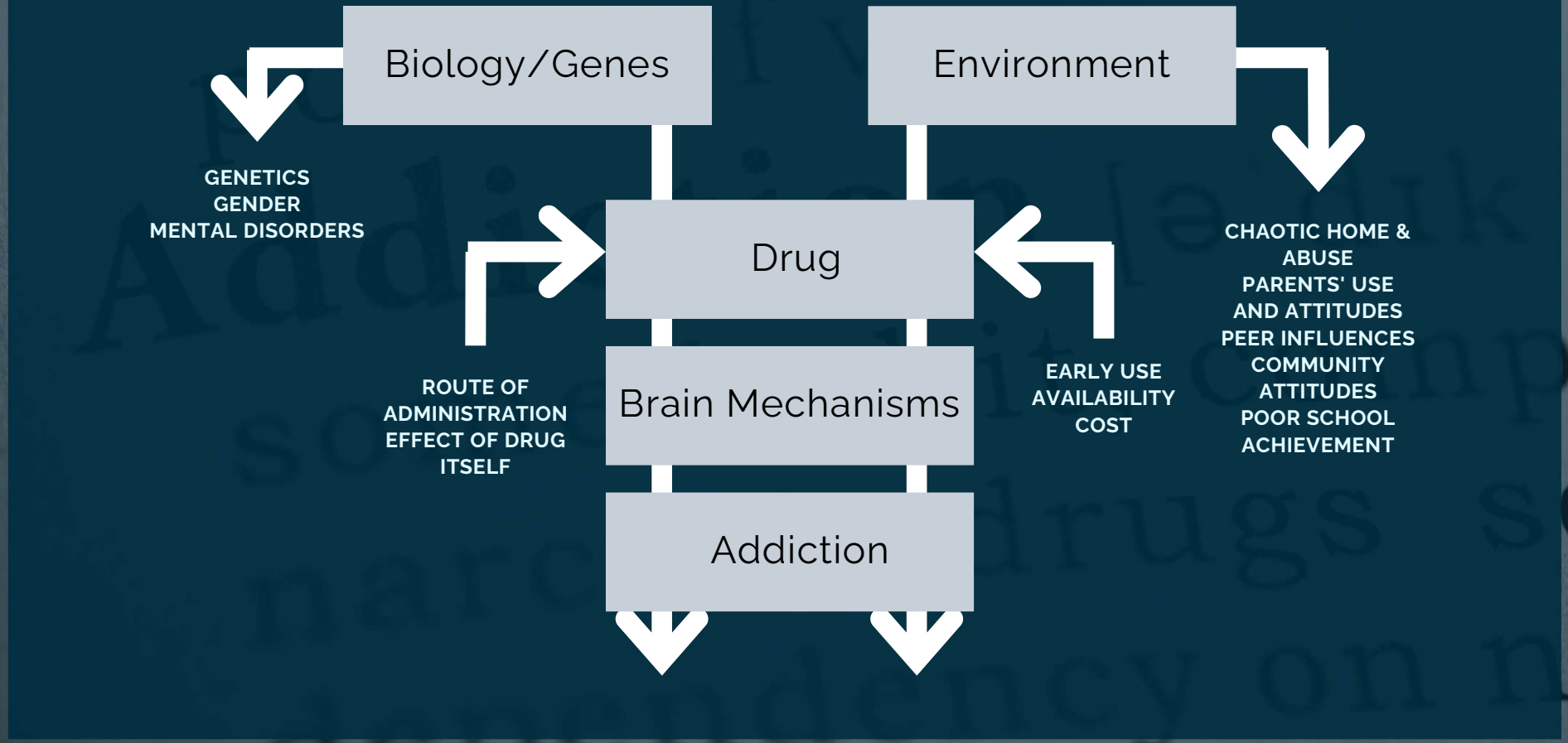
PRESENTED BY DR. KENNETH ROBINSON, ED.D.

THE SCIENCE AND EFFECTS OF DRUGS AND ALCOHOL


Biology/Genes
Environment
GENETICS
GENDER
MENTAL DISORDERS
Drug
CHAOTIC HOME & ABUSE
PARENTS' USE AND ATTITUDES
PEER INFLUENCES
COMMUNITY ATTITUDES
POOR SCHOOL ACHIEVEMENT
ROUTE OF ADMINISTRATION
EFFECT OF DRUG ITSELF
Brain Mechanisms
EARLY USE
AVAILABILITY
COST
Addiction

WHAT IS ADDICTION?

- A STATE IN WHICH AN ORGANISM ENGAGES IN A COMPULSIVE BEHAVIOR
  - Behavior is reinforcing (rewarding or pleasurable)
  - Loss of control in limiting intake

Addiction is a developmental disease - typically beginning in childhood or adolescence

One of the brain areas still maturing during adolescence is the prefrontal cortex - the part of the brain that enables us to assess situations, make sound
decisions, and keep our emotions and desires under control.

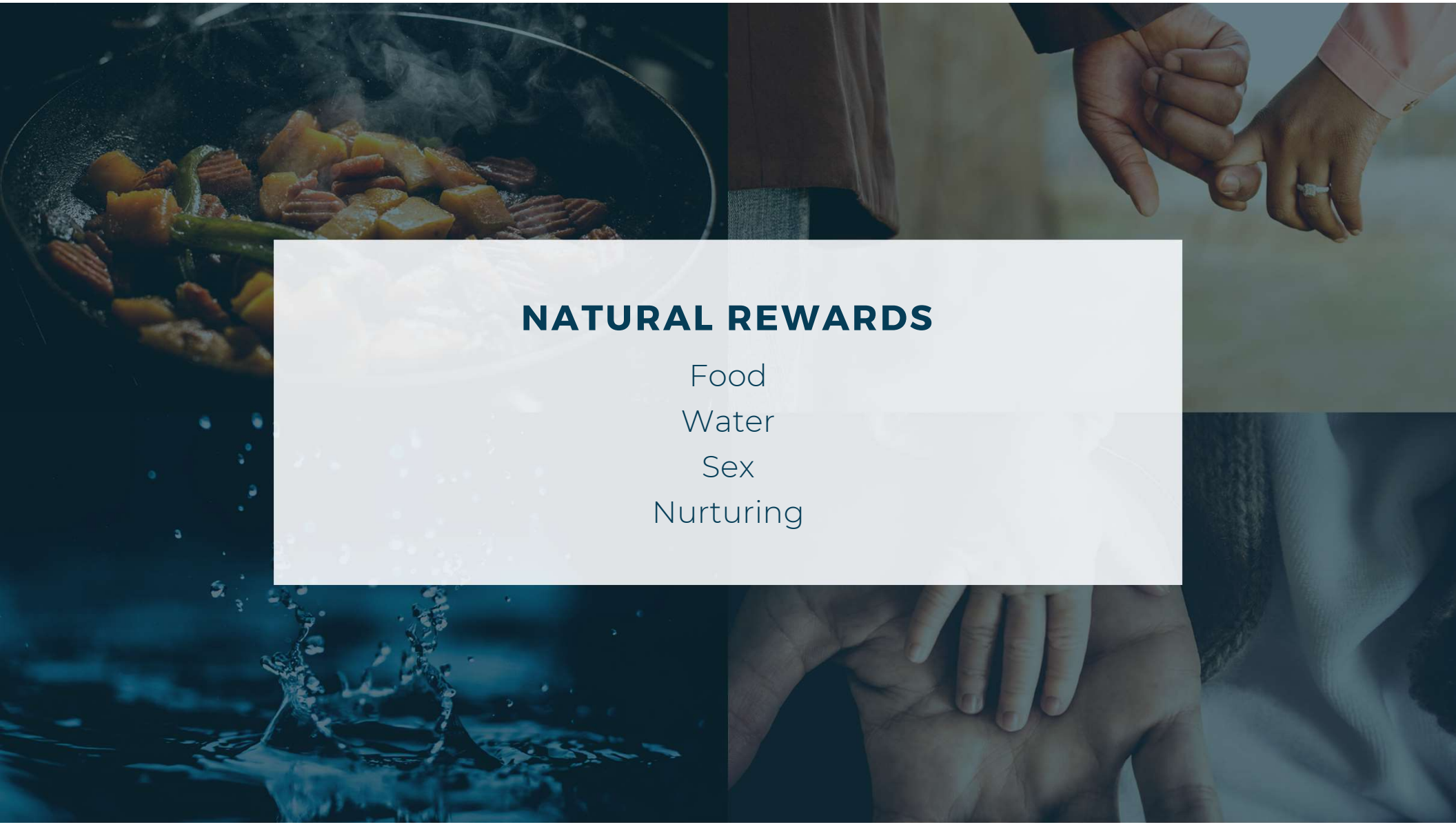
The fact that this critical part of an adolescent's brain is still a work-in-progress puts them at increased risk for poor decisions (such as trying drugs or continued abuse).

NEUROTRANSMITTERS

- Serotonin
  - Affects sleep and dreams - is thought to be how LSD works and is increased by the use of cocaine and amphetamine
- Dopamine
  - Affects motor movement, is involved in pleasure and is related to psychosis
- Norepinephrine
  - Affects heart rate, blood pressure, sweating, dilates pupils, lungs and constricts blood vessels

NEUROTRANSMITTERS

- GABA (gamma amino butyric acid)
  - Inhibits cells from firing, much of the following drugs gain their effects through this neurotransmitter
    - alcohol,
    - barbiturates,
    - benzodiazepines
- Acetylcholine (ach)
  - It is at every axon - nicotine tends to work through this neurotransmitter
- Endorphins
  - Body’s natural pain killers



NATURAL REWARDS

Food

Water

Sex

Nurturing

Mental Illness & Substance Use Disorders in America in the Past Year:

Among Adults Aged 18+

PAST YEAR, 2020 NSDUH, 18

Among those with a substance use disorder:
4 IN 9 (44.4% or 17.2M) struggled with illicit drugs
7 IN 10 (71.4% or 27.6M) struggled with alcohol use
2 IN 13 (15.8% or 6.1M) struggled with illicit drugs and alcohol

Among those with a mental illness:
1 IN 4 (26.9% or 14.2M) had a serious mental illness

15.4%
(38.7 MILLION)
People aged 18 or older had a substance use disorder (SUD)

6.7%
(17.0 MILLION)
People 18 or older had BOTH an SUD and a mental illness

21.0%
(52.9 MILLION)
People aged 18 or older had a mental illness

In 2020, **29.3% (73.8M)** Americans had a mental illness and/or substance use disorder.

SAMHSA
Substance Abuse and Mental Health Services Administration

Impulsive-Antisocial Personality Traits Linked to a Hypersensitive Brain Reward System

Since psychopathic individuals are at increased risk for developing substance use problems, researchers decided to investigate possible links between the brain's reward system (activated by abused substances and natural reward), and a behavioral trait (impulsive/antisociality) characteristic of psychopathy. Researchers used two different technologies to measure the brain's reward response.

Source: J Buckholtz, et al. Nature Neuroscience 2010

Impulsive-Antisocial Personality Traits Linked to a Hypersensitive Brain Reward System

In the first experiment, positron emission tomography (PET) was used to image the brain's dopamine response in subjects who received a low oral dose of amphetamine. Dopamine is a brain chemical associated with reward and motivation.

In the second experiment, the same subjects participated in a game, in which they could make (or lose) money while their brains were being scanned using functional magnetic resonance imaging (fMRI).

Source: J Buckholtz, et al. Nature Neuroscience 2010

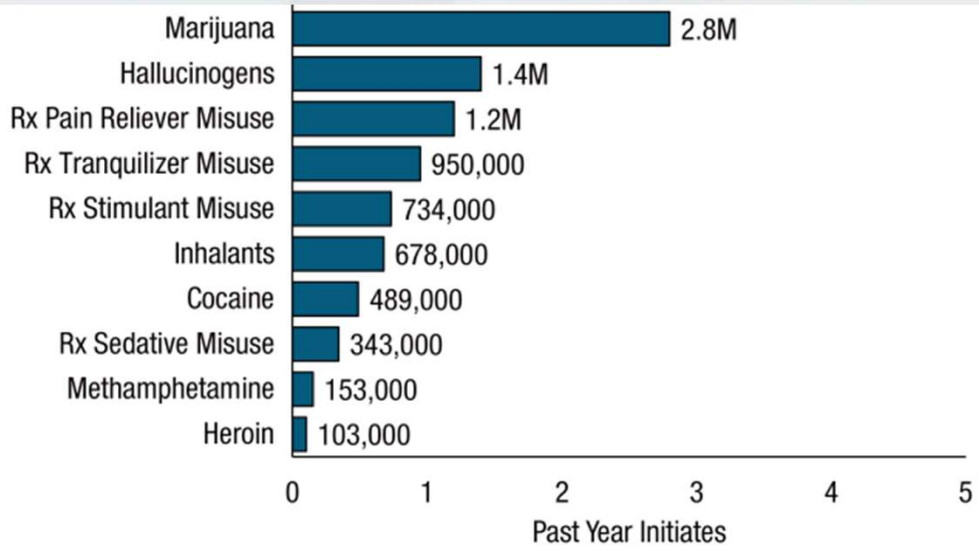
Impulsive-Antisocial Personality Traits Linked to a Hypersensitive Brain Reward System

The traits analyzed in this study have been previously shown to predict antisocial behavior and substance abuse in both incarcerated and community samples.

