The Trauma of the Opioid Crisis

Deaths of Despair (and how to Reduce them)

Presented by Emily Brunner, MD

Fellow and Diplomate of Addiction Medicine

President of the Minnesota state Chapter of ASAM

DISCLOSURES

- None;
- I am not speaking on behalf of ASAM today
- I am employed by St. Joseph hospital-
  - No other source of rubles or dollars

Objectives

1. Understand the epidemiology of opioid use disorder and related traumatic psychopathology (Major depressive disorder-> Suicide; alcoholic liver disease)
2. Understand likely Factors that underlie these diseases and how they are related
3. Explore treatment paradigms for Modern approach to treatment of Opioid use disorder and comorbid psychiatric disease with trauma informed care and recovery oriented systems of care

What is an opioid (opiate)?

- Class of drugs derived from opium (opium is the naturally occurring drug mixture that is derived directly from the juice of the opium poppy)
- Opium naturally contains the active ingredients morphine (4-21%), codeine (0.7-2.5%), and thebaine (<0.1%)
- **Opioids** refer to all compounds, natural and synthetic, functionally related to opium
- Substances include:
  - **Morphine** (Roxanol, Kadian, Avinza, MS Contin)
  - **Codeine**

WHO IS THIS?

What is an opioid -> mu receptor agonist

- **Heroin** (diacetylmorphine)
  - Is a semi-synthetic opioid
  - First synthesized by the Bayer company in the 1870s
  - It is a prodrug that is not itself active
  - It is rapidly metabolized by the liver into 6-mono-acetyl morphine and morphine
  - Heroin has a rapid onset of action and a very short half-life, making it a popular drug of abuse
- Derivatives of thebaine (semi-synthetics and synthetics):

  Semi-Synthetics
  - **Oxycodone** (Roxicodone, Percocet, Oxycontin)
  - **Hydromorphone** (Dilaudid)
  - **Hydrocodone** (Vicodin, Lorcet, Lortab)
  - **Buprenorphine** (Buprenex, Subutex)
- Derivatives of thebaine (semi-synthetics and synthetics):

  Synthetics
  - **Meperidine** (Demerol)
  - **Methadone** (Dolophine, Methadose)
  - **Butorphanol** (Stadol)
  - **Fentanyl** (Sublimaze, Duragesic)
  - **Propoxyphene** (Darvon, Darvocet) *now banned by the FDA*

A bottle of Bayer's heroin. Between 1890 and 1910 heroin was sold as a non-addictive substitute for morphine AND a cure for respiratory ailments

"MORPHINISM" OF THE CIVIL WAR

- THERE HAS REPEATEDLY BEEN A CORRELATION BETWEEN INCREASED SOCIETY OPIOID USE AND INCREASED SOCIETAL TRAUMA

One out of every five southern males of military age were killed in the war. Families therefore turned to use;"Maimed and shattered survivors from a hundred battle-fields," Horace B. Day wrote in 1868, "diseased and disabled soldiers released from hostile prisons, anguished and hopeless wives and mothers, made so by the slaughter of those who were dearest to them, have found, many of them, temporary relief from their sufferings in opium." (Courtwright, Civil War History 1978)

Morphinism during this period was worse in the South, and was worse in Women. Much was iatrogenic, and it often involved hypodermic needles, as they had only been recently invented (access limited until after the war; physicians would often leave the patient a bedside needle)

VIETNAM WAR – IV HEROIN

- Upon their return from war it was found
- Almost half of the "general" service members tried heroin or opium while in Vietnam and one-fifth developed physical dependence
- Yet on return->2/3 of the veterans were able to attain meaningful remission after a brief detoxification
  - Robins 1974

FROM 2015-2017, THE LIFE EXPECTANCY IN THE US DECLINED PROGRESSIVELY, DUE LARGELY TO DEATHS FROM DRUG OVERDOSE, SUICIDES AND ALCOHOLIC LIVER DISEASE

*IN 2018, LIFE EXPECTANCY ROSE SLIGHTLY

the last time life expectancy declined in this manner was from 1915-1918, when both World War II and the 1918 flu pandemic occurred

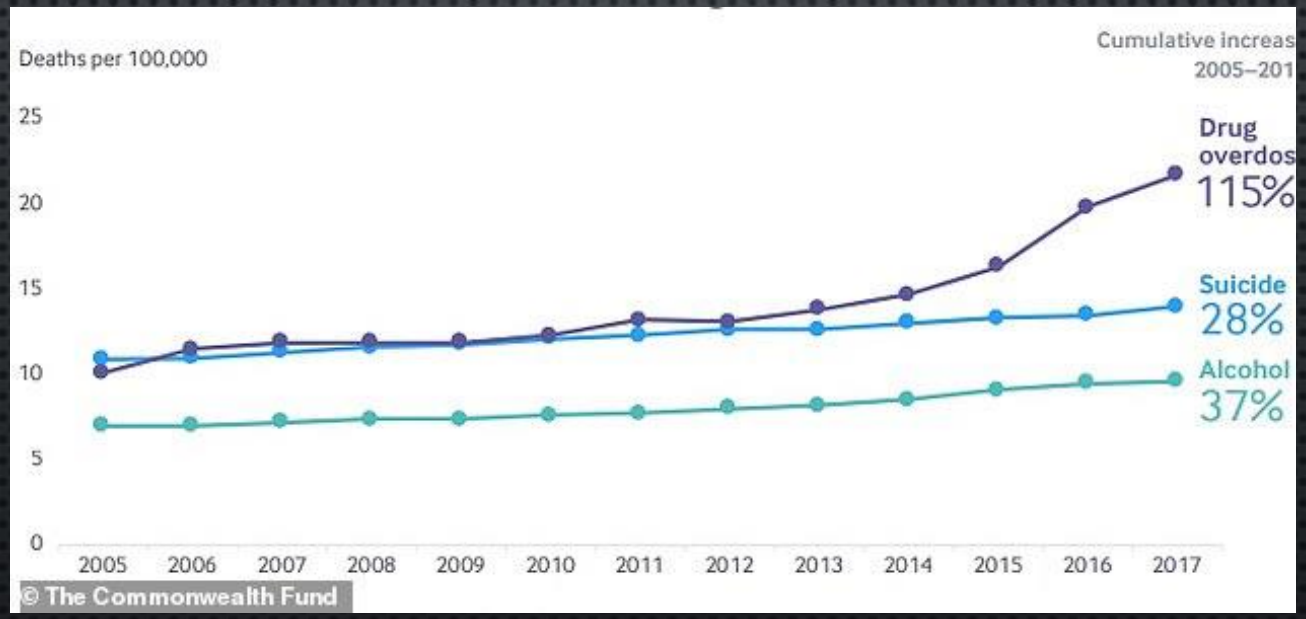
This is a crisis of massive proportions

Of note, this occurred right after the 1914 Harrison Narcotic Act which ended maintenance treatment for opioid use disorder in stable patients; Causal link: Not proven

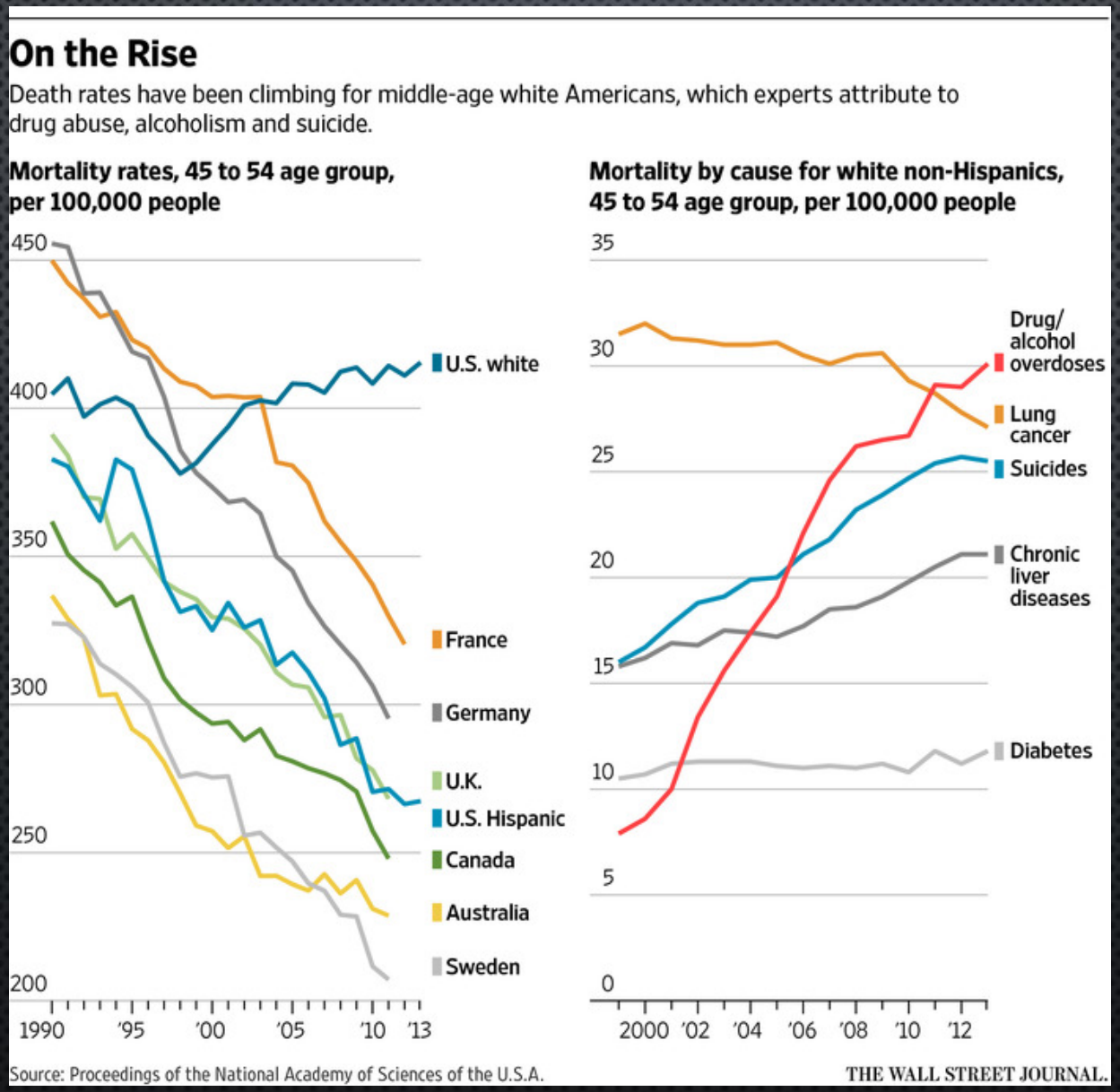
EDITORIAL IN NEW YORK MEDICAL JOURNAL MAY 15 1915

As was expected ... the immediate effects of the Harrison antinarcotic law were seen in the flocking of drug habitues to hospitals and sanatoriums. Sporadic crimes of violence were reported too, due usually to desperate efforts by addicts to obtain drugs, but occasionally to a delirious state induced by sudden withdrawal....The really serious results of this legislation, however, will only appear gradually and will not always be recognized as such. These will be the failures of promising careers, the disrupting of happy families, the commission of crimes which will never be traced to their real cause, and the influx into hospitals to the mentally disordered of many who would otherwise live socially competent lives.

