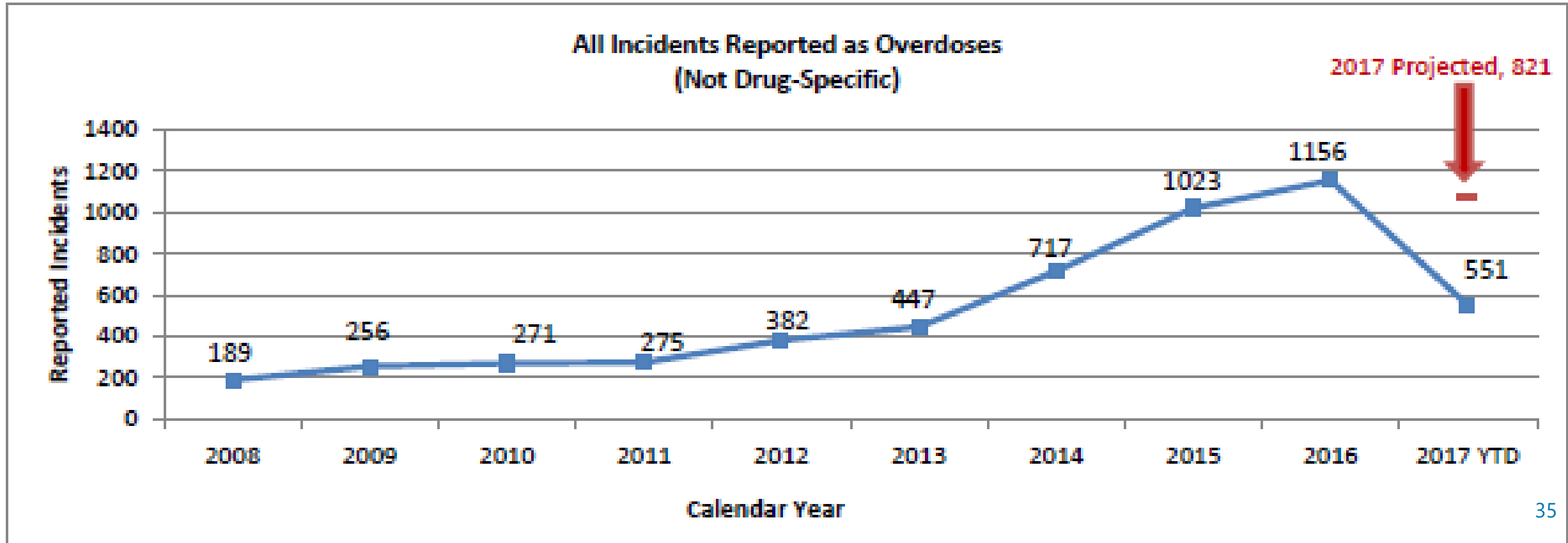
Note: Counts for 2000 – 2014 have been updated following a review of cases that did not receive an official cause of death at the time the files were closed.

# Worcester Overdoses

Worcester Police Department - Overdose Report  
Prepared By Crime Analysis on 7/6/17