"Because of these exaggerated dopamine responses, individuals with a latent psychopathic trait may become focused on a chance to get a reward, and less able to shift their attention until they get what they're after. This pattern, along with other traits, could develop into psychopathic personality disorder."

Source: J Buckholtz, et al. Nature Neuroscience 2010

Illicit Drug Use: Marijuana Most Used Drug

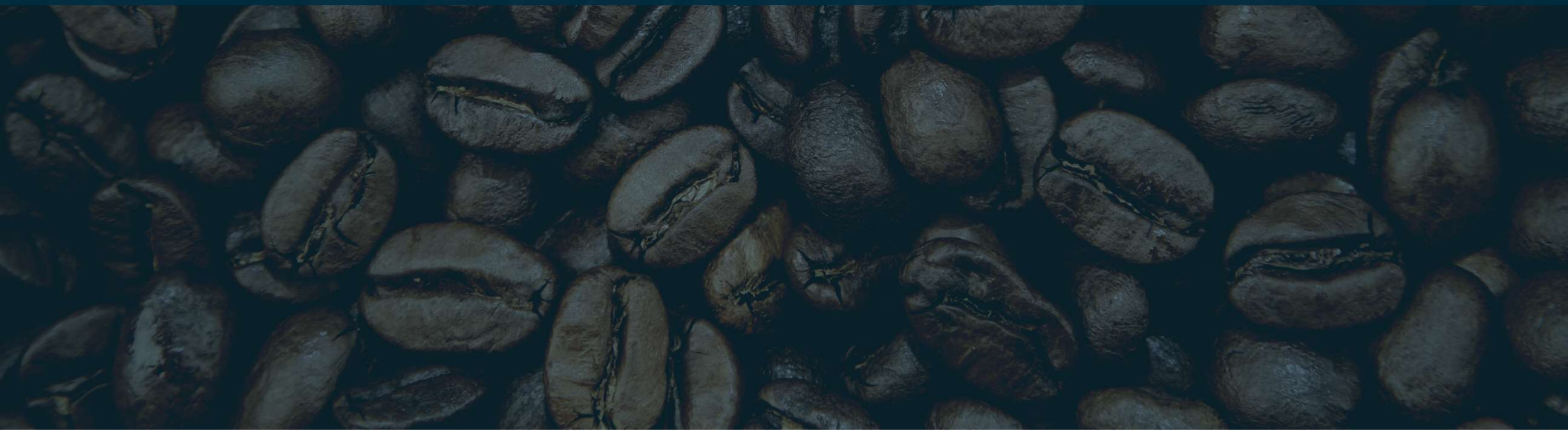


Rx = prescription.

Note: Estimates for prescription pain relievers, prescription tranquilizers, prescription stimulants, and prescription sedatives are for the initiation of misuse.

SAMHSA
Substance Abuse and Mental Health Services Administration

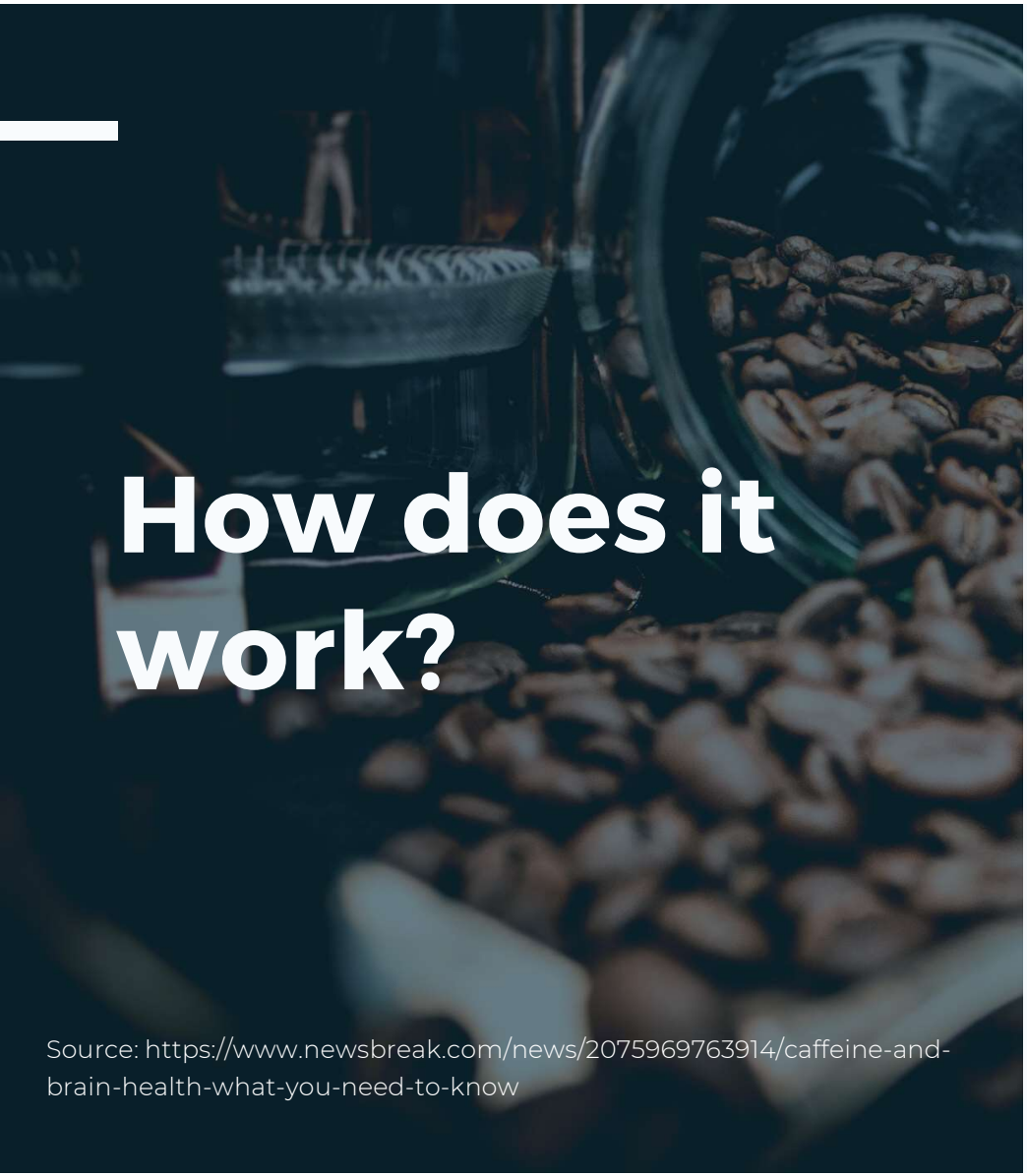
Caffeine



Caffeine

- Found naturally in tea and coffee
- Added to energy drinks, soda, some snack foods and medications
- More than 8 out of 10 adults in the U.S. consume caffeine in some form

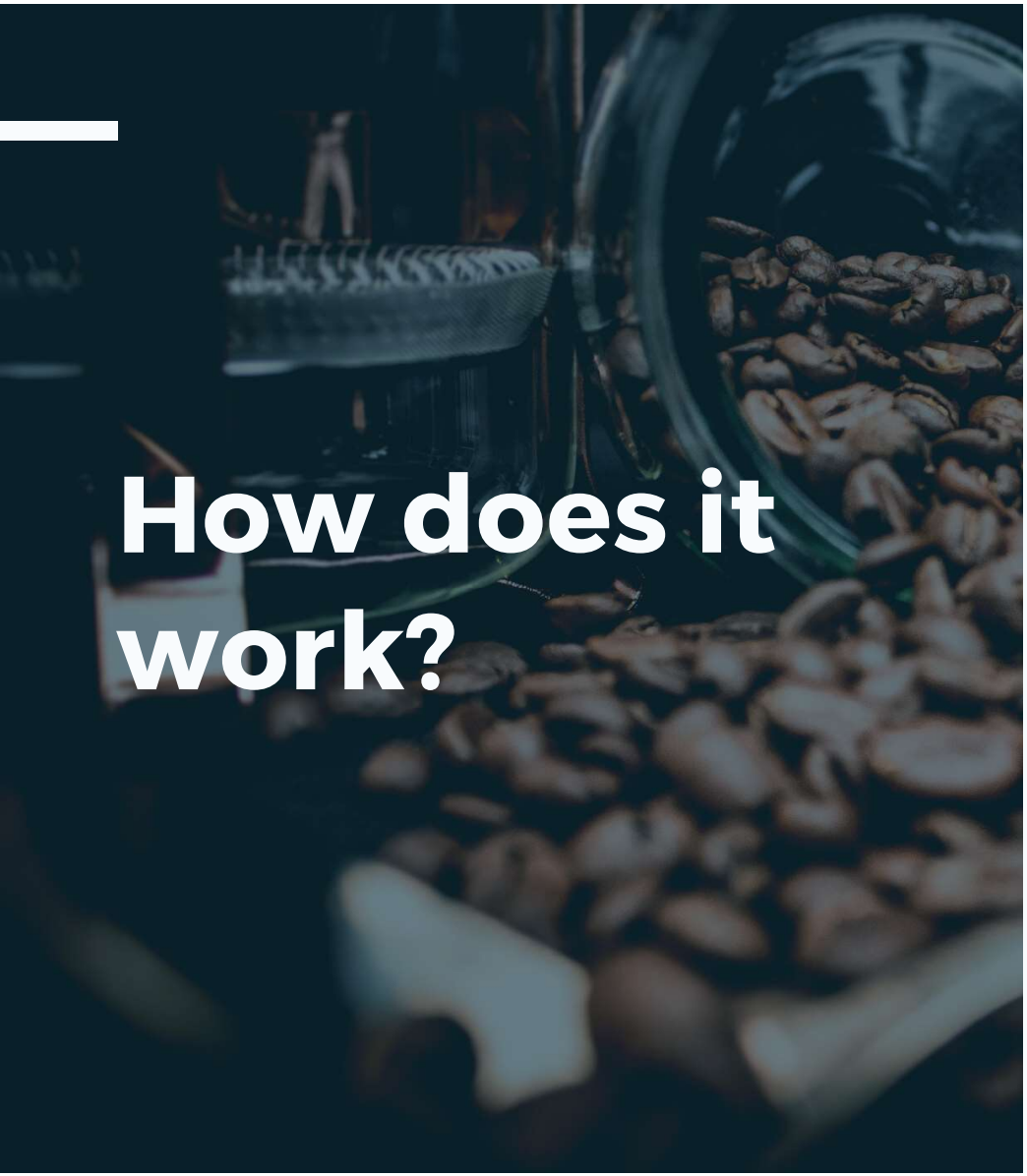
Source: https://www.newsbreak.com/news/2075969763914/caffeine-and-brain-health-what-you-need-to-know



How does it work?

Source: https://www.newsbreak.com/news/2075969763914/caffeine-and-brain-health-what-you-need-to-know

- Your body naturally produces a chemical called adenosine – it builds up in your body during the day
- Adenosine is what makes you feel sleepy at the end of the day. Its buildup signals your brain it's time to rest.
- Caffeine blocks adenosine from working on brain cells
- Regularly consuming caffeine causes your body to produce more adenosine, which causes you to need more caffeine over time to get the same wakeful feeling
- The extra adenosine in your body is what can cause feelings of withdrawal if you suddenly stop caffeine
- Withdrawal symptoms often include headaches and increased sleepiness



How does it work?

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EFFECTS OF CAFFEINE

- Caffeine interacts with other chemicals in the brain, which can lead to feeling “overcaffeinated”

  Symptoms can include racing pulse, nausea and anxiety

- Children, teens, and women who are pregnant or breastfeeding are often advised to stay away from caffeine, too

- Avoid caffeine if you have acid reflux, trouble sleeping, high blood pressure or heart problems

- Don’t mix caffeine with alcohol – the caffeine can block the brain from feeling the depressant effects of alcohol, leading someone to drink more than they normally would, increasing impairment

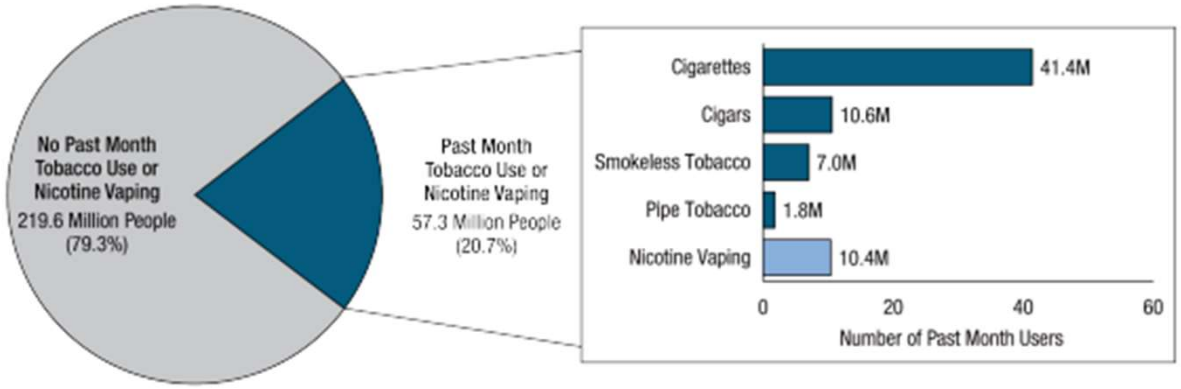
Nicotine & Tobacco

Factors Associated with Youth Tobacco Use

- low levels of academic achievement,
- low self-image or self-esteem,
- exposure to tobacco advertising,
- aggressive behavior (e.g., fighting, carrying weapons)
- high-risk sexual behavior,
- use of alcohol,
- use of other drugs

Source: Campaign for Tobacco-Free Kids, 2009

Past Month Tobacco Use and Nicotine Vaping: Among People Aged 12 or Older; 2020



Note: The estimated numbers of current users of different tobacco products or nicotine vaping are not mutually exclusive because people could have used more than one type of tobacco product or used tobacco products and vaped nicotine in the past month.