"DEATHS OF DESPAIR": TERM COINED PER THE BROOKING INSTITUTE IN 2015



- US IS THE DARK BLUE LINE, AND IS THE ONLY MORTALITY LINE CLIMBING; OF NOTE US HISPANIC MORTALITY PARALLELS OTHER DEVELOPED COUNTRIES

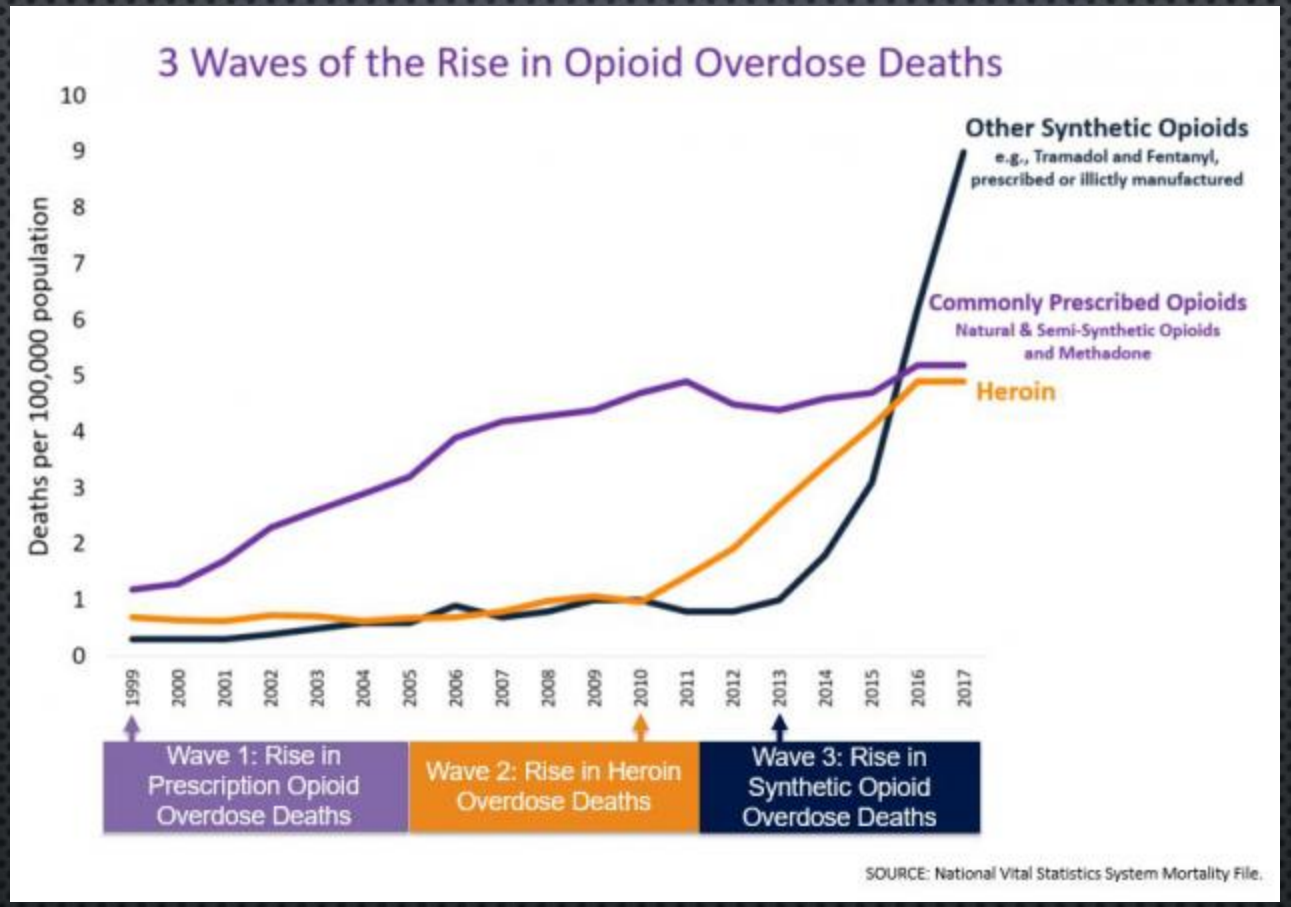


FOR AGES 45-54, DRUG OVERDOSE, SUICIDE AND CIRRHOSIS ARE RISKING EVEN AS DIABETES MORTALITY IS FLAT, AND LUNG CANCER DEATH IS DECLINING

WAVE 1: PRESCRIPTION OPIOIDS; 1990S

WAVE 2: RISE IN HEROIN DEATHS, 2010

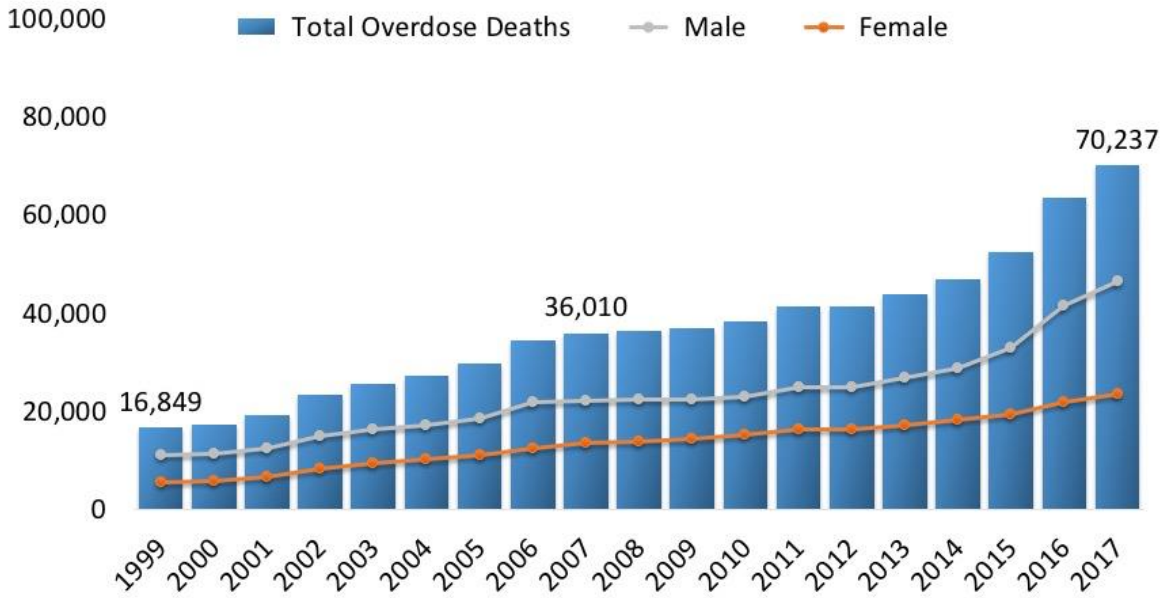
WAVE 3: RISE IN SYNTHETIC OPIOID DEATHS; 2013



- FROM 1999 TO 2017, MORE THAN 702,000 PEOPLE HAVE DIED FROM A DRUG OVERDOSE
- IN 2017 ALONE; >70,000 PEOPLE DIED OF DRUG OVERDOSE, AND >68% OF THOSE CASES INVOLVED AN OPIOID (THAT IS 130 AMERICANS PER DAY IN 2017)

RAPIDLY LETHAL

Figure 1. **National Drug Overdose Deaths** Number Among All Ages, by Gender, 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

Every year, 2% of the 2.1 million Americans who have Opioid Use Disorder in the US are killed

EPIDEMIOLOGY OF SUICIDE

- Both suicide and overdose deaths have been rising progressively over the past decade
- At this time, 44,193 deaths occurred in the US, which translates into 1 in suicide every 12 minutes
- Over half of the people who die of suicide do not have a known mental health diagnosis
    - People without MH conditions are more likely to be male and to die via firearms
- In the US, the suicide rate increased from 1999 to 2016 by 25.4% (In MN it was 40.6%)
    - In 2017, Suicide was the eighth-leading cause of death in Minnesota, accounting for 783 deaths (Star Tribune)
- For every one suicide in 2014 there were 9 adults treated in hospital emergency departments for self- harm , 27 who made a suicide attempt, and over 227 who reported seriously considering suicide

Some Good News- 2018 Epidemiology

- In 2018, there was a 5% reduction nationally of opioid overdose numbers per the CDC AND a life expectancy INC of 0.1 years
  - Suicides increased by 1.4 % overally, larger for men than women
- In Minnesota overdose death declined significantly from to 422 to 331
  - Significant racial disparity exists in access to treatment per the MDH
  - In 2016, Native Americans were 6 times as likely to die of a drug overdose as Caucasians
- Nationwide: Also >20% rise in methamphetamine deaths, from 10,749 in 2017 to 12,987 in 2018