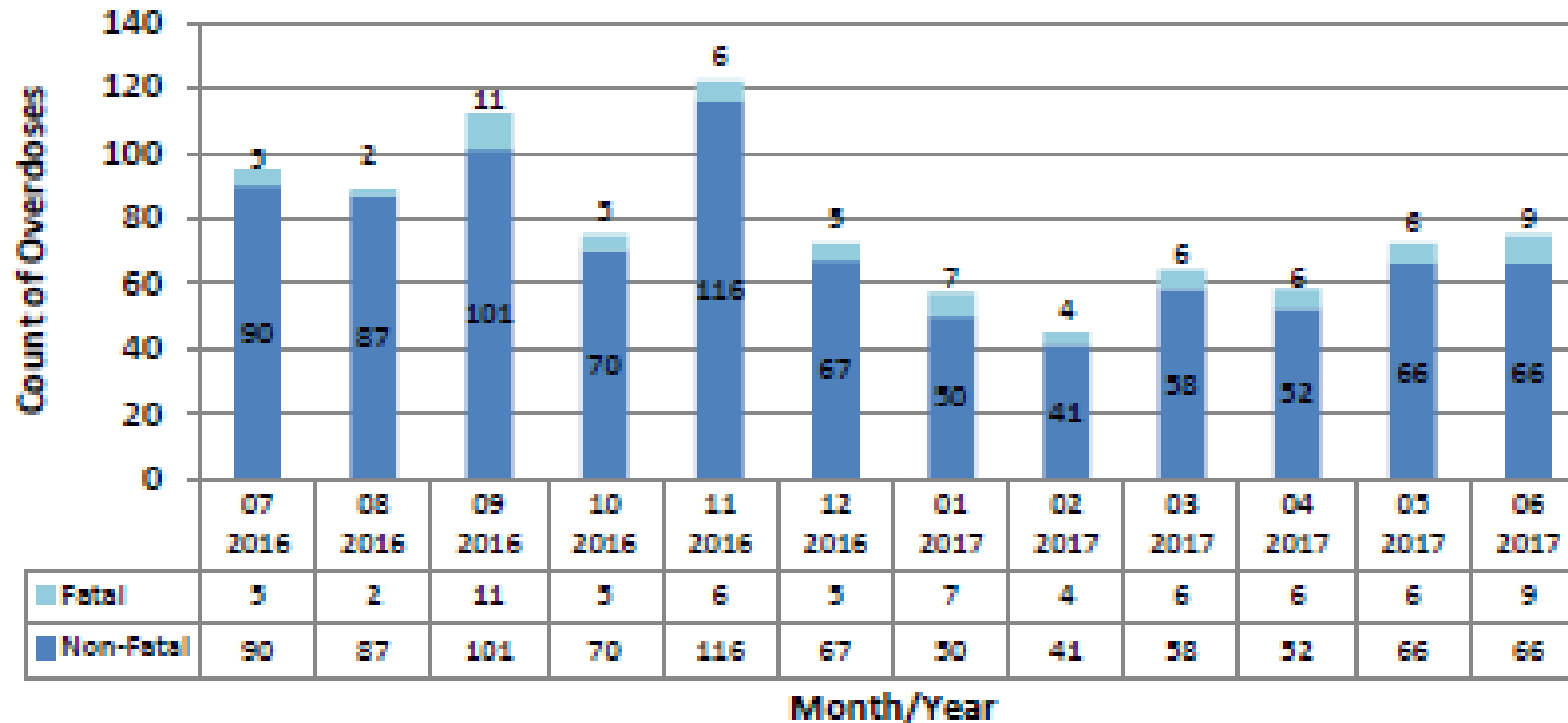
June 2017  
Reported Opiate Overdoses in June 75

## Long Term Overdose Trends (Previous 10 Years)



# Confirmed & Suspected Heroin/Opiate-Related Overdoses in the Previous 365 Days

**Confirmed and Suspected Heroin/Opiate-Related Overdoses  
Previous 12 Months**



## Temporal Data

### Incidents By Day of Week

|     |     |
|-----|-----|
| Sun | 103 |
| Mon | 122 |
| Tue | 105 |
| Wed | 125 |
| Thu | 146 |
| Fri | 166 |
| Sat | 148 |

### Incidents By Shift

|            |     |
|------------|-----|
| Days       | 290 |
| First Half | 467 |
| Last Half  | 158 |

# Fentanyl adulterated heroin

- Integrated into heroin supply
- 30-40x stronger than heroin by weight
- In addition to fentanyl there are reports of **fentanyl analogues:**