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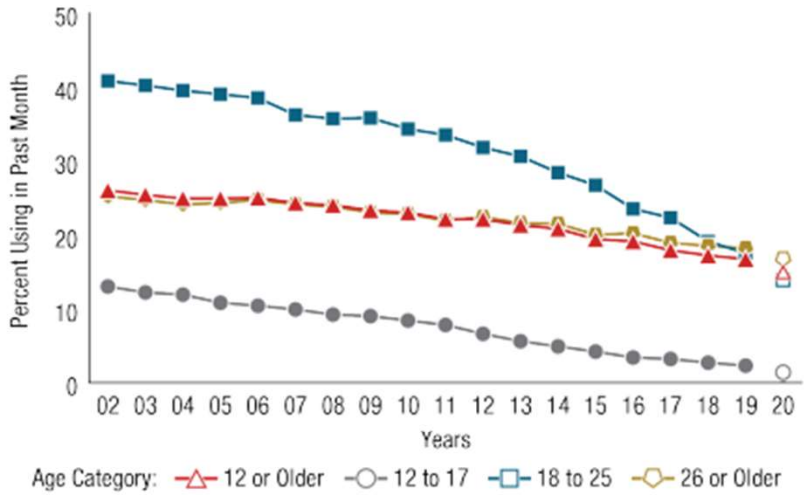
Past Month Cigarette Use: Among People Aged 12 or Older; 2002-2020



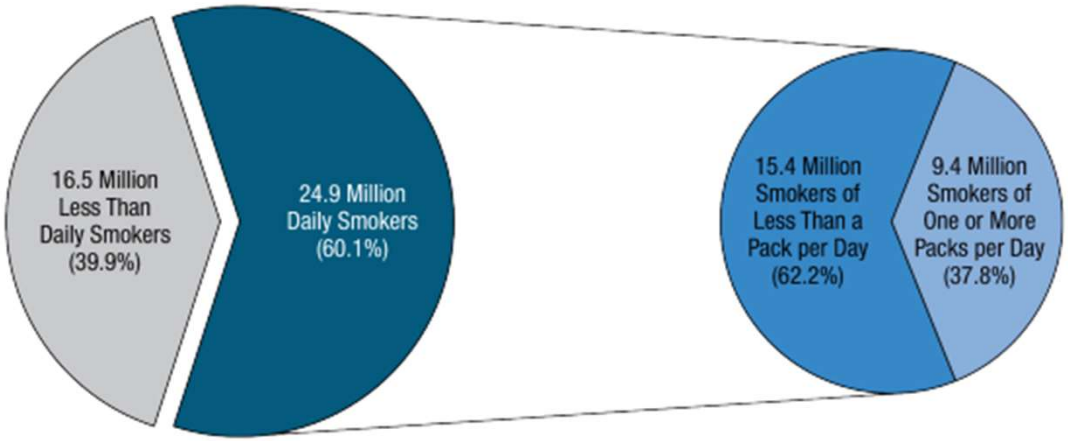
Age	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
12 or Older	26.0	25.4	24.9	24.9	25.0	24.3	24.0	23.3	23.0	22.1	22.1	21.3	20.8	19.4	19.1	17.9	17.2	16.7	*15.0*
12 to 17	13.0	12.2	11.9	10.8	10.4	9.9	9.2	9.0	8.4	7.8	6.6	5.6	4.9	4.2	3.4	3.2	2.7	2.3	*1.4*
18 to 25	40.8	40.2	39.5	39.0	38.5	36.2	35.7	35.8	34.4	33.5	31.8	30.6	28.4	26.7	23.5	22.3	19.1	17.5	*13.9*
26 or Older	25.2	24.7	24.1	24.3	24.7	24.1	23.8	23.0	22.8	21.9	22.4	21.6	21.5	20.0	20.2	18.9	18.5	18.2	*16.7*

Note: There is no connecting line between 2019 and 2020 to indicate caution should be used when comparing estimates between 2020 and prior years because of methodological changes for 2020. Due to these changes, significance testing between 2020 and prior years was not performed.

Note: The estimate in 2020 is italicized to indicate caution should be used when comparing estimates between 2020 and prior years because of methodological changes for 2020. Due to these changes, significance testing between 2020 and prior years was not performed.

SAMHSA
Substance Abuse and Mental Health Services Administration

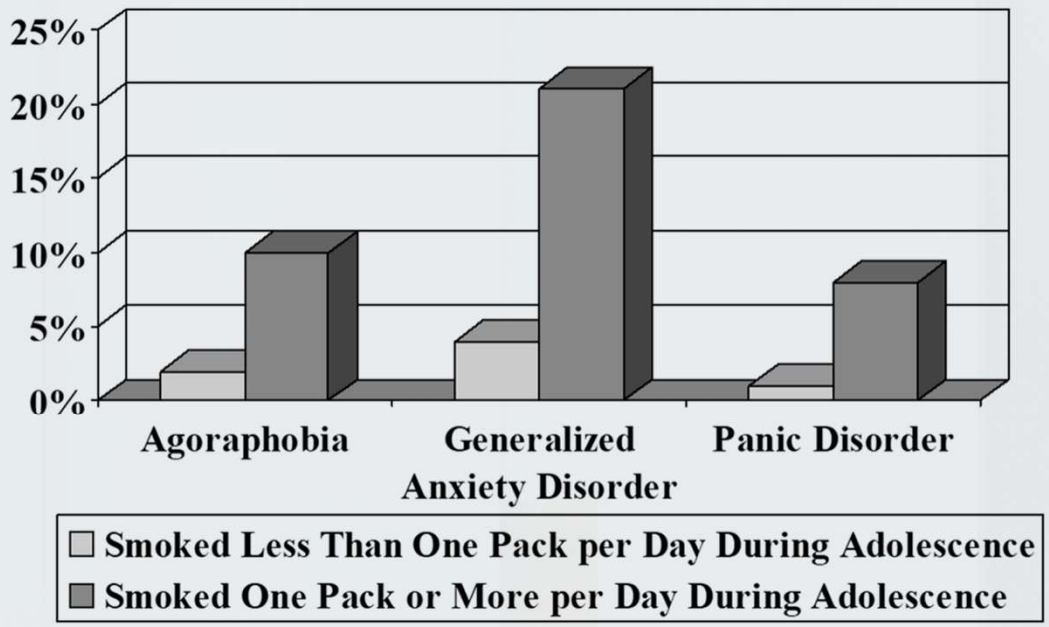
Daily Cigarette Use: Among Past Month Cigarette Smokers Aged 12 or Older; Smoking of One or More Packs of Cigarettes per Day: Among Current Daily Smokers; 2020



Note: Current daily smokers with unknown data about the number of cigarettes smoked per day were excluded from the pie chart on the right.

SAMHSA
Substance Abuse and Mental Health Services Administration

Percentage of Young Adults With Anxiety Disorders, by Amount of Cigarettes Smoked During Adolescence



Source:
Adapted by CESAR from Johnson J.G., Cohen P., Pine D.S., Klein D.F., Kasen S., Brook J.S., "Association Between Cigarette Smoking and Anxiety Disorders During Adolescence and Early Adulthood," Journal of the American Medical Association 284(18):2348-2351, 2000.

Nicotine Increases Risk of ADD

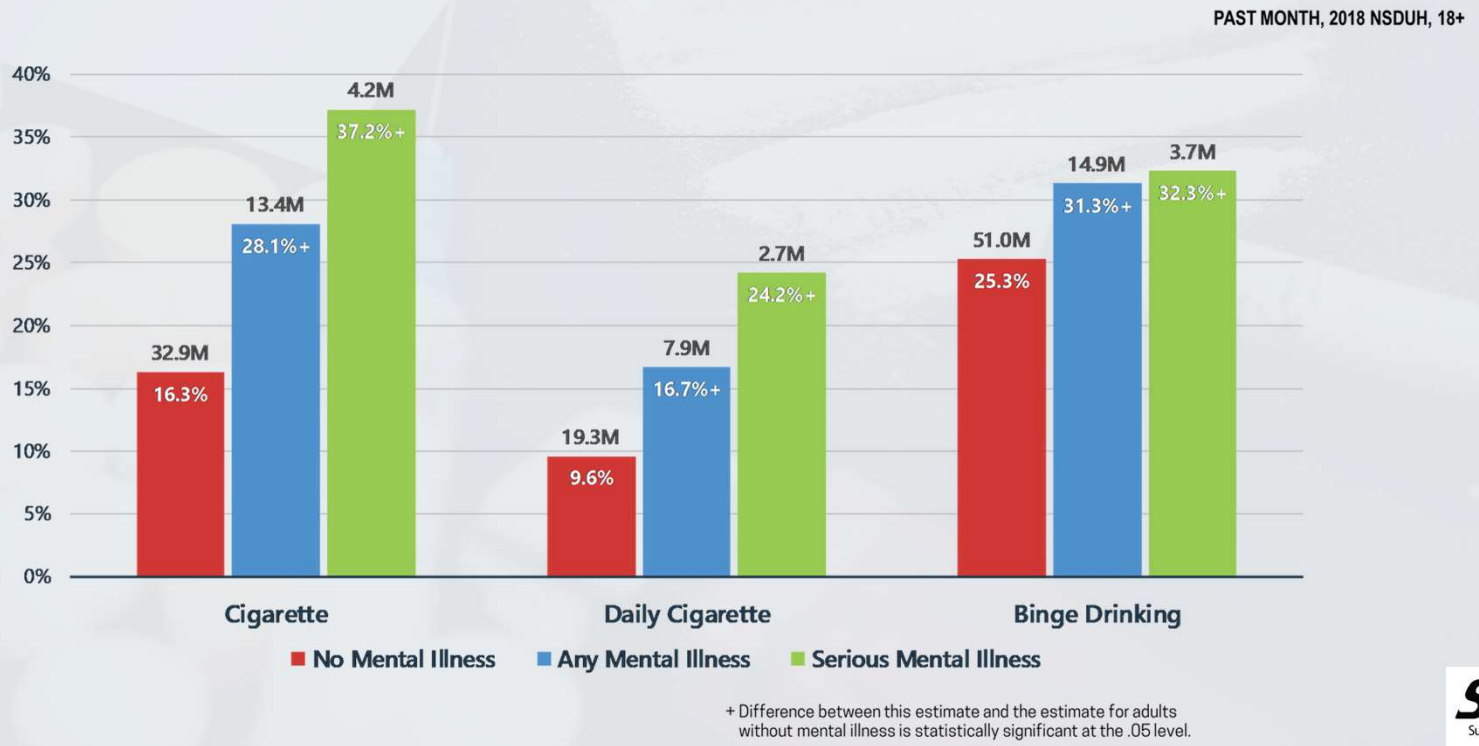
- High exposure to nicotine alters dopamine receptors essential for brain development.
- Reviewed 170 ADD vs. 3800 controls.
- Found 59% were smokers.
- Tripled risk of ADD – inattention and impulsive behavior.

Source: Journal of Pediatrics, August 2005

SMOKING CIGARETTES AS AN INDICATOR OF ALCOHOL MISUSE

- Looked at data on 42,374 adults.
- Daily smokers 3 times more likely.
- Found non-daily smokers 5 times more likely to abuse alcohol.
- Smoking should be indicator for primary care physicians to assess for alcohol abuse.

Co-Occurring Issues: Smoking & Binge Drinking more frequent among Adults (>18 y.o.) with Mental Illness



+ Difference between this estimate and the estimate for adults without mental illness is statistically significant at the .05 level.

SAMHSA
Substance Abuse and Mental Health Services Administration

Impact of Smoking and Alcoholism on Brain Neurobiology and Function

- Researchers said that smoking may affect a key amino acid (GABA) in the brain, meaning that drug therapy for alcohol withdrawal may have different effects on smokers than nonsmokers.
- Scientists also reported that MRI studies have shown that smoking makes alcohol-induced brain-tissue loss and neuronal injury worse among alcoholics who have recently detoxed.
- “Our analysis showed that chronically smoking alcoholics have greater brain abnormalities — that is, less brain tissue measured by structural MRI, and more neuronal injury measured by MRSI —at the beginning of their treatment for alcoholism than nonsmoking alcoholics.” said Meyerhoff.

Nicotine May Increase Cocaine and Heroin Use

- High exposure to nicotine alters dopamine receptors essential for brain development.
- Reviewed 170 ADD vs. 3800 controls.
- Found 59% were smokers.
- Tripled risk of ADD – inattention and impulsive behavior.