BLACK SPIRE OUTPOST

MENTAL AND SUBSTANCE USE DISORDERS IN AMERICA

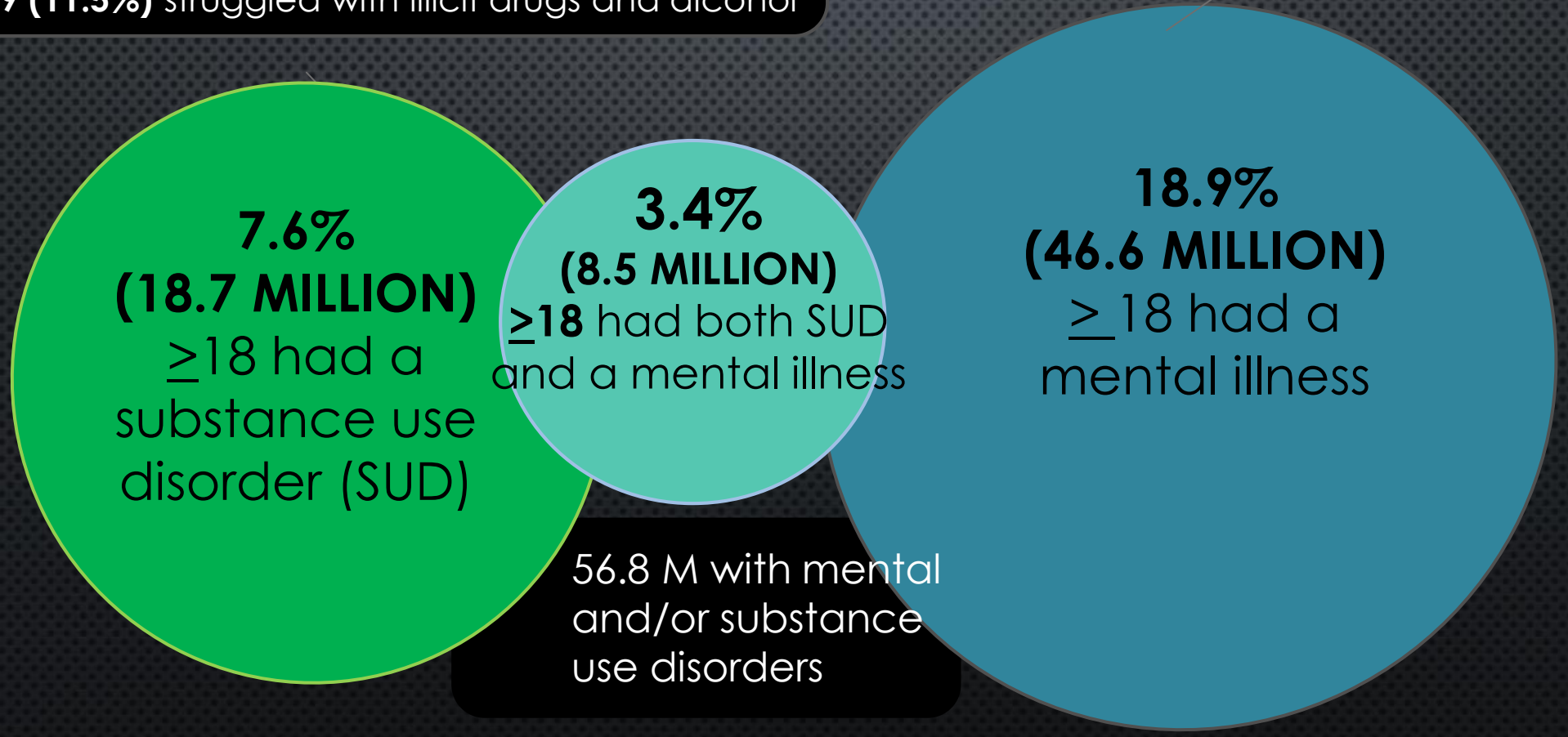
PAST YEAR, 2017 NSDUH, 18+

Among those with a substance use disorder:

- **3 IN 8 (36.4%)** struggled with illicit drugs
- **3 IN 4 (75.2%)** struggled with alcohol use
- **1 IN 9 (11.5%)** struggled with illicit drugs and alcohol

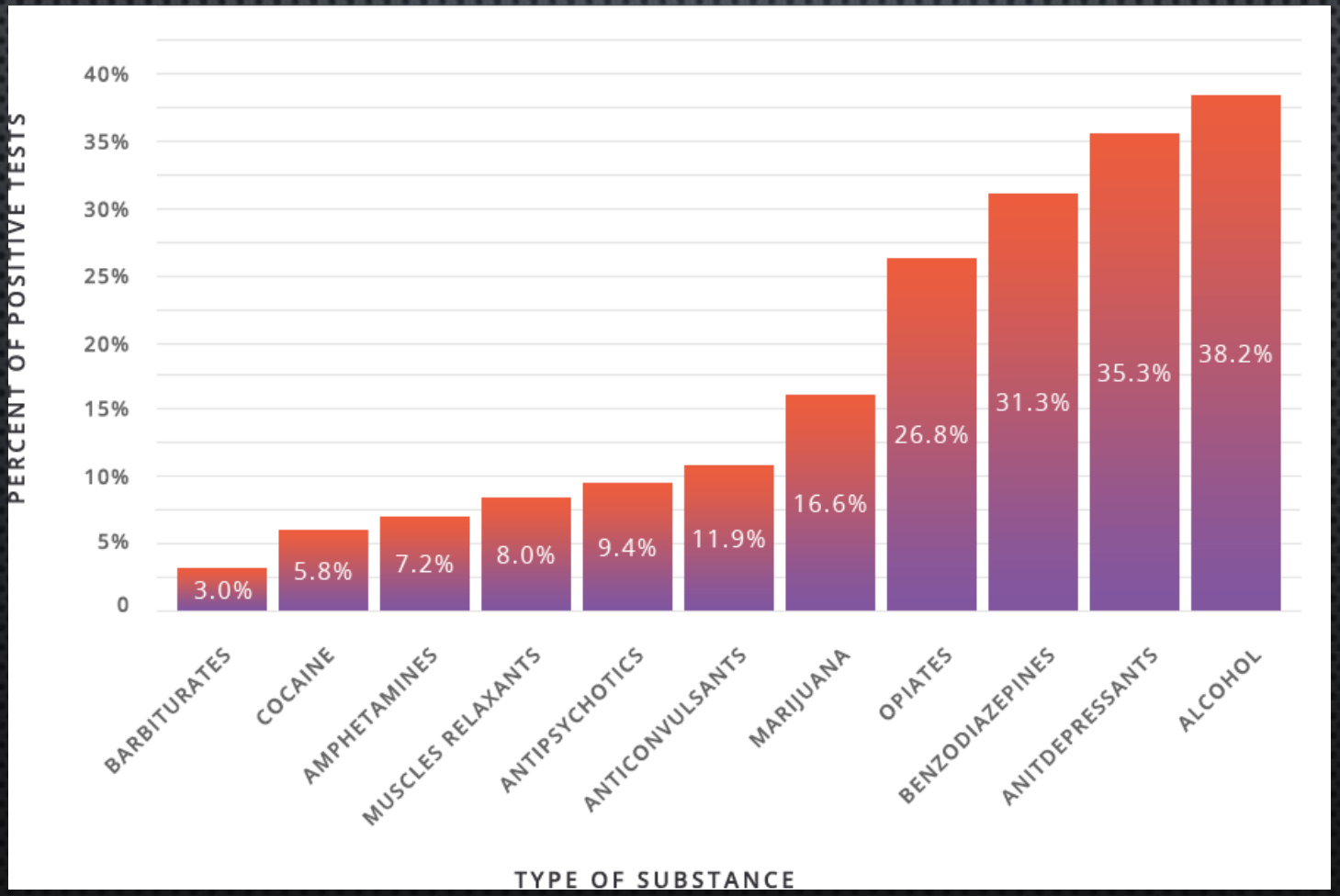
Among those with a mental illness:

- **1 IN 4 (24.0%)** had a serious mental illness



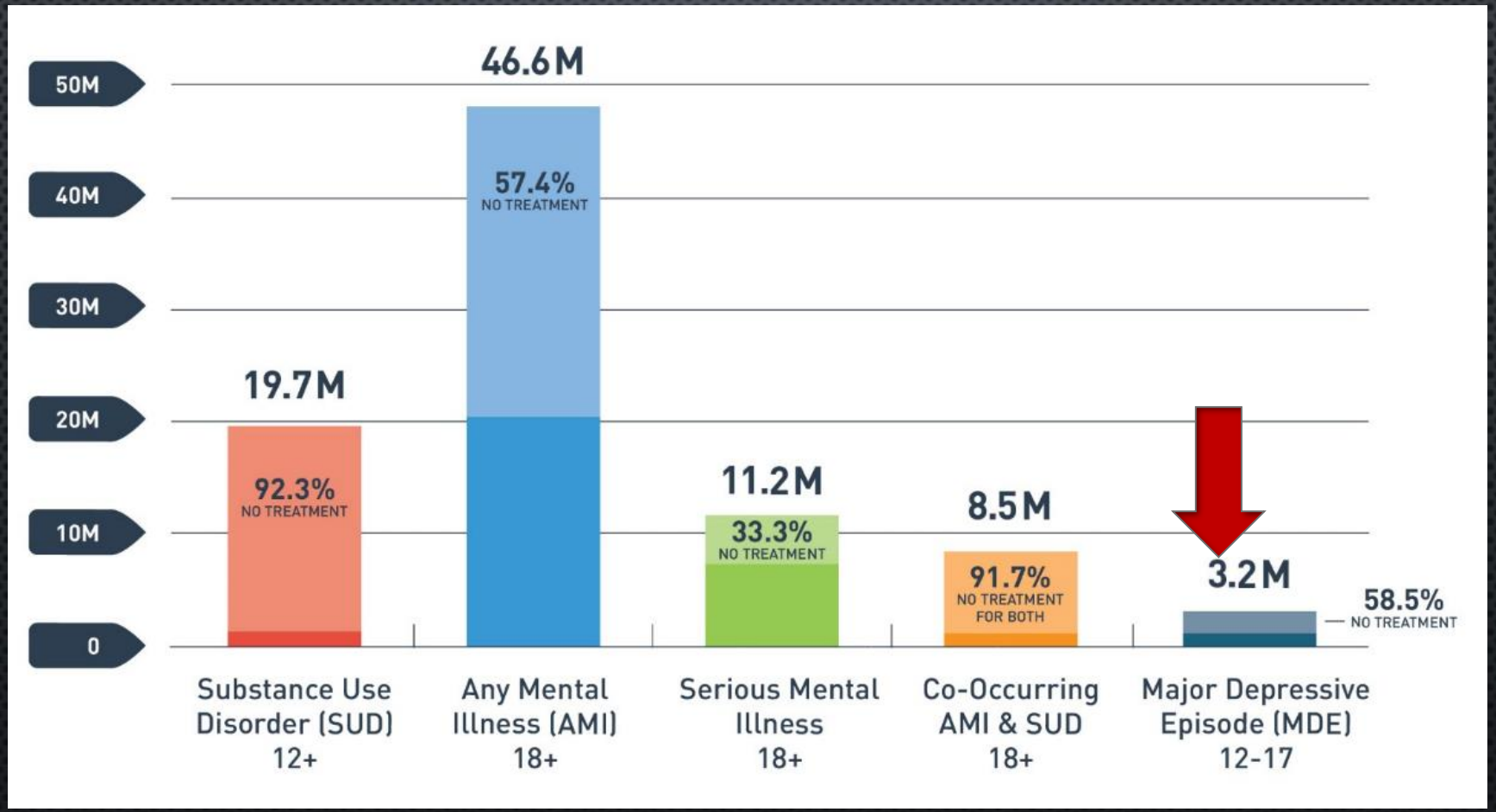
56.8 M with mental and/or substance use disorders