Acetyl fentanyl

Butyryl fentanyl

Furanyl-fentanyl

Parafluoro-fentanyl

Carfentanil

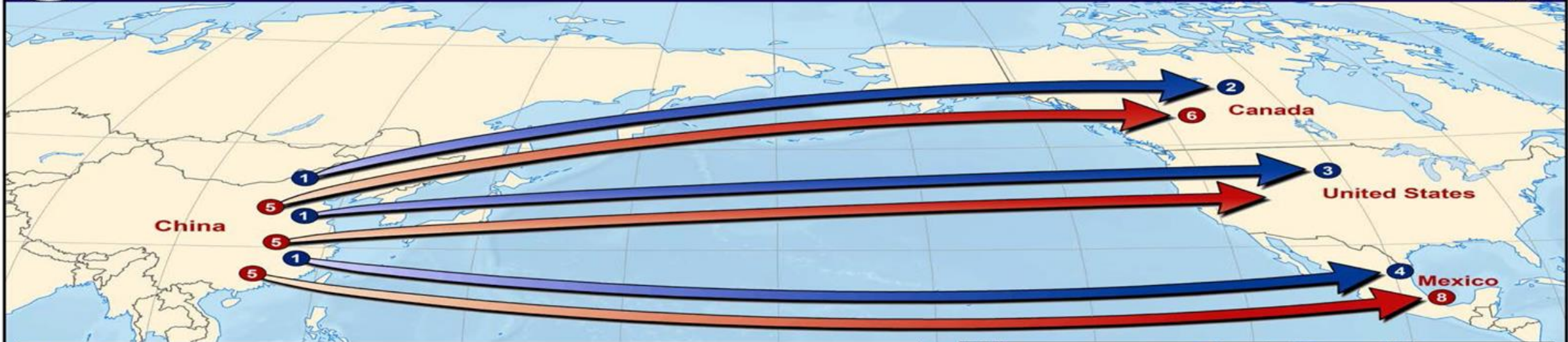
## **Novel synthetic opioids:**

- U47700

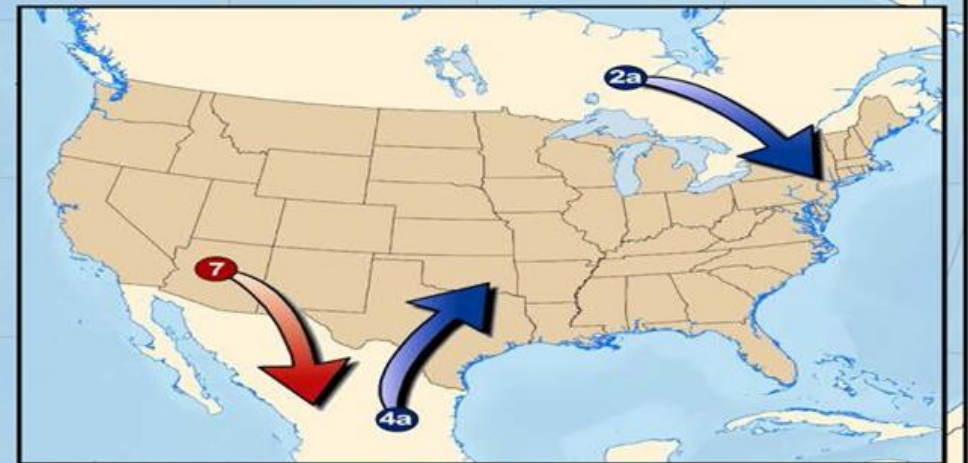
Sources: various. National Drug Early Warning System (NDEWS) listserve alerts