Source: Journal of Pediatrics, August 2005

Nicotine May Increase Cocaine and Heroin Use

Source: Experimental & Clinical Psychopharmacology Feb 2000

- Frosch et al. Found that more cigarettes smoked was related to more likely use of cocaine and/or heroin.
- Looked at 3 levels of smokers: none, 5 a day, 1-2 packs day.

Nicotine and Increased Dependence on Cocaine

Source: NIDA 2013

- An epidemiological analysis suggested that most people who initiate cocaine use do so as current cigarette smokers, and therefore incur this increased risk.
- National Epidemiological Study of Alcohol Related Consequences (NESARC), shows that the prevalence of cocaine dependence was 20 percent among respondents who were current smokers when they initiated cocaine use, and 6 percent among respondents who had never smoked or had stopped smoking before they first took cocaine.

Smoking During Pregnancy May Contribute to APD for Girls

Source: Waksschlag, L.S. Molecular Psychiatry 15(9) 928-937, 2010.

Smoking during Pregnancy has a direct effect on female development of conduct disorder. It occurs as the result of interaction with MAOA genotype.

Cessation Concurrent with Mental Health or Addictions Treatment

- Smoking cessation has no negative impact on psychiatric symptoms and smoking cessation may even lead to better mental health and overall functioning
- Participation in smoking cessation efforts while engaged in other substance abuse treatment has been associated with a 25 percent greater likelihood of long-term abstinence from alcohol and other drugs

Source: Baker et al., 2006; Lawn & Pols, 2005; Morris et al., Unpublished data; Prochaska et al., 2008; Bobo et al., 1995; Burling et al., 2001; Hughes, 1996; Hughes et al., 2003; Hurt et al., 1993; Pletcher, 1993; Prochaska et al., 2004; Rustin, 1998; Saxon, 2003; Taylor et al., 2000

Alcohol


JIM BEAM
JIM BEAM
JIM BEAM
JIM BEAM
BLACK BARREL
SELECT RESERVE
IRISH WHISKEY
SKMATES

Areas of the Brain Involved

- Most areas of the brain
- Causes number of GABA receptors to physically increase
- Affects endorphin receptors, allowing for intoxication
- Naltrexone blocks receptors
- Reduces serotonin - relates to blackouts
- Activates dopamine - chronic use decreases

Signs of Abuse:

-drowsiness
-aroma
-gait ataxia
-irrational
-lack of restraint
-slurred speech
-high accident rate

Signs of Withdrawal:

-hypertension
-sweating
-anxiety
-tremors
-insomnia
-disorientation
-physical complaints
-cravings

Blood Alcohol Levels:

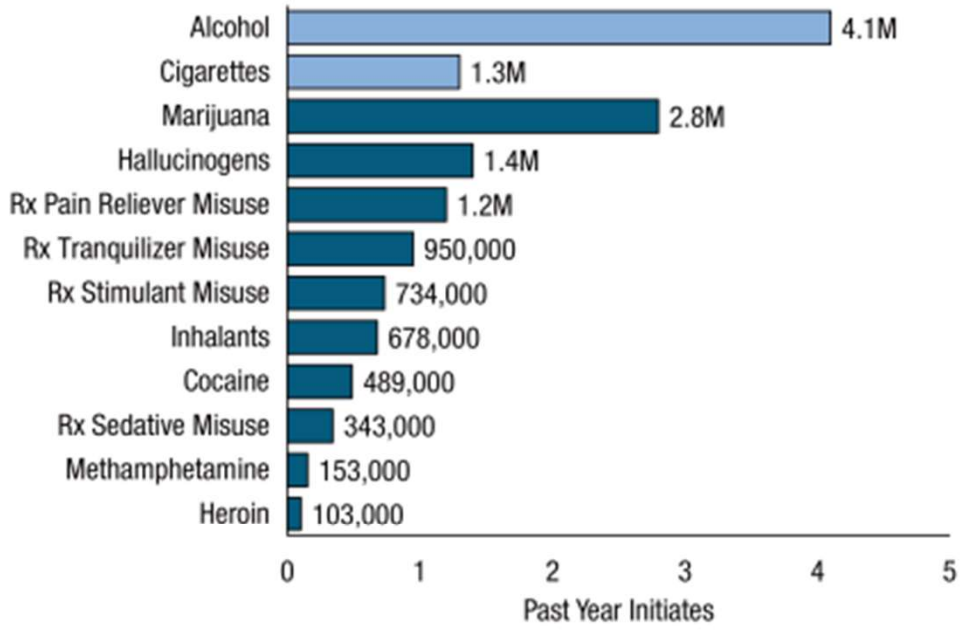
- .1% BAL motor coordination is impaired
- .2% BAL user is obviously intoxicated
- .3% BAL physical and mental activity decreases as user enters a stupor
- .35% BAL anesthesia is present
- .4% BAL most die from respiration cessation
- .6% BAL most are dead

Treatment Issues:

-detoxification
-AA requirements
-monitoring use
-family use
-FAS
-loss of judgement

Court Issues:

-dui/dwi concerns
-poly-drug use
-cross-reactions
-legality issues
-allowable or not
-consequences

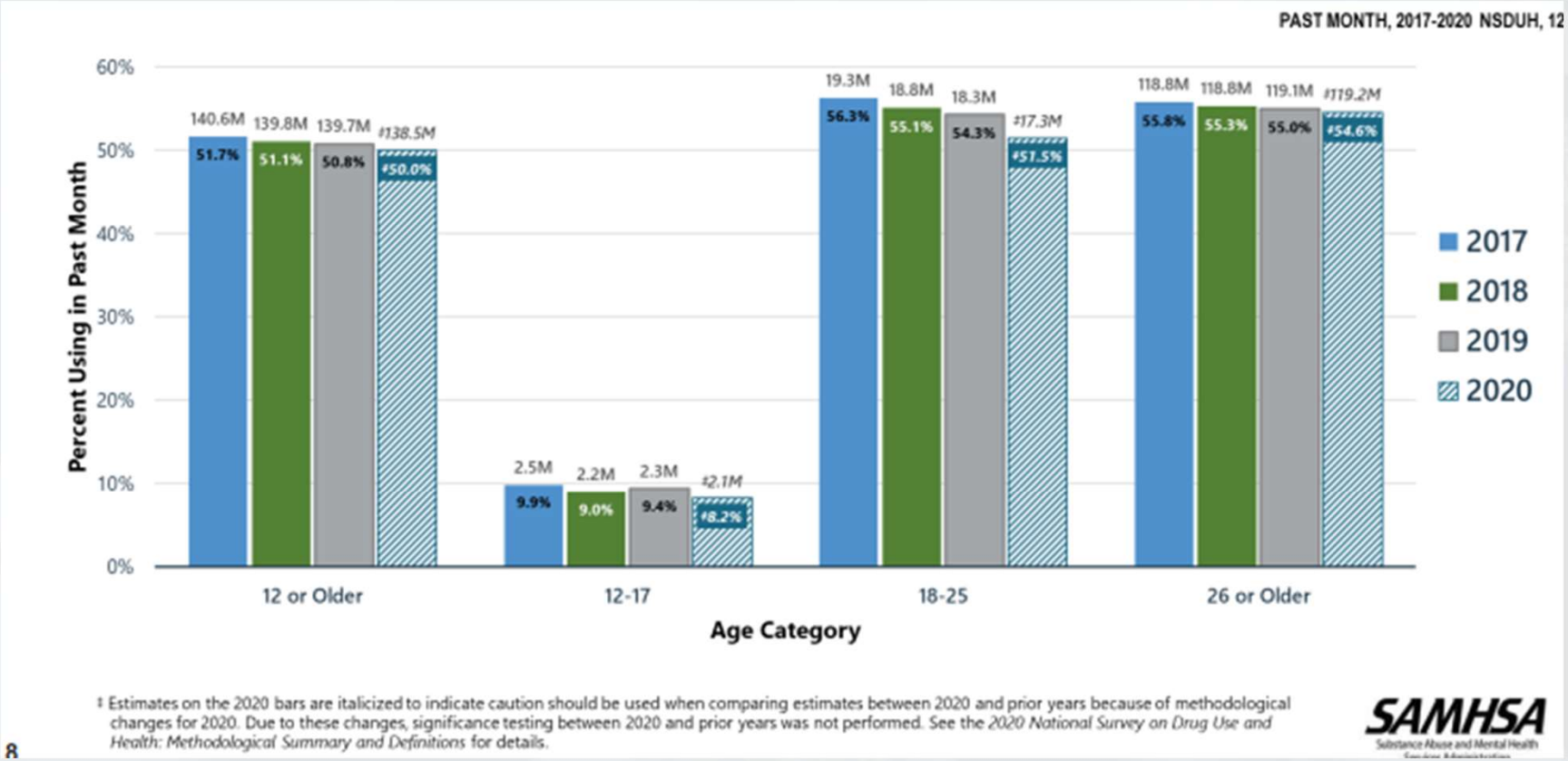


Rx = prescription.

Note: Estimates for prescription pain relievers, prescription tranquilizers, prescription stimulants, and prescription sedatives are for the initiation of misuse.

SAMHSA
Substance Abuse and Mental Health

Alcohol Use in Past Month: Among People Aged 12+



Alcohol

- 2/3 of victims who suffered violence by an intimate partner reported that alcohol had been a factor.
- Among spouse victims, 3 out of 4 incidents were reported to have involved drinking.

Source: U.S. Department of Justice Statistics 1998; NIAAA

What Is Substance Misuse?

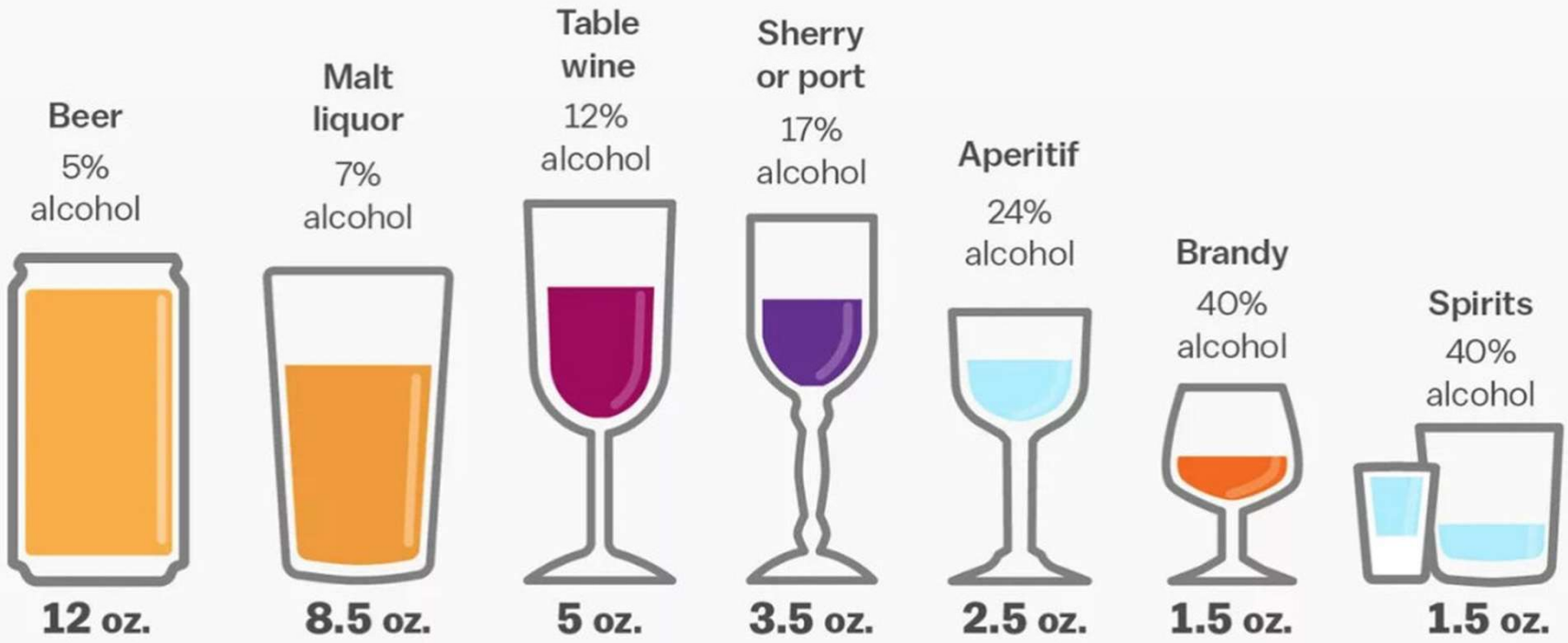
- The use of any substance in a manner, situation, amount, or frequency that can cause harm to users or to those around them. For some substances or individuals, any use would constitute misuse (e.g., underage drinking, injection drug use).
- **Binge Drinking:** Binge drinking for men is drinking 5 or more standard alcoholic drinks, and for women, 4 or more standard alcoholic drinks on the same occasion on at least 1 day in the past 30 days.

What Is Substance Misuse?