FROM 2013- % OF POSITIVE SUBSTANCES IN PEOPLE AFTER A SUICIDE



DESPITE OUR DISEASE BURDEN, TREATMENT GAPS REMAIN VAST

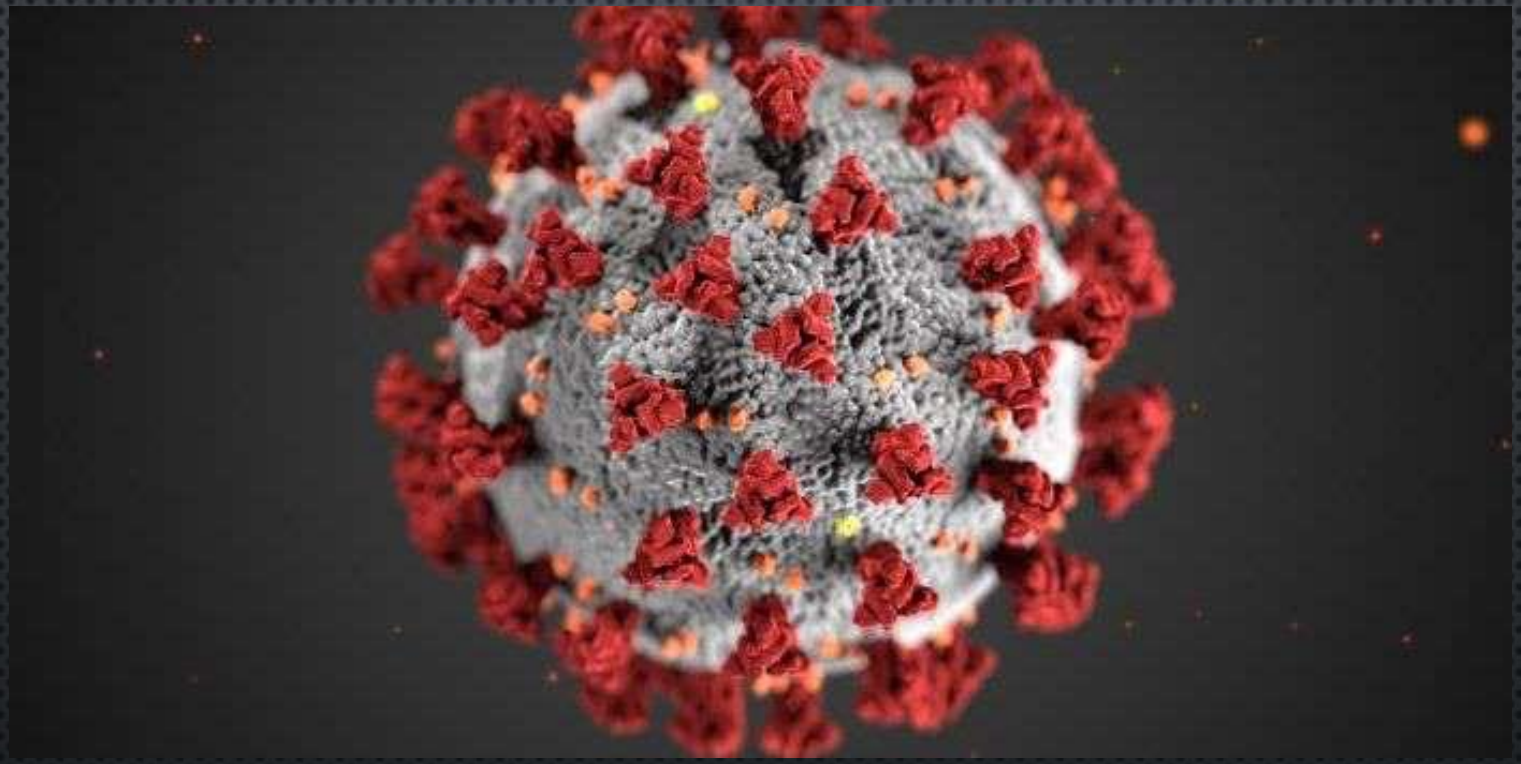
out of 19.7 Million people with substance use disorder- 92.3% are not receiving treatment



91.7% of the 8.5 million people with co-occurring AMI and Substance use disorder are not being treated for both (I.e., less than 9% are being appropriately treated)

PAST YEAR, 2017 NSDUH

CORONAVIRUS- GLOBAL PANDEMIC



On 4/9/2020- 777 Deaths in New York
Total US Death Toll: 16,736 Deaths; and 467,184 current infections

*Patients dying at home aren't counted, true death toll may be higher
(1125 died in home first 5 days of April 2020 vs 131 same time last year)

CHICKEN AND EGG PHENOMENON;

Patients with OUD experience trauma

↘

Leads to relapse

↓

Intensification of mental health disease

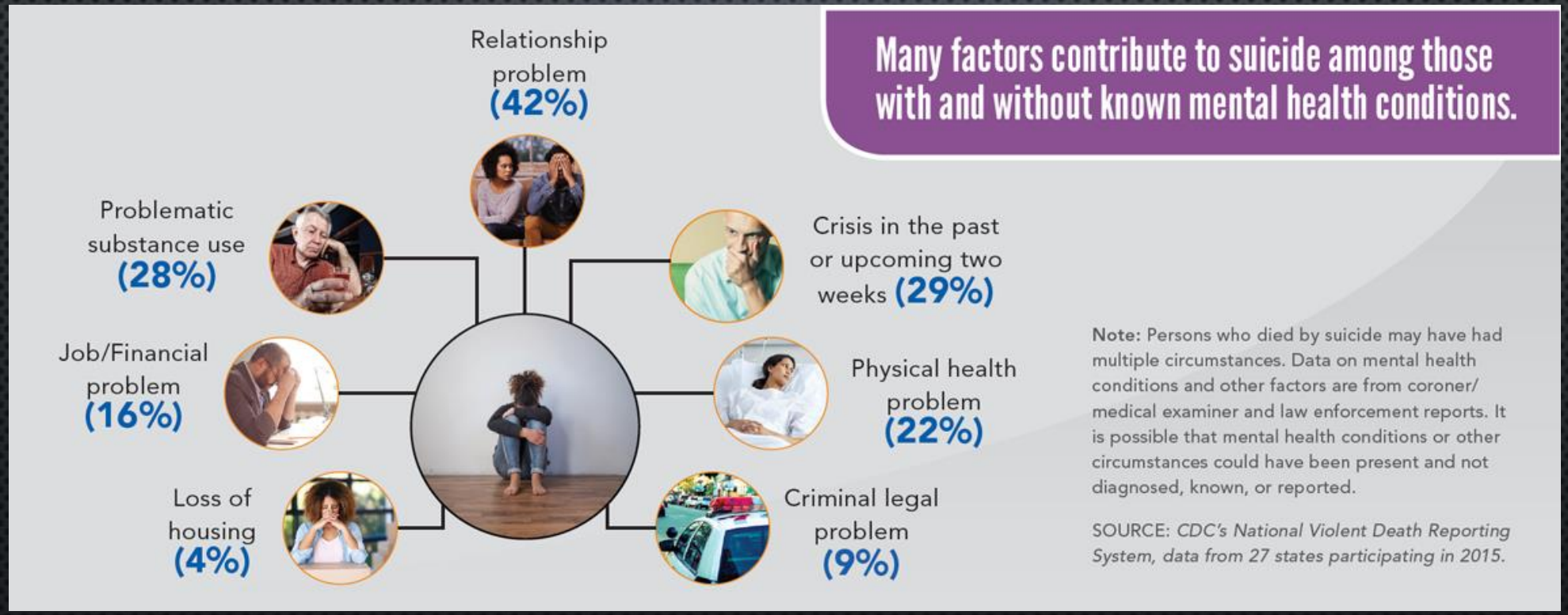
↑

Factors underlying development of OUD and related psychiatric disorders

- As with all chronic disease- interplay between Nature and nurture

MASLOW'S HIERARCHY

UNDERLYING CAUSES CITED IN CASES OF SUICIDE



"IT'S THE ECONOMY STUPID"

- Studies from the U.S. examining historical trends indicate that suicide rates increase during economic recessions marked by high unemployment rates, job losses, and economic instability and decrease during economic expansions and periods marked by low unemployment rates, particularly for working-age individuals 25 to 64 years old.(Luo 2011;Fowler 2015)

  Fowler KA, Gladden RM, Vagi KJ, Barnes J, Frazier L. Increase in suicides associated with home eviction and foreclosure during the US housing crisis: findings from 16; National Violent Death Reporting System States, 2005-2010. *Am J Public Health.* 2015;105(2):311-316

  Luo F, Florence CS, Quispe-Agnoli M, Ouyang L, Crosby AE. Impact of business cycles on US suicide rates, 1928-2007. *Am J Public Health.* 2011;101(6):1139-1146.

- Economic and financial strain, such as job loss, long periods of unemployment, reduced income, difficulty covering medical, food, and housing expenses, and even the anticipation of such financial stress may increase an individual's risk for suicide or may indirectly increase risk by exacerbating related physical and mental health problems (2007 Stack).

  Stack S, Wasserman I. Economic strain and suicide risk: a qualitative analysis. *Suicide Life Threat Behav.* 2007;37(1):103-112.