# Flow of fentanyl

## (U) Illicit Fentanyl and Fentanyl Precursor Flow Originating in China



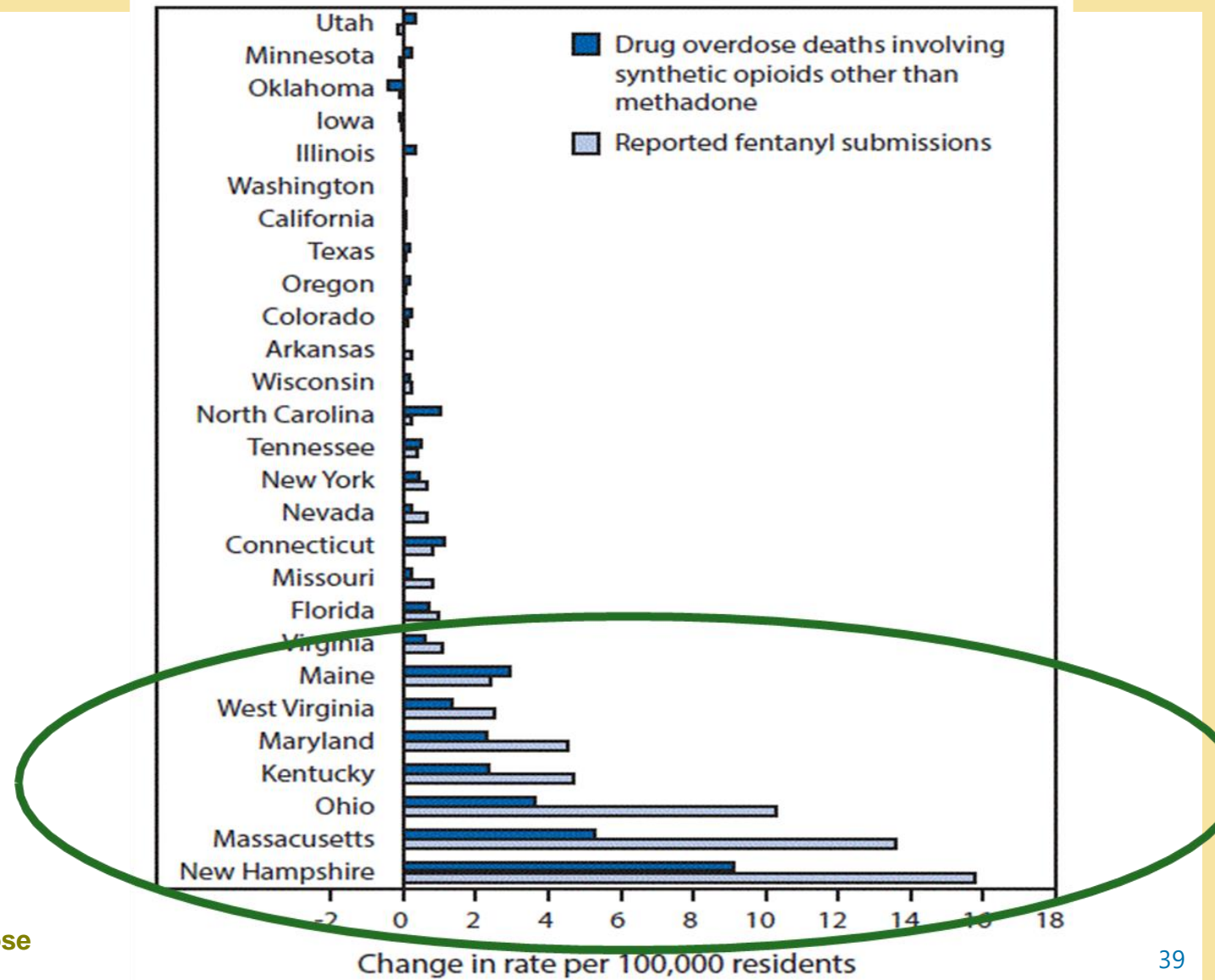
- 1 Fentanyl in powder form and pill presses are shipped via mail services.
- 2 The powder fentanyls are processed and mixed with heroin, or sold as heroin, or pressed into pills and sold in the Canadian drug market.
  - 2a Some fentanyl products are smuggled from Canada into the United States for sale, on a smaller scale.
- 3 The powder fentanyls are processed and mixed with heroin, or sold as heroin, or pressed into pills and sold in the United States drug market.
- 4 The powder fentanyls are cut and diluted for further smuggling, or pressed into counterfeit prescription pills.
  - 4a Diluted powder fentanyls and counterfeit prescription pills containing fentanyl are smuggled from Mexico into the United States.
- 5 Precursors for manufacturing fentanyls are shipped via mail services.
- 6 Precursors are used to manufacture fentanyls in clandestine laboratories.
- 7 Precursors are likely smuggled across the Southwest border into Mexico to manufacture fentanyls.
- 8 Precursors are likely used to manufacture fentanyls in clandestine laboratories.