- **Heavy Drinking:** Defined by the CDC as consuming 8 or more drinks per week for women, and 15 or more drinks per week for men, and by the Substance Abuse and Mental Health Services Administration (SAMHSA), for research purposes, as binge drinking on 5 or more days in the past 30 days.
- **Standard Drink:** Based on the 2015-2020 Dietary Guidelines for Americans, a standard drink is defined as shown in the following graphic. All of these drinks contain 14 grams (0.6 ounces) of pure alcohol.

This is what one drink looks like

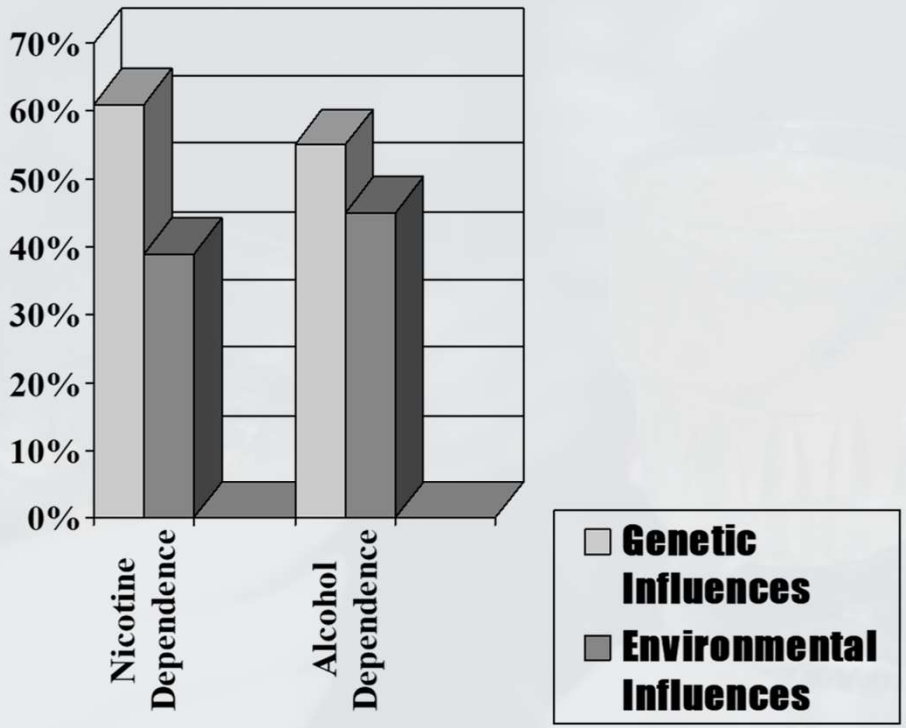
According to the Dietary Guidelines for Americans, moderate drinking is up to one drink per day for women and up to two drinks per day for men. A standard drink contains 14 grams of pure alcohol.



Measures are approximate, since different brands and beverages may vary in their actual alcohol content.

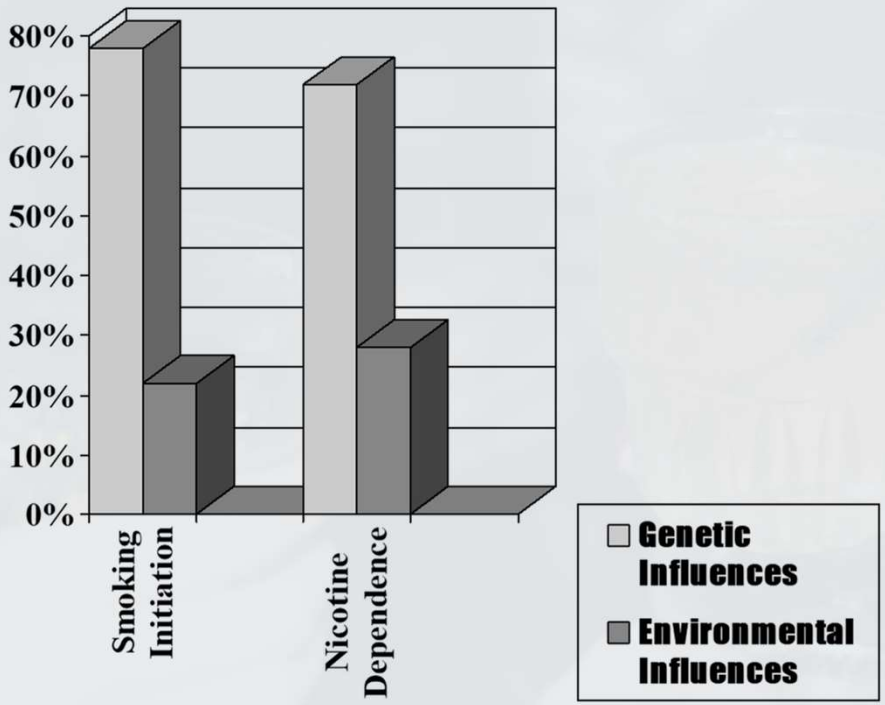
Vox

Genetic vs. Environmental Influences on Smoking and Drinking



- ST. LOUIS STUDY OF MALE TWINS

Genetic vs. Environmental Influences on Smoking and Drinking



- MEDICAL COLLEGE OF VIRGINIA STUDY OF FEMALE TWINS

Teens Driving under the Influence

- Among 15% of teens who admit they have driven under the influence of alcohol, 19% believe it makes them a better driver & another 19% believe it has no impact on their driving.
- Among 16% of teens admit to have driven under the influence of marijuana 34% believe it makes them a better driver & 41% believe it has no impact on their driving.

Source: SADD-Liberty Mutual Survey (USA Today April 2013)

MORE MEN DRINK TO EXCESS

Men:

18-24:	24.1%
25-44:	19.3%
45-64:	12.7%
65+:	2.9%

Women:

18-24:	8.6%
25-44:	4.8%
45-64:	2.0%
65+:	.4%

- 12 OR MORE IN LIFETIME
- 5 OR MORE 12X IN LAST YEAR

RESEARCH FINDINGS

- Alcohol damages dopamine reward cycle by first increasing then decreasing at chronic levels in the nucleus accumbens and hippocampus.
- Normal 8-10% of family develop alcoholism - one parent increases risk to 20-28% - thus increasing risk two-three times.

Source: Journal of Alcoholism: Clinical & Experimental Research Nov. 99

BRAIN DAMAGE FROM HEAVY SOCIAL DRINKING

- Heavy drinking – defined as follows:
  - 100 drinks for males & 80 for females per month
- Brain damage detectable in scans even those not in treatment – enough to impair day to day functioning (reading, balance, etc.)

Source: Alcoholism: Clinical & Experimental Research April 2004 Meyerhoff et al

Alcohol Impairs Cognitive Skills Longer than Motor Skills

Source: Alcoholism: Clinical & Experimental Research April 2004
Schweizer et al.

Found that BAC rising affects cognitive skills & motor skills. Motor skills improve as BAC decreases whereas cognitive skill impairment lingers. This creates illusion of sobriety even when impairment continues.

Alcohol Impairs Cognitive Skills Longer than Motor Skills

Source: Annual Meeting for Advancement of Science – April 2004 Olney, John W.

Reported levels of 2 cocktails could cause nerve cell death. Blood levels of .07 for one hour can cause the damage.

Research confirmed large doses of alcohol or anesthetic drugs cause damage.

The Science Behind .08 BAC What Is "BAC"?

- The amount of alcohol in a person's body is measured by the weight of the alcohol in a certain volume of blood, blood alcohol concentration.
- Alcohol is absorbed directly through the walls of the stomach and the small intestine, goes into the bloodstream, and travels throughout the body to the brain.
- Alcohol can be measured within 30 to 70 minutes after consumption.

WHAT ELSE AFFECTS MY BAC?

- MEDICATION/DRUGS AND BAC
  - Medication or drugs DO NOT CHANGE YOUR BAC
  - If you drink while taking certain medications, you may feel - and be - more impaired

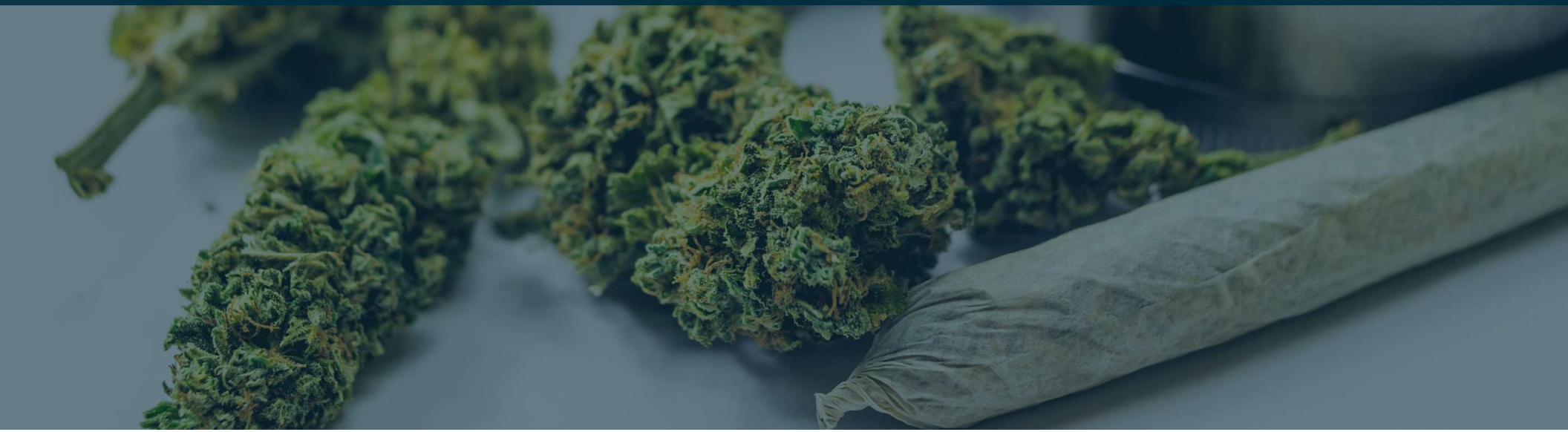
THE NATIONAL TRANSPORTATION SAFETY BOARD (NTSB) RECOMMENDS LOWERING THE BAC FOR DRUNK DRIVING TO

.05%

THE NATIONAL INSTITUTE OF HEALTH LOOKED AT MORE THAN 100 STUDIES ON THE SUBJECT

- At .08%, most people showed significant signs of impairment
- At .05% researchers documented changes in eye movement, visual perception and reaction time
- Even at .05%, some struggled with a simulated driving test
- Effects are stronger for sleep deprived and younger drivers

Marijuana



Areas of the Brain Involved

- Affects hippocampus
  - leading to impairment of short-term memory
- Affects cerebellum
  - affecting movement
- Affects hypothalamus
  - affecting appetite and eating

Signs of Abuse:

-dry mouth
-bloodshot eyes
-altered time
-impaired recall
-slowed motor skills
-depersonalization
-distorted perception
-munchies

Signs of Withdrawal:

-anger
-insomnia
-hyperactivity
-decreased appetite
-paranoia
-memory problems
-low productivity

Marijuana Addiction

- Early heavy users & steady increasers more likely to use other drugs and hamper education and earnings capacity.

- Occasional light users (those who use less than 10 times a year and started after 13) are least likely to suffer detriments but did exhibit slight losses when compared to abstainers.