MASSIVE INEQUALITY
SECOND GILDED AGE

Chronic low level stress resulting from work

- Gig Economy
- People are not able to do as well as their parents in general for the first time
- Wage growth is not occurring for most americans
- Rise of "Alternative Fact" narrative and political fractionation that is reinforced by the filter bubble effect on internet search functions
  - One man's google search is another mans "fake news"
- Wage Inequality is continuing to grow (as above)
  - 62 wealthiest people in the world have the same amount of wealth as the bottom 50%
- Jobs have changed- there is no more longevity
  - Netflix : "We are not a family, we are a team (and can all be replaced)" culture deck

NETFLIX CULTURE SLIDE DECK

We're a *team*, not a family

We're like a **pro sports team**,
not a kid's recreational team

Netflix leaders
hire, develop and cut **smartly**,
so we have stars in every position

NETFLIX

The other people should get a generous severance now,
so we can open a slot to try to find a star for that role

The **Keeper Test** Managers Use:

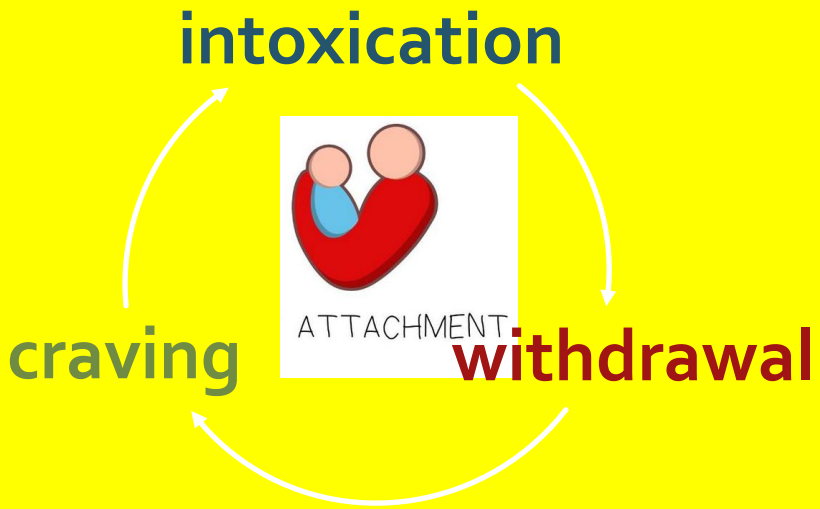
Which of my people,
if they told me they were leaving,
for a similar job at a peer company,
would I fight hard to keep at Netflix?

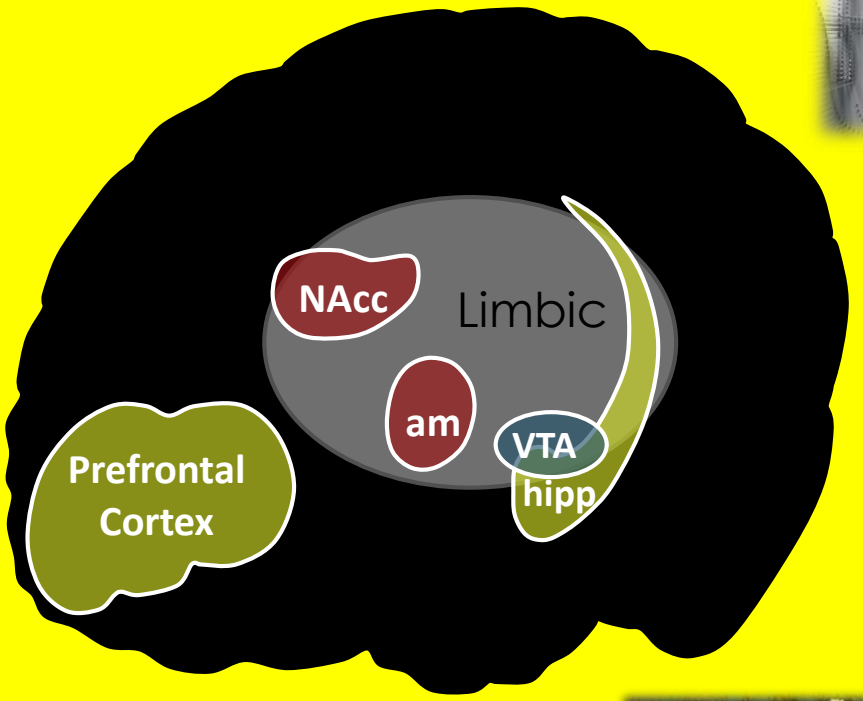
NETFLIX

LONELINESS

- Social buffering : the idea that if you have a solid social network, this can help you to maintain a healthy physiology
- Pennsylvania study : Roseto study showed people were healthier within a group and had 50% less heart attacks; the relevant factor found to be social cohesion and the ability to care for each other
- Cultural factors: the "Hispanic paradox"; longer life expectancy associated with having a strong social network

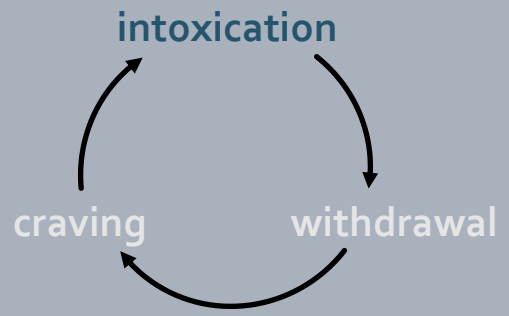
INITIAL REINFORCEMENTS

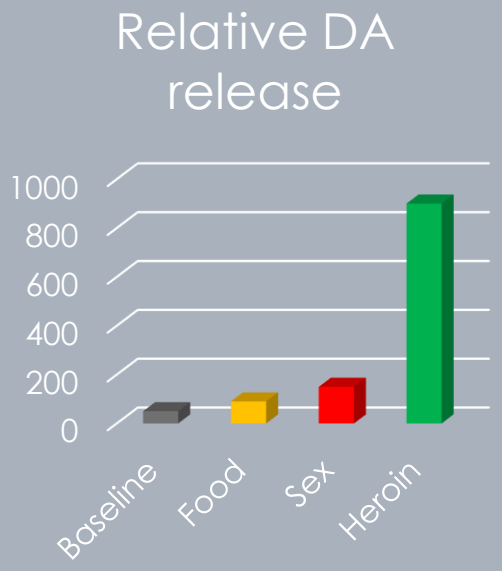


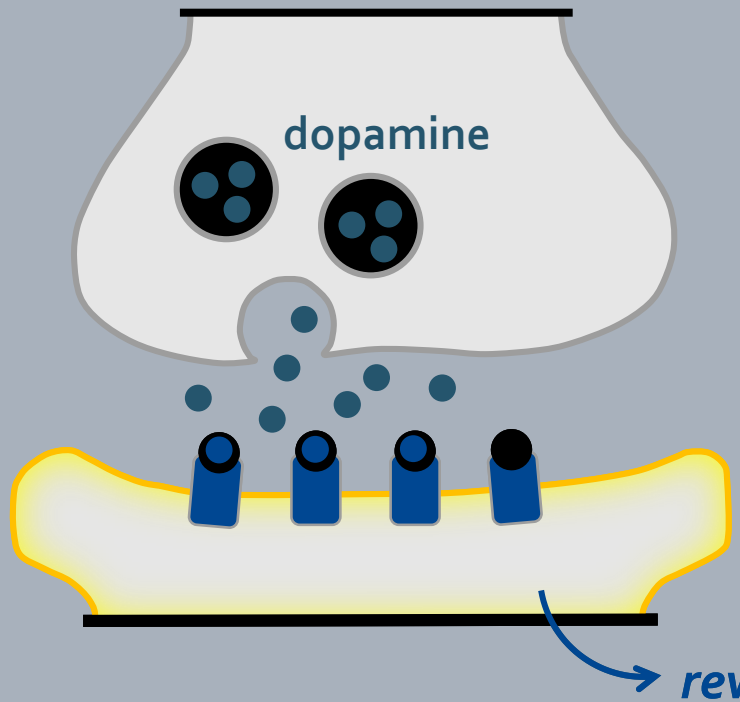


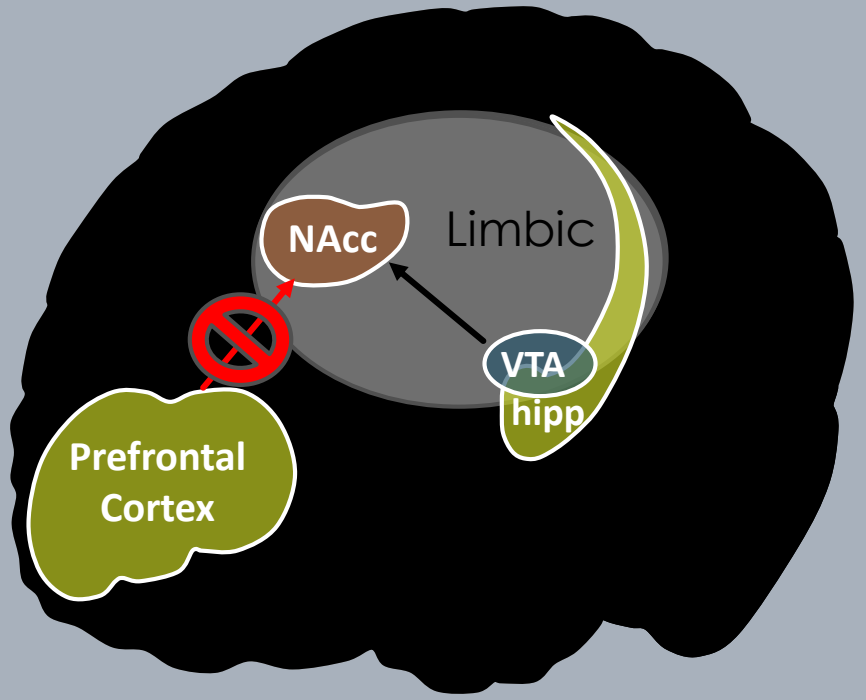
Adapted from: Koob GF, Lloyd GK, Mason BJ (Nat Rev Drug Discov 2009) and Koob GF, Volkow ND (Neuropsychopharmacology 2010)