# CDC: 27 States Report

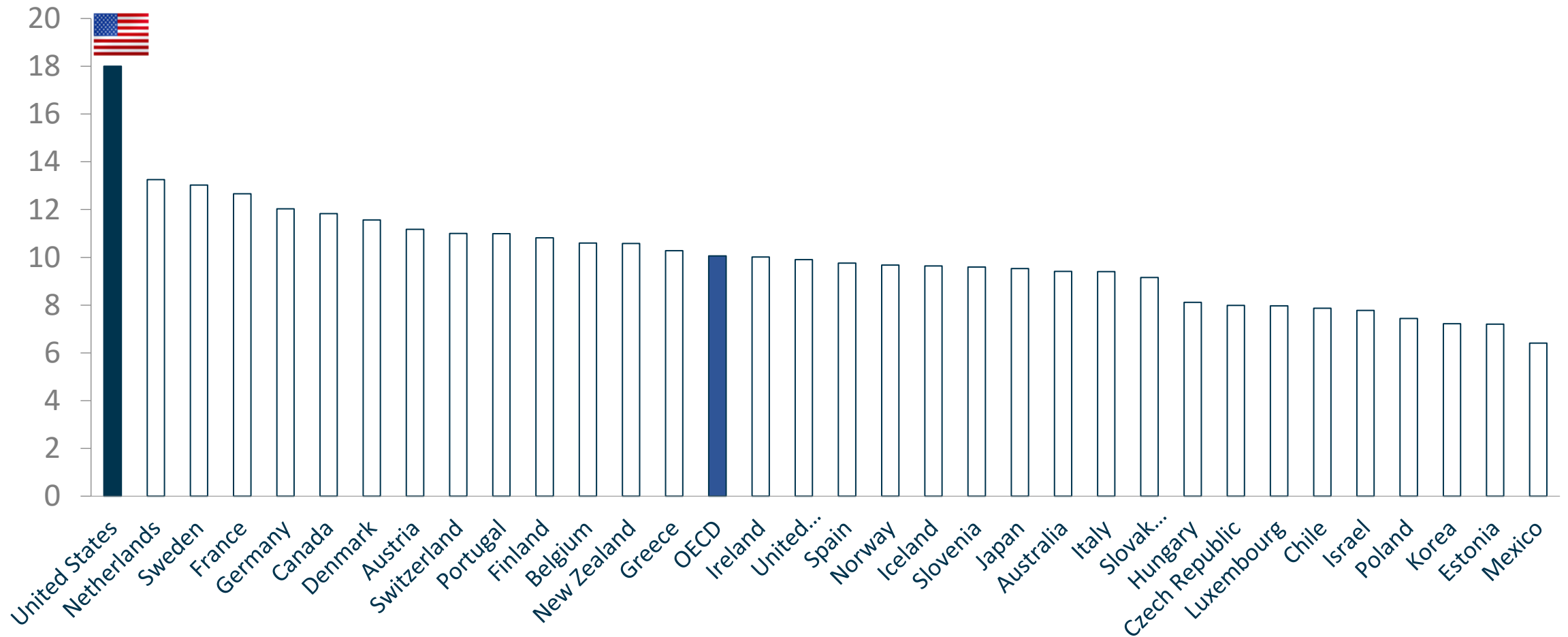
## Increases in synthetic opioid overdose deaths

Concentrated in 7 states



Gladden RM, Martinez P, Seth P. Fentanyl Law Enforcement Submissions and Increases in Synthetic Opioid-Involved Overdose Deaths — 27 States, 2013–2014. MMWR