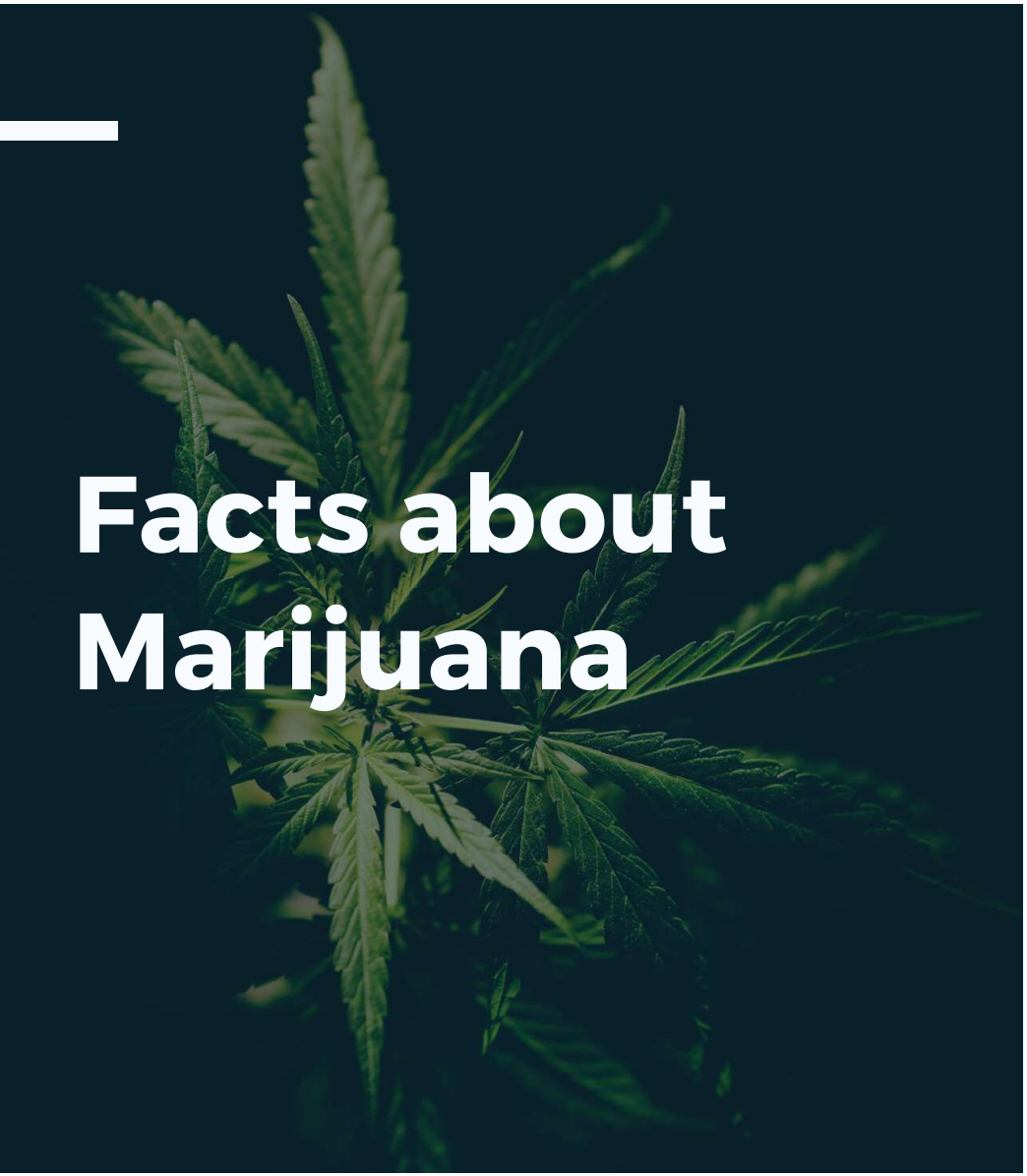
SOURCE: ELLICKSON ET AL. NIDA NOTES VOL 19 # 5, JAN 2005.; FERGUSSON ET AL.

A shift from brain systems controlling reward-driven use to habit-driven use differentiates heavy cannabis users who are addicted to the drug from users who aren't.

SOURCE:
HTTPS://WWW.SCIENCEDAILY.COM/RELEASES/2019/06/190613095213.HTM

The findings help explain how the brain becomes dependent on cannabis, and why not all cannabis users develop an addiction, even with long-term regular use.

SOURCE:
HTTPS://WWW.SCIENCEDAILY.COM/RELEASES/2019/06/190613095213.HTM



Facts about Marijuana

Marijuana also affects memory, learning, and motor functions. These impairments may last up to 30 days and therefore people may make poor judgements, or have motor impairment long after the high is gone. Therefore could affect a wide range of tasks.

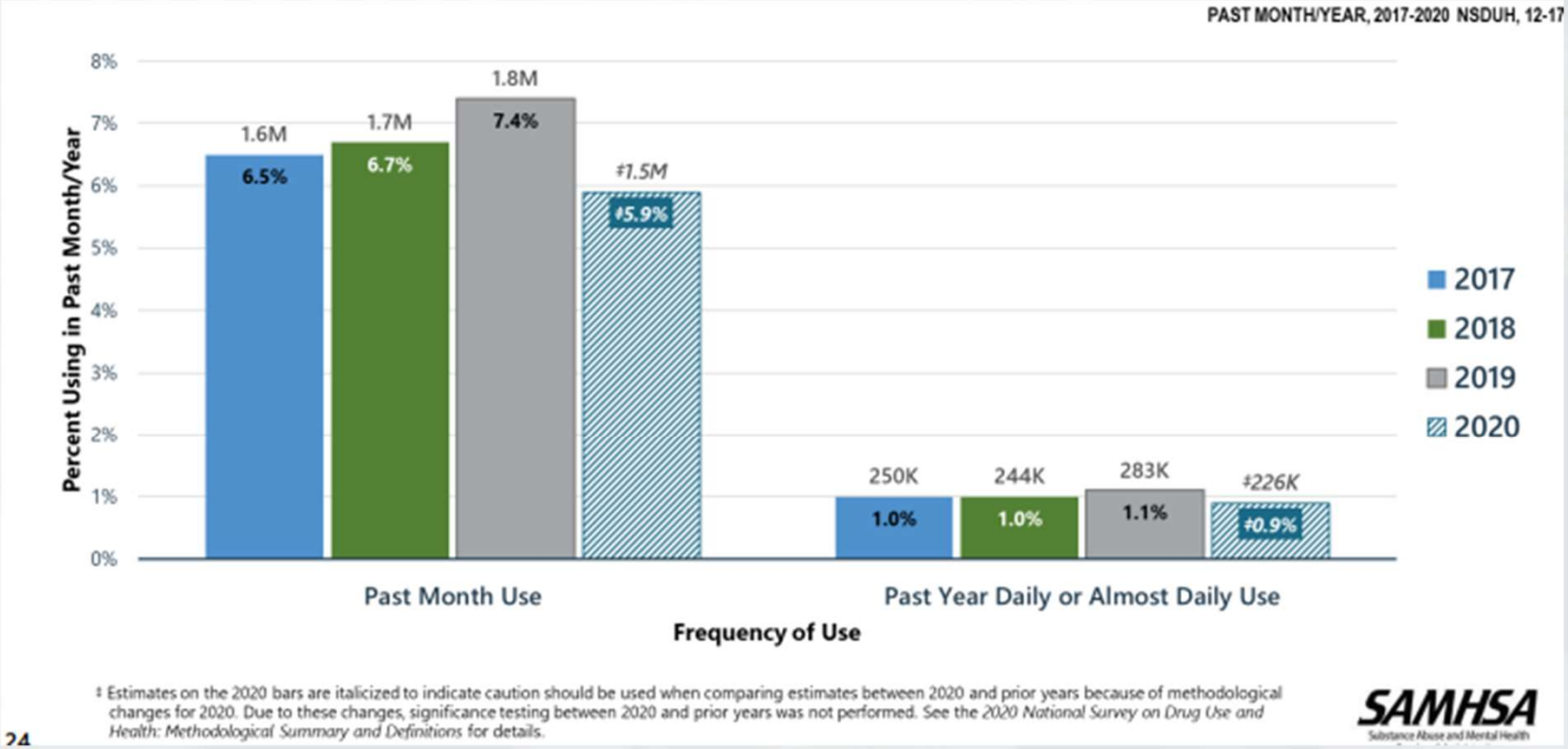
Marijuana Edibles Facts

SOURCE: USA TODAY MAY 2014

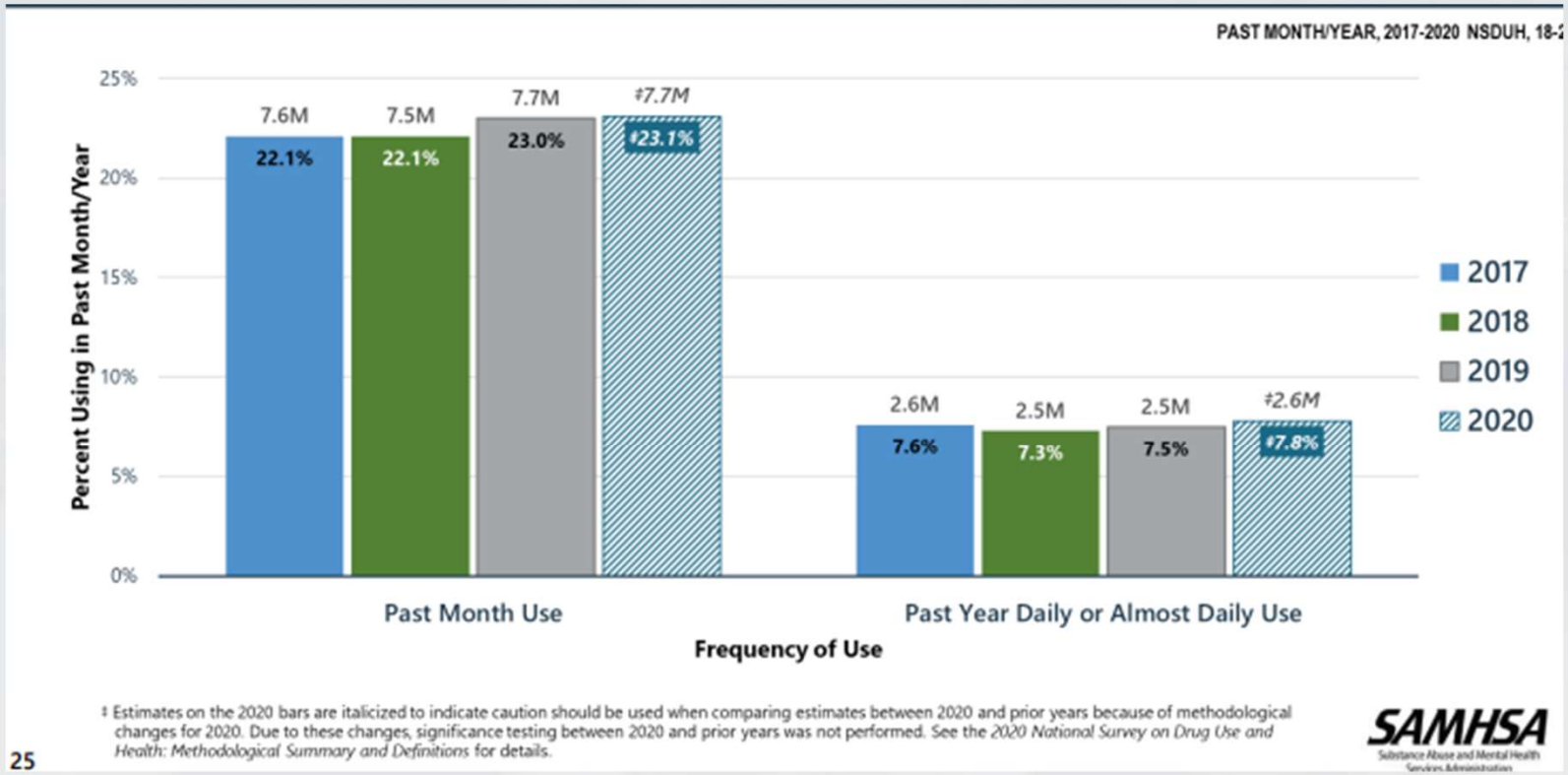
Edibles give users a different kind of high than the one from smoking marijuana, largely because pot is absorbed through the stomach instead of the lungs.

The effects are slower to arrive, generally last longer and can be more intense because people unwittingly eat more than they intend to.

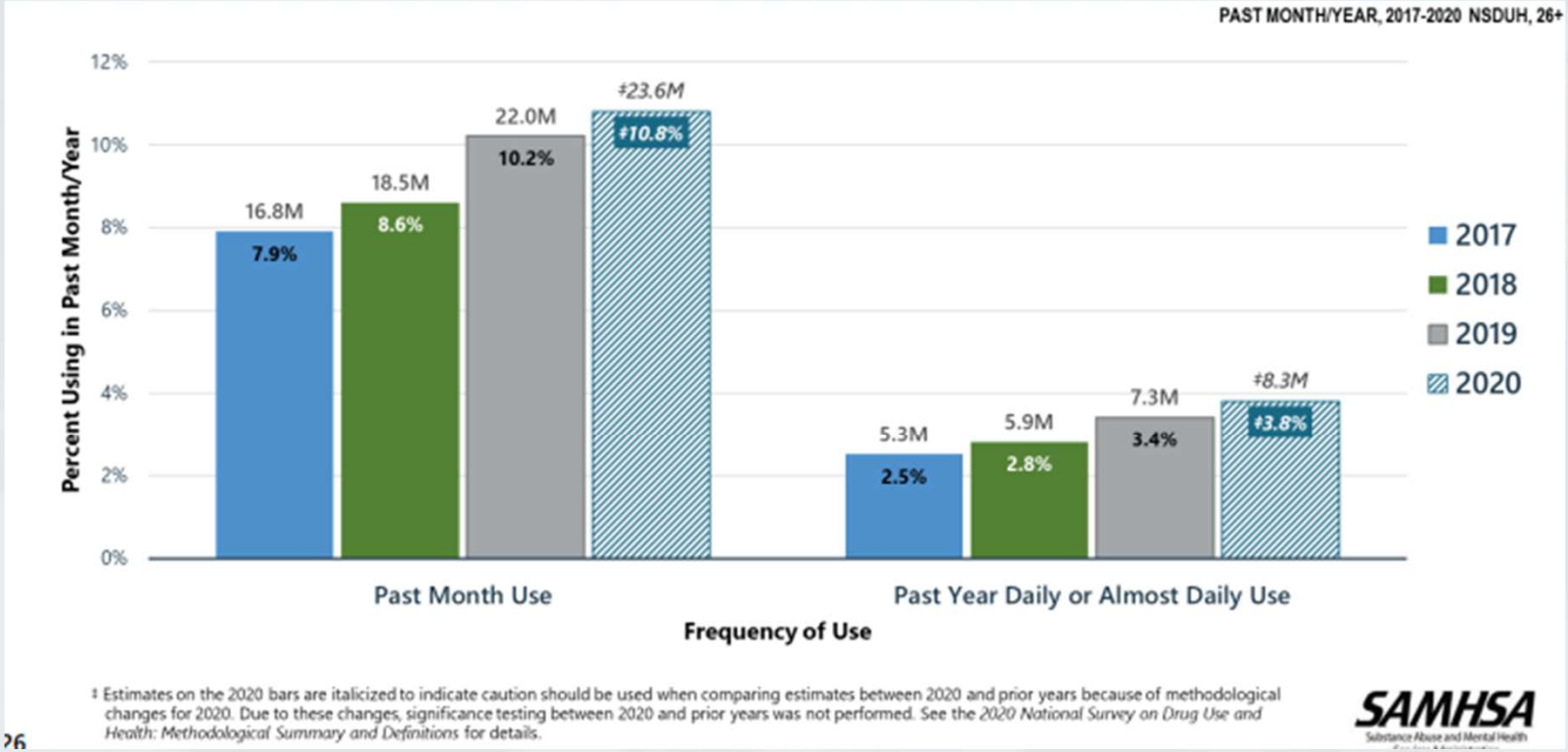
Frequency of Marijuana Use: Among Youths Aged 12-17