INTOXICATION & REWARD









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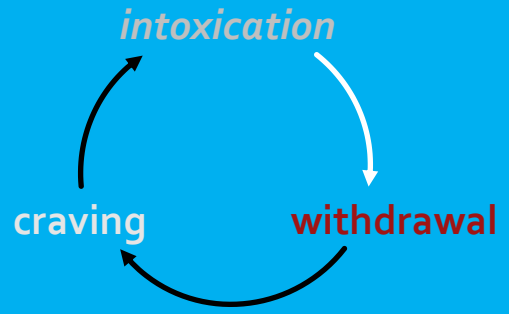
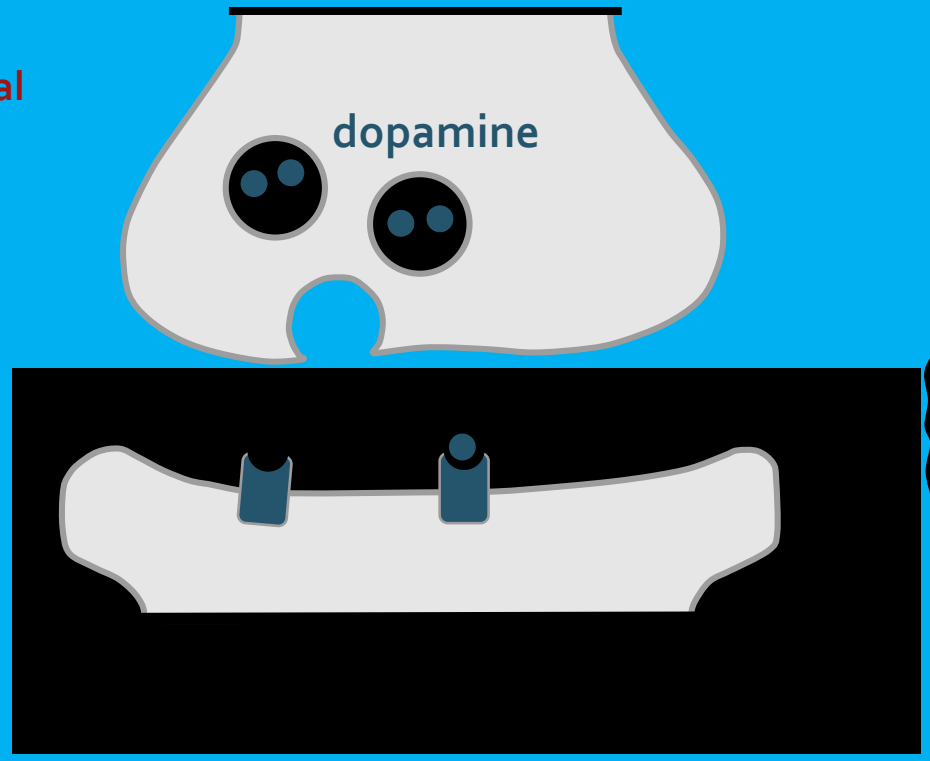
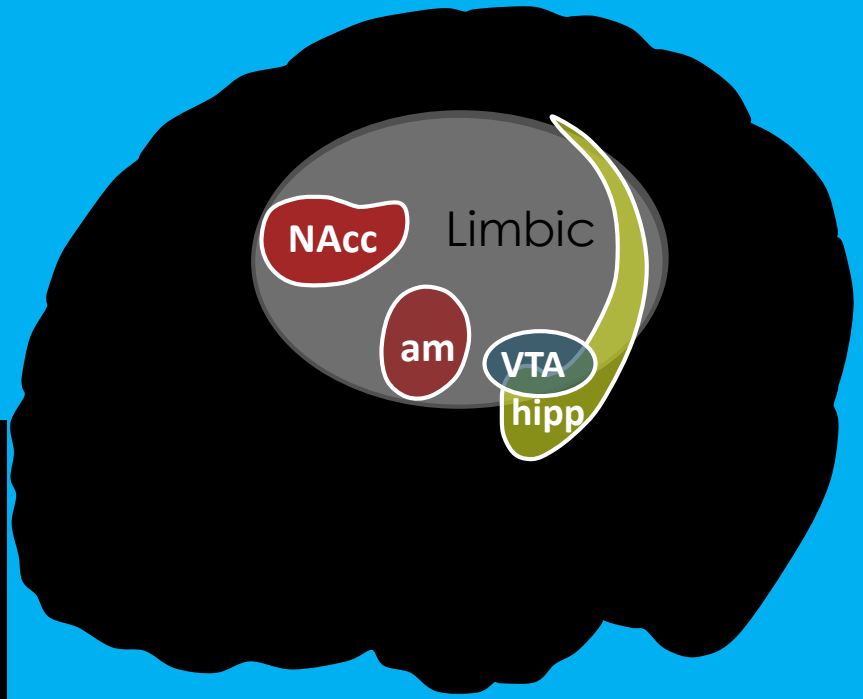
WITHDRAWAL & NEGATIVE AFFECT



↓GABA
↑Glutamate
↓ DA
↑ KAPPA
↑ NE/Epi





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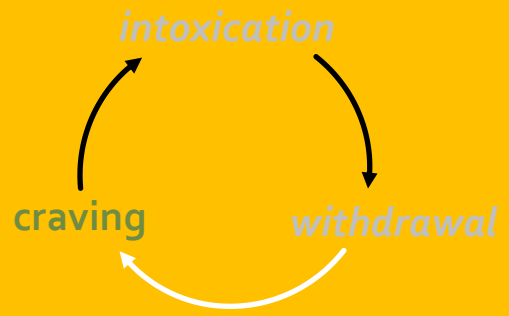
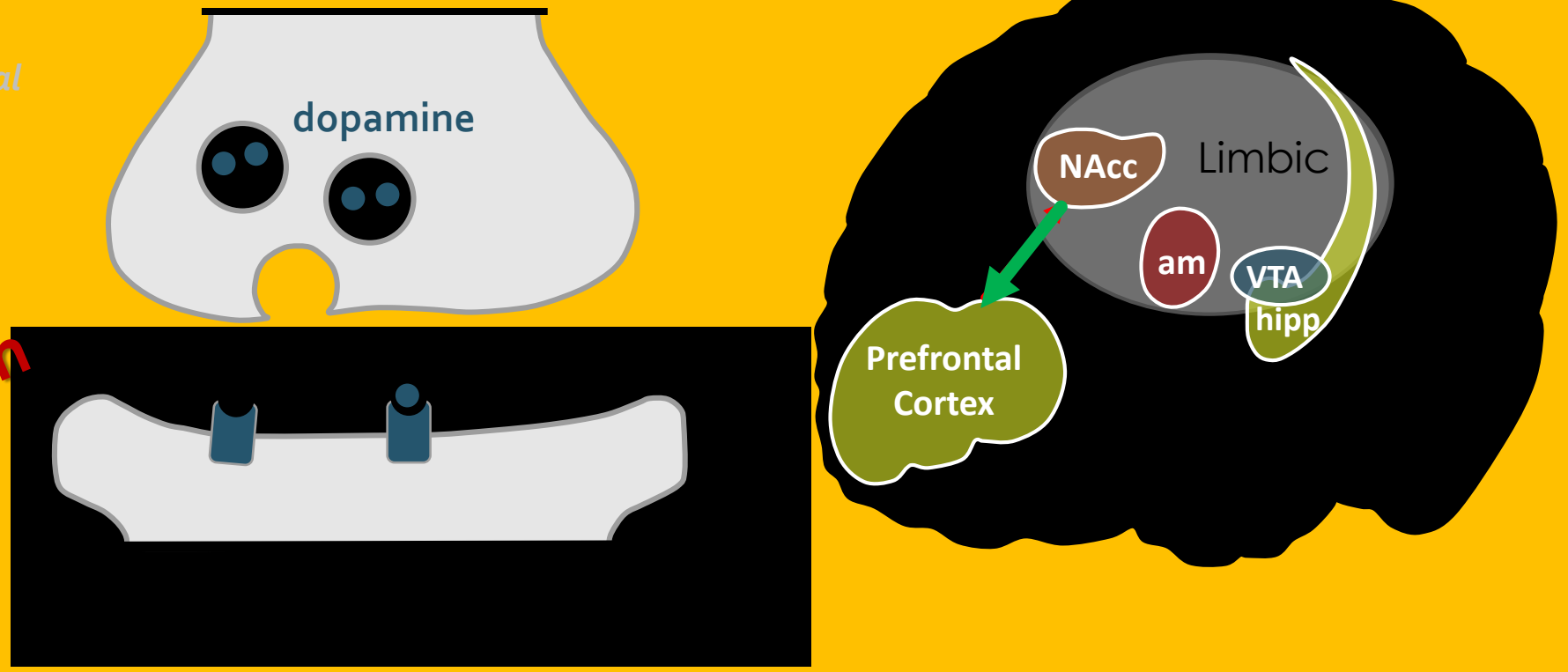
CRAVING / DRUG SEEKING





Similar regions show dysfunction in trauma

Adapted from: Koob GF, Lloyd GK, Mason BJ (Nat Rev Drug Discov 2009) and Koob GF, Volkow ND (Neuropsychopharmacology 2010)

Neuropsychiatric circuits

- SUDs can be conceptualized as a cycle of intoxication, withdrawal, and craving that is due to aberrant neural circuitry.
- "Reward circuit" (VTA, nucleus accumbens, striatum, and prefrontal cortex)
- "Stress circuit" (amygdala, hippocampus)
- "Cravings/preoccupation circuit" (prefrontal/OFC)