# Health Expenditures as a % of GDP, 2009





# US HEALTH RANKINGS

## Maternal Mortality

Rank: 25<sup>th</sup> among OECD countries



## Life Expectancy

Rank: 26<sup>th</sup> among OECD countries



## Low Birth Weight

Rank: 28<sup>th</sup> among OECD countries



# Social Services



employment  
programs



supportive  
housing  
& rent subsidies

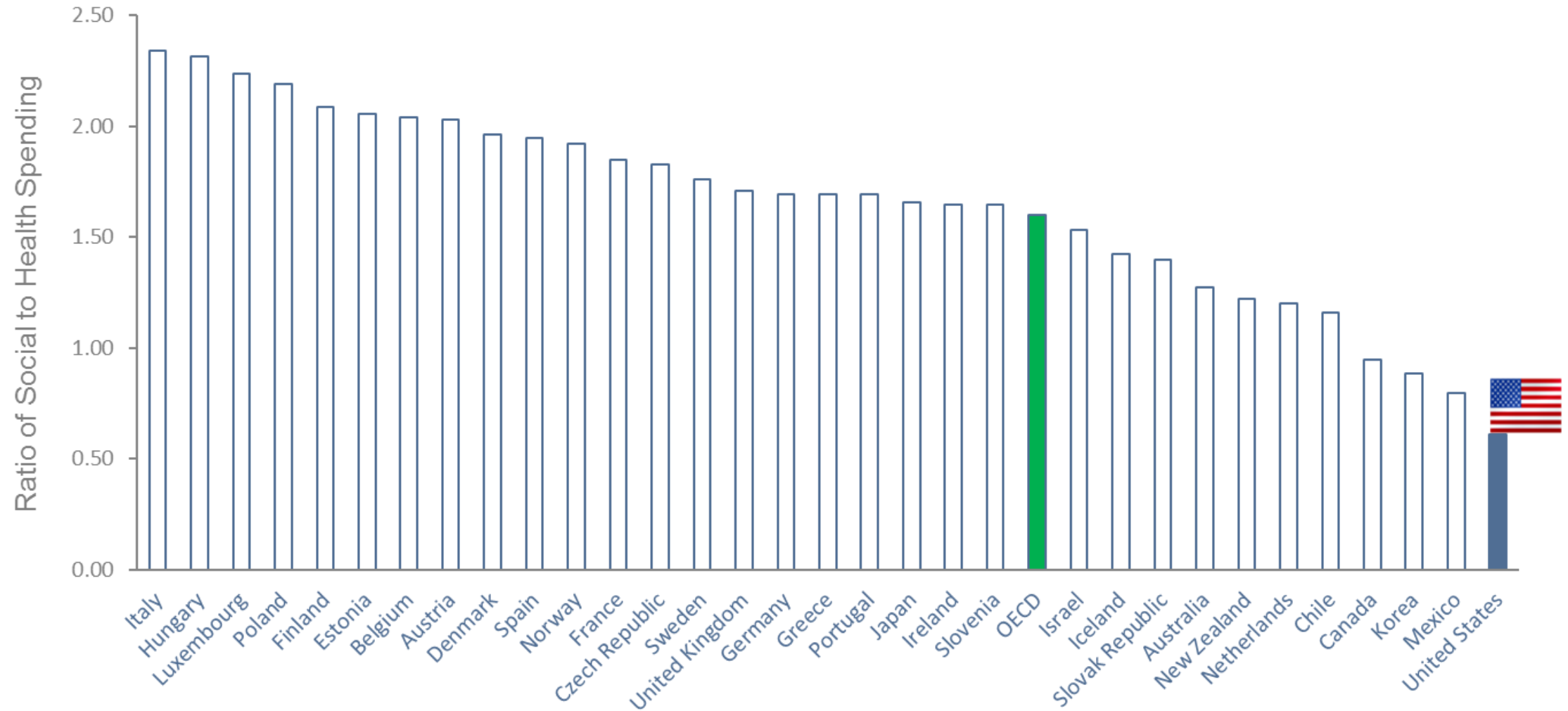


nutritional  
support &  
family  
assistance



other social  
services that  
exclude  
health  
benefits

# Ratio of Social to Health Expenditures, 2009\*



\*Switzerland and Turkey are missing data for 2009

# What Determines Health?

Healthcare



Genetics



Social, Environmental, Behavioral Factors



# Continuing Challenge of Perverse Incentives

*“We had a really successful out-patient diabetes center: so successful that it reduced the number of hospitalizations, amputations etc, dramatically. So the hospital shut it down because it lost them money.”*

- Nurse Interviewee

Homeless is part of the social determinants of health, which if instituted in healthcare will improve outcomes

A study from Los Angeles, CA – home to ten percent of the entire homeless population – **found that placing four chronically homeless people into permanent supportive housing saved the city more than \$80,000 per year**