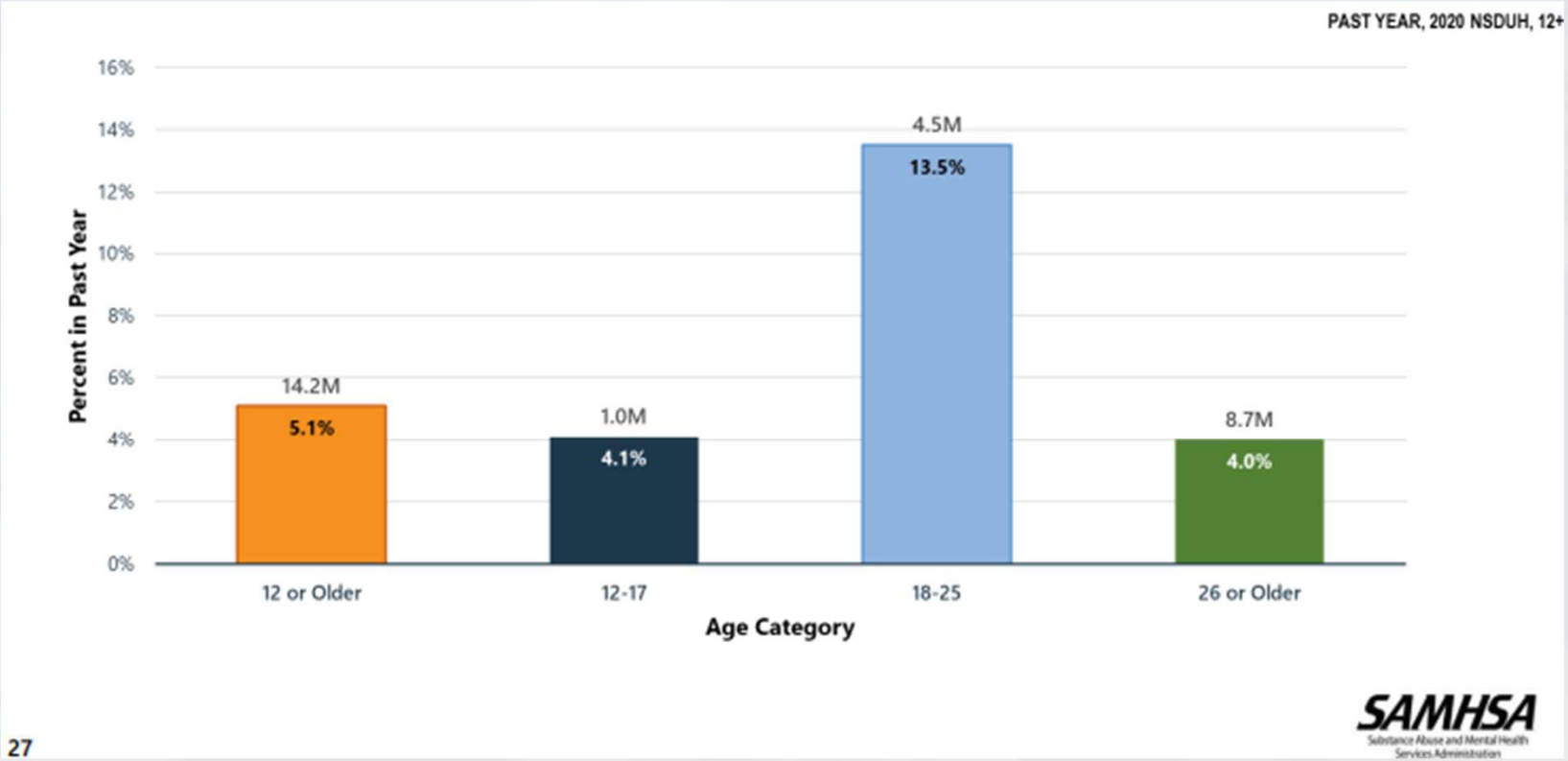
Frequency of Marijuana Use: Among Young Adults Aged 18-25



Frequency of Marijuana Use: Among Adults Aged 26+



Marijuana Use Disorder in Past Year: Among People Aged 12+



RECENT FINDINGS

- Marijuana is the most commonly abused illegal drug among adults and youths in the united states.
- Two recent meta-analyses have concluded that marijuana use during adolescence or young adulthood significantly predicts later involvement in criminal activity and criminal arrests

Source: SAMHSA (2012) Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings; SAMHSA, Center for Behavioral Health Statistics and Quality (2010); Bennet et al., 2008; Pedersen & Skardhamar, 2010.

RECENT FINDINGS

- The psychoactive ingredient in marijuana-thc-has increased almost six-fold in average potency during the past 30 years
- Marijuana use during adolescence is directly linked to the onset of major mental illness, including psychosis, schizophrenia, depression and anxiety.

Source: Mehmedic, Z., Pharm, M., Suman, C., Slade, D., Denham, H. Foster, S., et al. (2010) Journal of Forensic Sciences; Room, R. Fischer, B., Hall, W., Lenton, S. & Reuter, P. (2010) Cannabis Policy: Moving Beyond Stalemate.

Short Term Effects (low doses of marijuana)

SOURCE: CA AOC 2014

- Poor memory and ability to learn
- Dangerous driving behavior
- Difficulty thinking and solving problems
- Altered sense of time and space
- Poor muscle coordination and judgment
- Food cravings
- Short attention span

Short Term Effects (low doses of marijuana)

- Hallucinations
- Delusions
- Poor memory
- Not knowing where one is
- Anxiety attacks or feelings of paranoia
- Depression

SOURCE: CA AOC 2014

Long Term Effects of Marijuana Use

SOURCE: CA AOC 2014

- Cancer:
  - Marijuana contains the same cancer-causing chemicals found in tobacco smoke.
- Breathing problems
- Immune System:
  - The THC in marijuana can damage the cells and tissues in the body that help protect against disease.

Long Term Effects of Marijuana Use

SOURCE: CA AOC 2014

- Memory, learning, and energy are impaired
- Fertility:
  - Reproductive hormones are decreased.
  - Men: less testosterone, causing decreased sperm counts and possible erectile dysfunction
  - Women: irregular periods, decreased ability to conceive

EVIDENCE GROWS THAT HEAVY MARIJUANA USE MAY HARM BRAIN

- NIDA-funded research shows heavy marijuana use (at least four times per week over past six months) is linked to adverse changes in function and structure of brain areas associated with reward, decision making, and motivation.
- Heavy marijuana use can also enhance some brain circuits-possibly to compensate for reduced function in specific brain regions. (This was more pronounced in those who started using at a young age, indicating developing brains are more vulnerable to marijuana's effects.)

Source: NIH November 2014

Teen Marijuana Use Worsens Depression

- Two million teens report feelings of depression and loss of interest in daily activities during the past year.
- Depressed teens are twice as likely as their peers to abuse or become dependent on marijuana.
- **Teens who smoke marijuana as least once a month are 3x more likely to have suicidal thoughts than non-users.**
- The percentage of depressed adults and percentage of depressed teens is equal, but depressed teens are more likely to use marijuana and other drugs.

SOURCE: ELLICKSON ET AL. NIDA NOTES VOL 19 # 5, JAN 2005.; FERGUSSON ET AL.

Link Between Marijuana Use, Depression, and Other Mental Health Problems

- Teens who smoke marijuana when feeling depressed are also more likely to become addicted to marijuana or other illicit drugs.
- 8% of depressed teens abused or became dependent on marijuana during the year they experienced depression, compared with only 3% of non-depressed teens.
- Overall, more teens are in treatment for marijuana dependence than for any other illicit drug.

SOURCE: 2005 TREATMENT EPISODE DATA SET (TEDS), SAMHSA, 2008

Smoking Cannabis Can Lead to Manic Behavior

- Scientists have found a significant link between marijuana use and mania (ranging from hyperactivity and difficulty sleeping to aggression, becoming delusional, and hearing voices)
- Lead researcher Dr. Marwaha of Warwick University examined the effect of marijuana on people who had experienced mania, and set out to find:
  - Does cannabis use lead to increased occurrence of mania symptoms or manic episodes in individuals with pre-existing bipolar disorder, and
  - Does cannabis use increase the risk of onset of mania symptoms in those without pre-existing bipolar disorder.

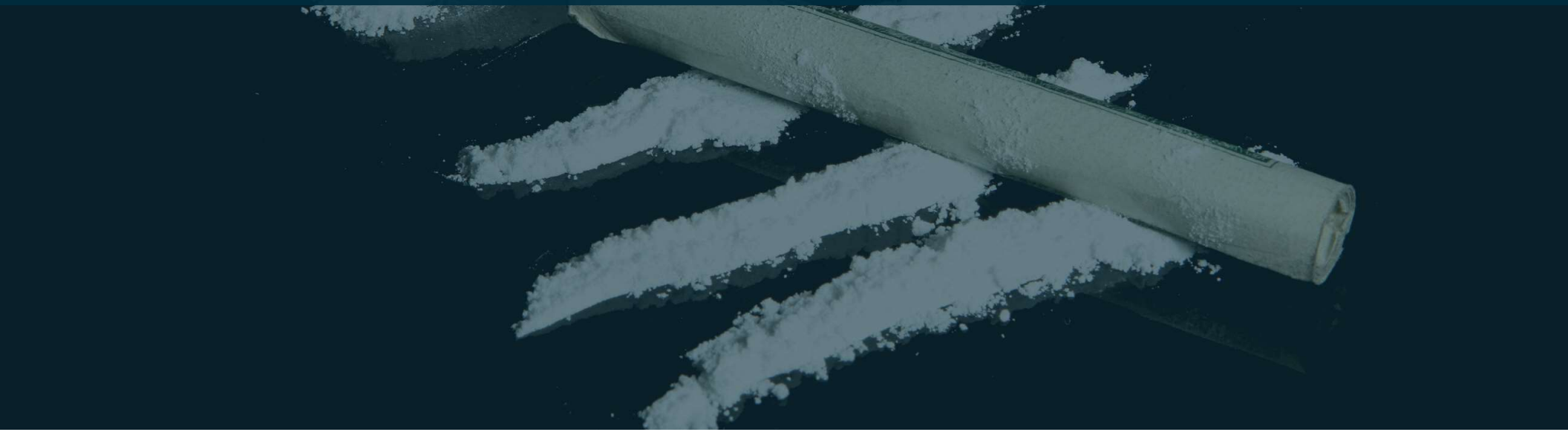
SOURCE: M. DAVIES FEBRUARY 2015, DAILYMAIL.CO.UK