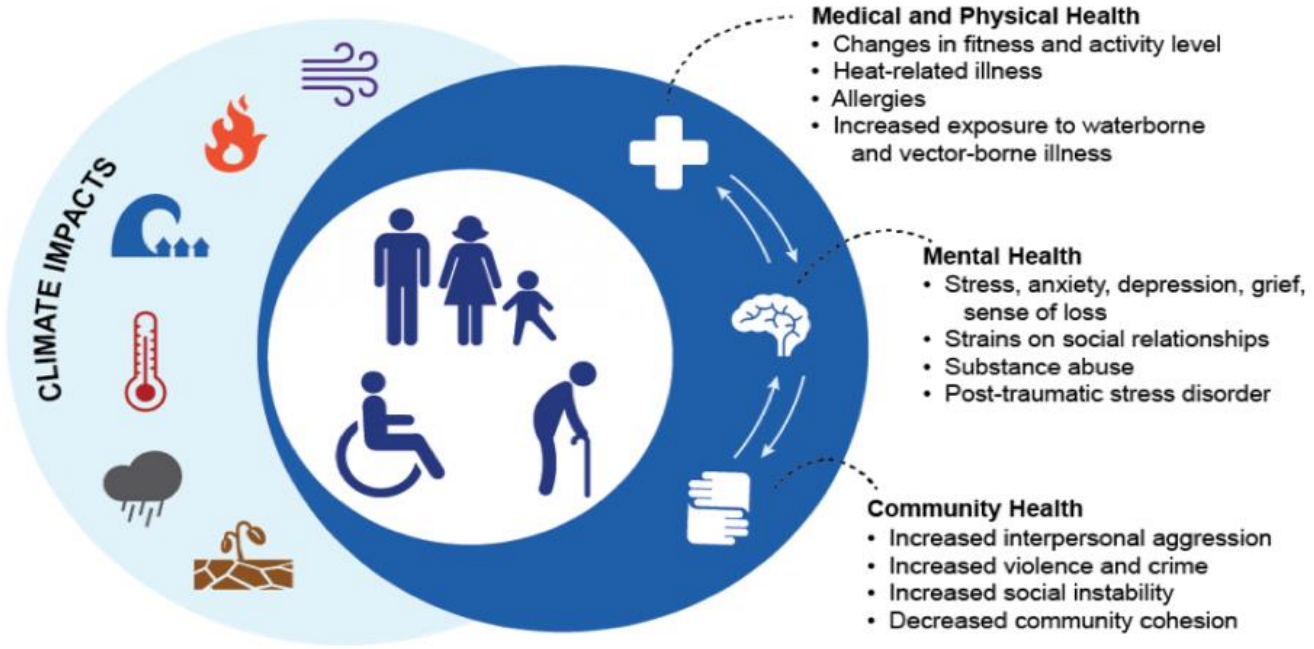
Opioid Use Disorder and Trauma

- High incidence of PTSD in individuals with Opioid Use Disorder (33%)[1]
- In those with a heroin use disorder, trauma exposure (92%) and lifetime PTSD (41%) were highly prevalent.[2]
- 4+ ACEs → 2-4x risk for AUD, and 7x risk for drug use[3]
- Reduced endorphins in chronic PTSD and decreased baseline dopamine also seen in those with trauma.[4]
- High CRH seen in trauma survivors increases vulnerability to stress disorders in response to new stressors - hyperarousal

[1]Mills K, Addiction. 2007;102(3):447-54. ,[2]Drug and Alcohol Dependence. 2005; 77(3):243-249, [3]Felitti V. Evidence from the Adverse Childhood Experiences Study 2004, [4]Fareed A, Journal of Addictive Diseases, 2013;32(2):168-79)

THE INSIDIOUS EFFECT OF SOCIAL MEDIA

An Illustration on How Climate Change Impacts Physical, Mental, and Community Health



At the center of the diagram are human figures representing adults, children, older adults, and people with disabilities. The left circle depicts climate impacts including air quality, wildfire, sea level rise and storm surge, heat storms, and drought. The right circle shows the three interconnected health domains that will be affected by climate impacts--Medical and Physical Health, Mental Health, and Community Health.

Image source: U.S. Global Change Research Program. 2016. The impacts of Climate Change on Human Health in the United States: A Scientific Assessment.

Already: national poll in 2017 showed 63% of Americans believe that climate change is impacting our mental health

According to a 2015 national survey by the Yale Project on Climate Change Communication and the George Mason University Center for Climate Change:

- More than one in three Americans think climate change will harm them
- More than one-half think it will harm people in the U.S.
- More than two-thirds think it will harm future generations
- ONLY 4% of people think we will be successful in doing something about it

CLINICAL EFFECTS OF PERFECTIONISM

- RESEARCH IN COLLEGE STUDENTS FOUND SELF-ORIENTED PERFECTIONISM IS POSITIVELY ASSOCIATED WITH CLINICAL DEPRESSION, ANOREXIA NERVOSA AND EARLY DEATH; BOTH SELF-ORIENTED AND SOCIALLY PRESCRIBED PERFECTIONISM ALSO CORRELATE WITH SUICIDAL IDEATION AND PREDICT INCREASES IN DEPRESSION OVER TIME (SMITH ET AL 2016 2017)

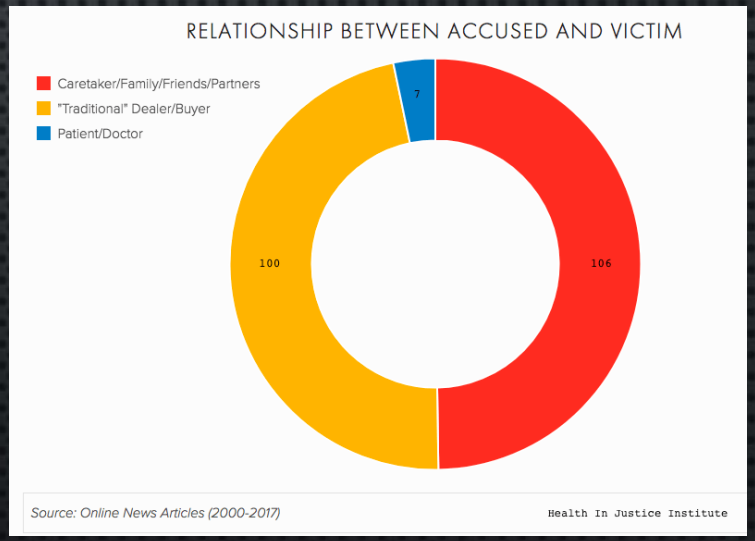
Other Factors Triggering Feelings of Trauma in Patients with OUD?

- Criminalization: War on Drugs
  - Trend towards prosecution for supplier of drug to be prosecuted for murder

-Losing loved ones to overdose death

Watching friends/lovers die in your arms

-Frightened of authority figures and barred from much of "typical life"




PRESCRIPTION MEDICATIONS & SURGERY
LIFESTYLE CHANGE

HOW DO WE SOLVE THIS CRISIS?

TRAUMA-INFORMED CARE (TIC)

- BOTH AN INTERVENTION AND AN ORGANIZATIONAL ORIENTATION THAT:
  - REALIZES HOW PREVALENT TRAUMA IS IN OUR PATIENT POPULATION
  - RECOGNIZES THE NEUROBIOLOGY OF TRAUMA AND HOW TRAUMA AFFECTS PATIENTS AND INFLUENCES THE COURSE OF ILLNESS AND TREATMENT
  - RESPONDS TO THE NEEDS OF PATIENTS WITH TRAUMA IN MANNER THAT FOCUSES ON STRENGTHS AND ACKNOWLEDGES ADAPTATION
- TIC NEEDS TO BEGIN FROM THE VERY FIRST PATIENT ENCOUNTER AND BE INCORPORATED INTO EVERY ASPECT OF CARE

SAFETY

HOPE

↓SNS

AUTONOMY

SAMHSA TIP Series 57. HHS Publication No. (SMA). 2014: 13-4801

Increase Access to Med-Assisted Treatment for Opioid Use Disorder

- Increased waivered buprenorphine providers and delivery of MAT in a real-time manner
  - Fewer than half of patients with opioid use disorder are being treated with MAT, which reduces the risk of death by over 50%
  - This is largely due to misinformation about "one drug being substituted for another"
- Improve access through emergency rooms after unintentional or intentional overdose
- Consider admission and treatment as if this is a STEMI, don't send the patient home with an appointment to have a cardiology assessment in 2 weeks
  - Often a typical ER course is: Reverse the patient with naloxone; no drug screen or other objective tests; consult social work and set the patient up for a Rule 25; no communication with patient's outpatient provider

ADMIT PATIENTS AFTER NONFATAL OVERDOSE

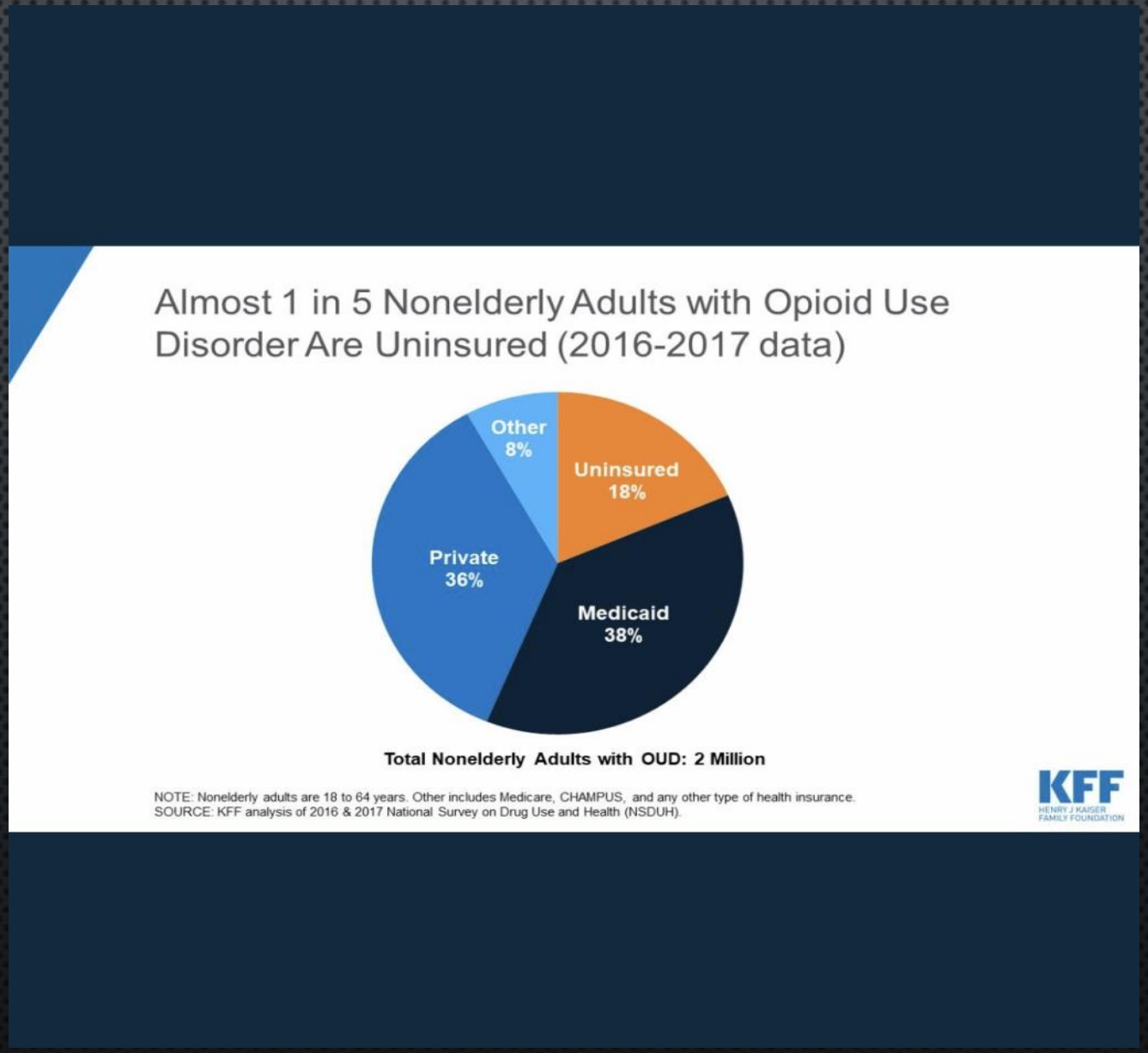
- EVERY OVERDOSE IS AN EMERGENCY, IN 1 YEAR, 5.5% MORTALITY RATE AFTER NONFATAL OVERDOSE FROM OPIOIDS REQUIRING A REVERSAL WITH NALOXONE IDENTIFIED IN THE ER (WEINER 2019)
  - HIGHEST RISK PERIOD IS IN THE FIRST 2 DAYS
  - MEDIAN AGE OF PATIENTS WHO DIED: 39 YEARS

ACES PREDICT OPIOID RELAPSE ; TRAUMA INFORMED CARE REDUCES THIS

- Relapses occurred in 54% of patients in a rural MAT clinic.
- 34% relapsed following their first visit
- For every Adverse Childhood Experience, the odds of relapse increased by 17%
- However, for every visit attended at this trauma-informed clinic, there was a 2% reduction in the odds of relapsing

Derefinko K, Addictive Behaviors. 2019. 96: 171-174

INCREASE INSURANCE COVERAGE



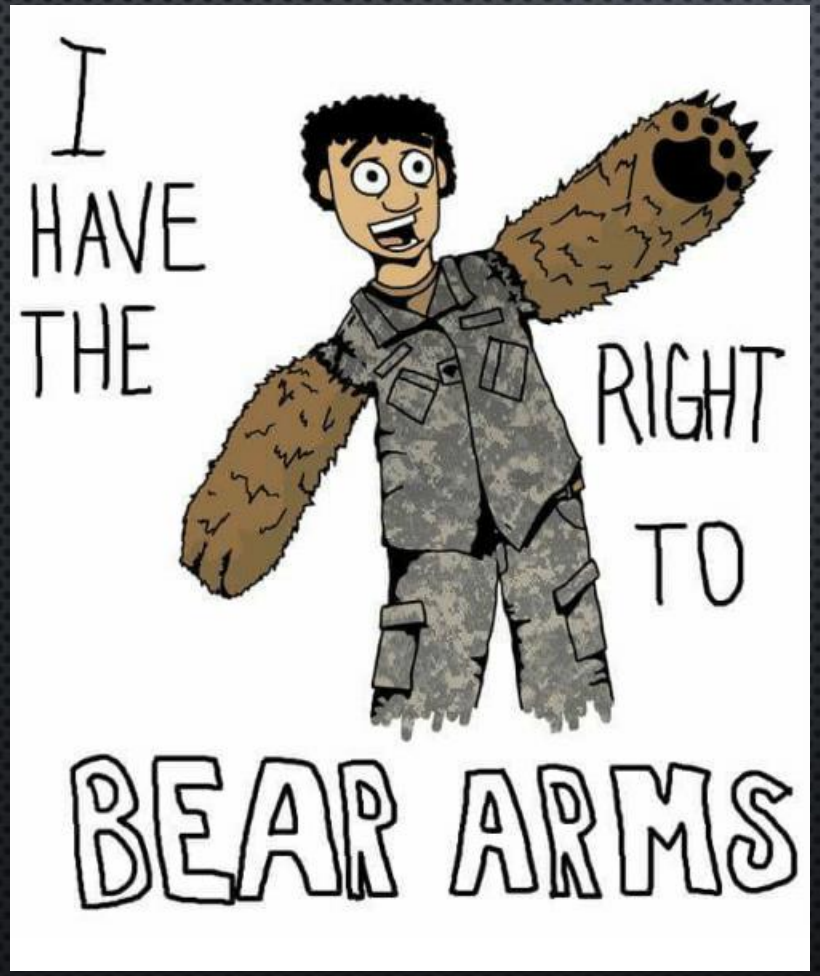
INCREASE ACCESS TO NALOXONE

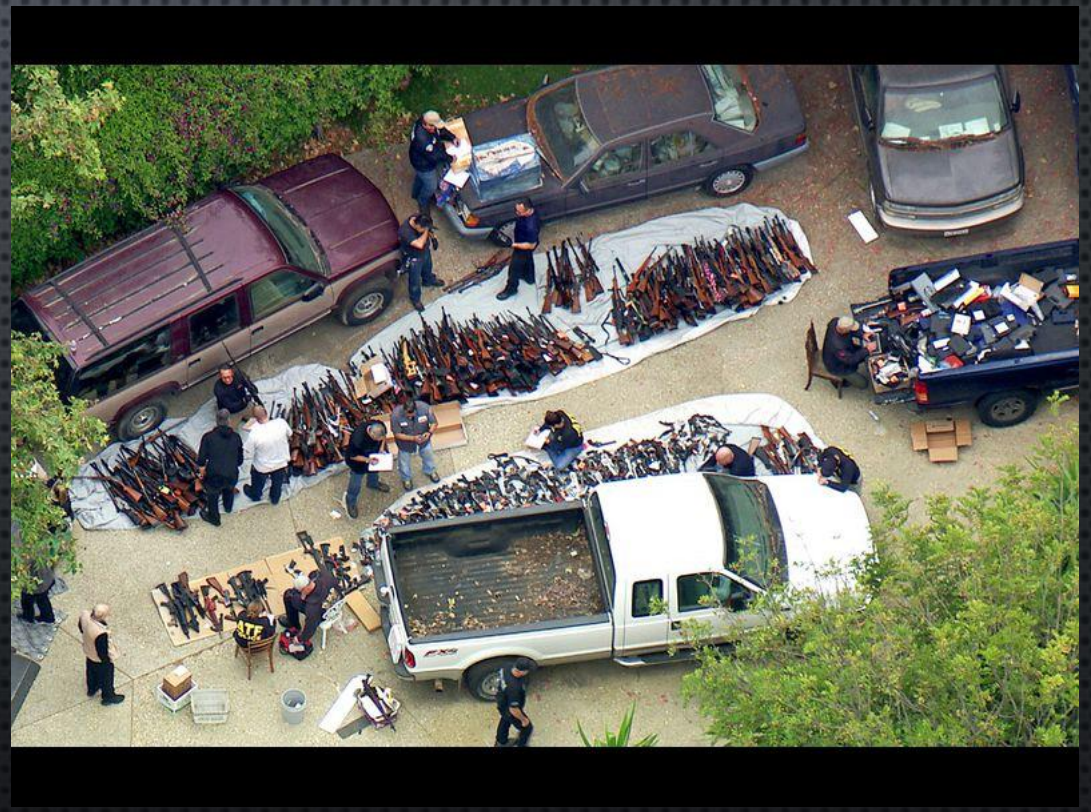
- Surgeon General recommends carrying Naloxone
- Difficult to predict who needs this
- Recent report from CDC showed only 1 in 69 patients prescribed opioids were prescribed naloxone (Schuchat 2019)
- Can be obtained OTC without a prescription in Minnesota

Appropriately staff clinics (NEPRASH 2017 JAMA)

- Doctors: Cross-sectional study done on primary care appointments, primarily in 2017 for patients with a new painful condition, who had not yet received opioids in the past year
- Rates of prescribing opioids were compared with prescribing nonopioids (NSAIDs, etc) and physical therapy, within the same physician
- 678,319 primary care appointments on 642,262 patients (61.1 % women) and 5603 different physicians in primary care were analyzed
- **The likelihood that an appointment resulted in an opioid prescription increased by 33% as the workday progressed (1st to 3rd appointment 4.0% and 19th to 21st appt 5.1%) and by 17% as appointments ran behind schedule (4.4% at 0-9 min late and 5.2% at >60 min late)**
  - Prescription of physical therapy and NSAID's did not display similar patterns.

REDUCE ACCESS TO FIREARMS





ISN'T THIS POLITICALLY CHARGED?

- NOT REALLY- THE VA EVEN SAYS TO ASSESS AND RESTRICT FIREARM ACCESS MULTIPLE PLACES IN THIS IN THE ALGORITHMS TO FOR MANAGING VETERAN SUICIDE RISK RECENTLY RELEASED FROM 2019 (ANNALS OF INTERNAL MEDICINE, SALL 2019)
- IF RESTRICTING ACCESS IS REQUIRED FOR PEOPLE TRAINED TO USE FIREARMS IN COMBAT, THIS IS OBVIOUSLY EVEN MORE IMPORTANT FOR CIVILIANS AND FAMILIES
- AAP MAKES IT CLEAR THAT HAVING GUNS IN HOMES IS DANGEROUS FOR CHILDREN AND CAUSES RISKS
- AS CLINICIANS, IT IS OUR JOB TO TEACH OUR PATIENTS THESE FACTS, AND CUT THROUGH PROPAGANDA

- Key results include the following:
- The number of Veteran suicides exceeded 6,000 each year from 2008 to 2017.
- Among U.S. adults, the average number of suicides per day rose from 86.6 in 2005 to 124.4 in 2017. These numbers included 15.9 Veteran suicides per day in 2005 and 16.8 in 2017.
- In 2017, the suicide rate for Veterans was 1.5 times the rate for non-Veteran adults, after adjusting for population differences in age and sex.
- Firearms were the method of suicide in 70.7% of male Veteran suicide deaths and 43.2% of female Veteran suicide deaths in 2017.
- In addition to the aforementioned Veteran suicides, there were 919 suicides among never federally activated former National Guard and Reserve members in 2017, an average 2.5 suicide deaths per day.
- Suicides now exceed combat deaths for causing deaths in service members

- Any questions?
- Email me at eabrunner@healtheast.org
- Twitter: @DrEmilyBrunner
- Thanks to Steve Delisi, MD, who provided feedback on this lecture, neurobiology slides, has been a great mentor, and thanks also to the many other docs who have taught me along the way