Cannabis, Cognition, and Psychosis

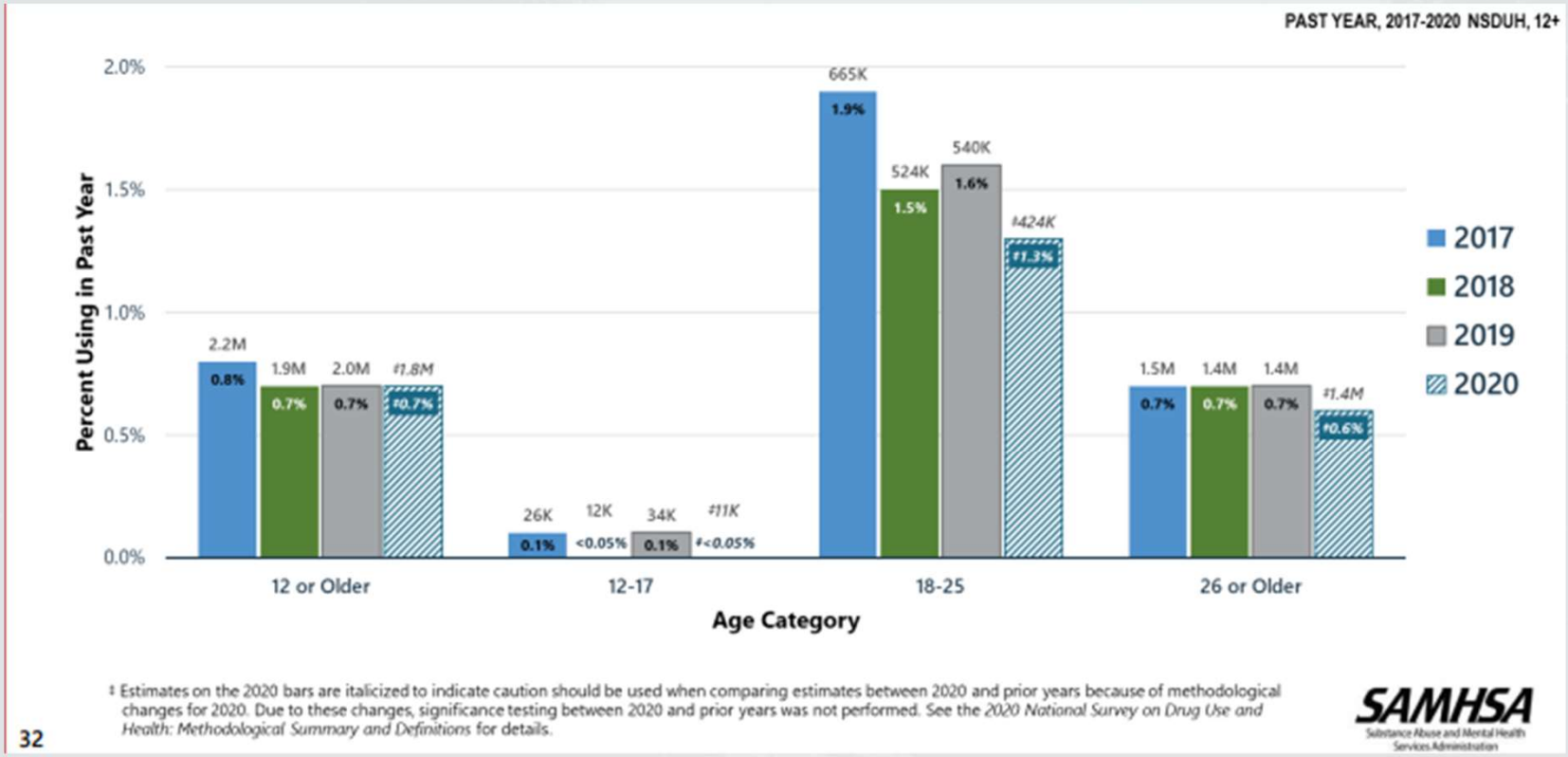
- Whether cannabis use could be linked to psychosis was another research focus. In a systematic review of 11 longitudinal, population-based studies that controlled for multiple variables, researchers found a **40% increased risk for psychotic symptoms in cannabis users**
- The body of evidence suggests that cannabis use carries with it increased risks for psychosis onset, worsening of existing psychotic conditions, and cognitive impairment, which may add to existing cognitive problems and disability in psychotic patients.

SOURCE: D. COWLEY JOURNAL WATCH PSYCHIATRY DECEMBER 28, 2007

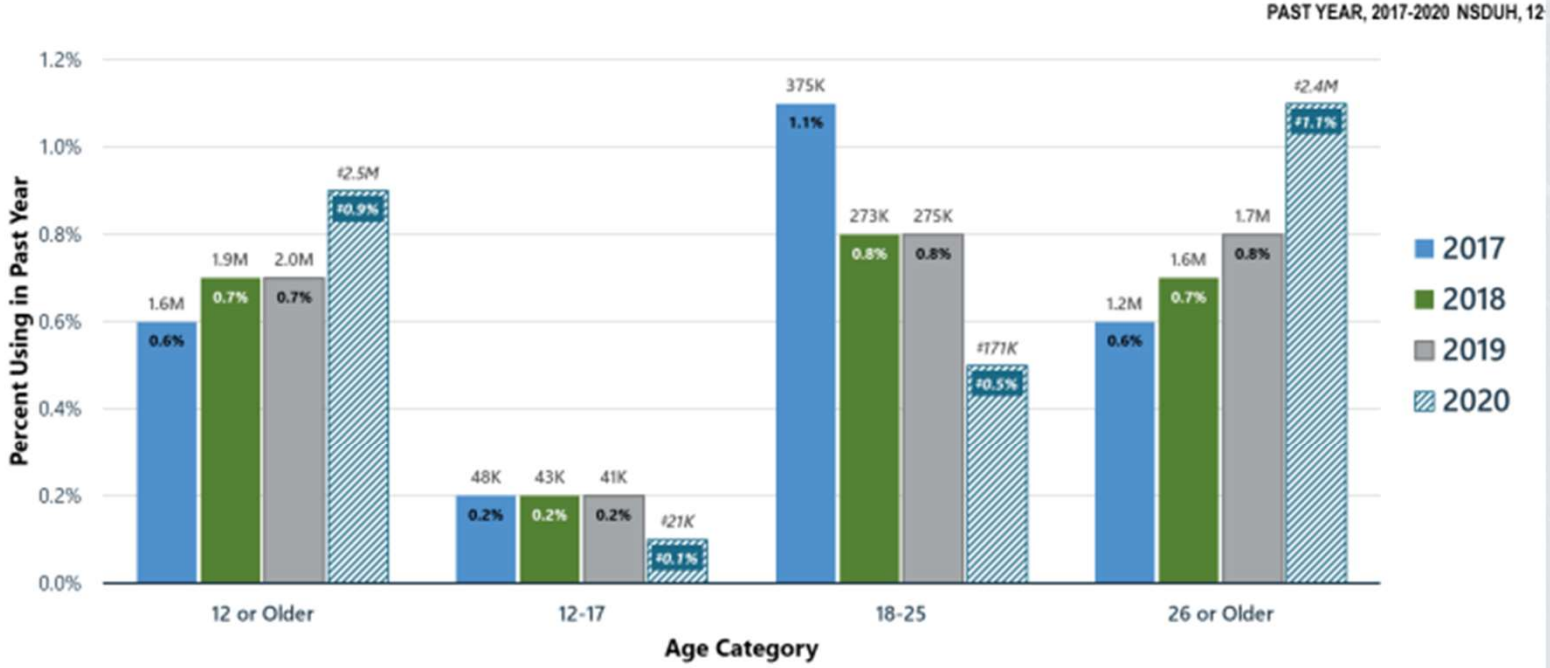
Cocaine & Amphetamines



Cocaine Use Disorder in Past Year: Among People Aged 12+



Methamphetamine Use Disorder in Past Year: Among People Aged 12+



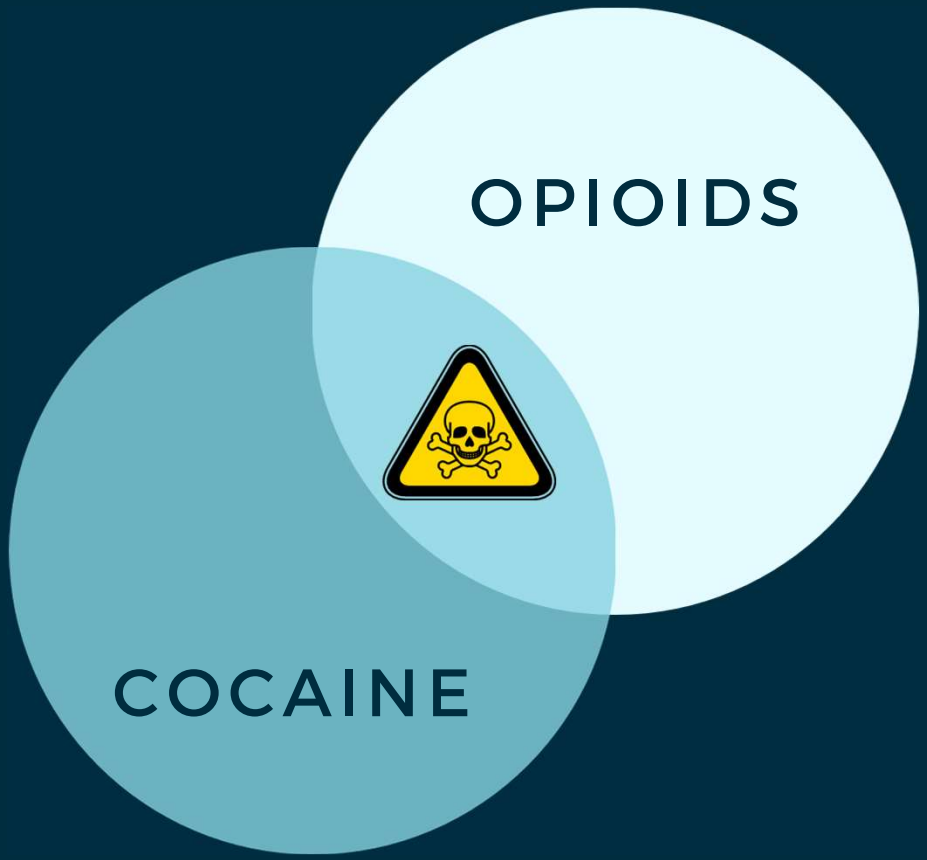
‡ Estimates on the 2020 bars are italicized to indicate caution should be used when comparing estimates between 2020 and prior years because of methodological changes for 2020. Due to these changes, significance testing between 2020 and prior years was not performed. See the *2020 National Survey on Drug Use and Health: Methodological Summary and Definitions* for details.

SAMHSA
Substance Abuse and Mental Health Services Administration

Cocaine Use Becoming Deadlier

- In 2017, opioids were involved in 72.7% of cocaine-involved overdoses, and the data suggest that increases in cocaine-involved deaths from 2012-2017 were driven primarily by synthetic opioids.

Source:
https://www.cdc.gov/mmwr/volumes/67/wr/mm675152e1.htm



WHILE COCAINE AND METHAMPHETAMINE ARE HIGHLY ADDICTIVE, USERS AREN'T AS LIKELY TO OVERDOSE AS THEY ARE WITH OPIOIDS. WHAT WE'RE NOW SEEING, HOWEVER, IS THE INTRODUCTION OF OPIOIDS - NAMELY FENTANYL - BEING MIXED WITH COCAINE AND AMPHETAMINES, LEADING TO A SIGNIFICANT INCREASE IN OVERDOSE DEATHS.

Increase in Cocaine & Methamphetamine Overdose Deaths

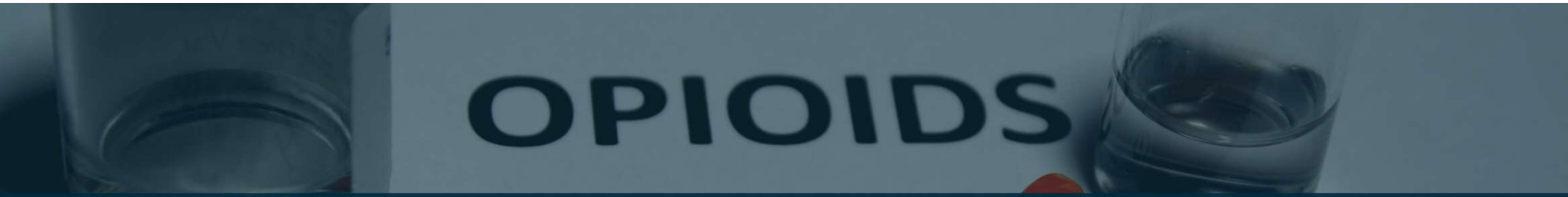
- Two in five overdose deaths involving cocaine also mentioned fentanyl.
- 34% overdose deaths involving cocaine also mentioned heroin.
- More than 20% of the overdose deaths involving methamphetamine also mentioned heroin.

SOURCE: HTTPS://WWW.CDC.GOV/NCHS/DATA/NVSR/NVSR67/NVSR67_09-508.PDF

“Defying the widespread perception that young people today subscribe to healthier lifestyles than previous generations, people between the ages of 18 and 25 are the biggest cocaine-consuming demographic in both markets. One reason could be that the cocaine market has become technology-driven rather than thug-dominated and monopolized; it’s a modern, entrepreneurial and competitive marketplace.”

SOURCE: HTTPS://WWW.BLOOMBERG.COM/OPINION/ARTICLES/2019-06-27/COCAINE-IS-BACK-BLAME-TECHNOLOGY-FOR-IT

Opiates



Areas of the Brain Involved

- Limbic system
- Brainstem
- Amygdala
- Thalamus
- Endorphins are increased

Signs of Abuse:

-euphoria
-pupil constriction
-constipation
-drowsiness
-itching
-slowed speech
-nausea

Signs of Withdrawal:

-acute anxiety
-craving
-aches and cramps
-sweats
-insomnia
-vomiting
-increased body functions

OPIOID MISUSE & OVERDOSE

- As of 2017, 11.4 million people misuse opioids: 4.2% of the population.
- “Rates of drug-overdose deaths in this country have outpaced mortality from motor vehicle accidents since 2013."

Source: https://www.samhsa.gov/data/sites/default/files/nsduh-ppt-09-2018.pdfhttps://www.nejm.org/doi/full/10.1056/NEJMp1604223#t=article

OVERDOSES INVOLVING OPIOIDS

- In 2017, a total of 70,237 people died from drug overdoses, with 47,600 (67.8%) of those deaths involving opioids.
- From 2016 to 2017, synthetic opioid-involved overdose death rates increased by 45.2%.

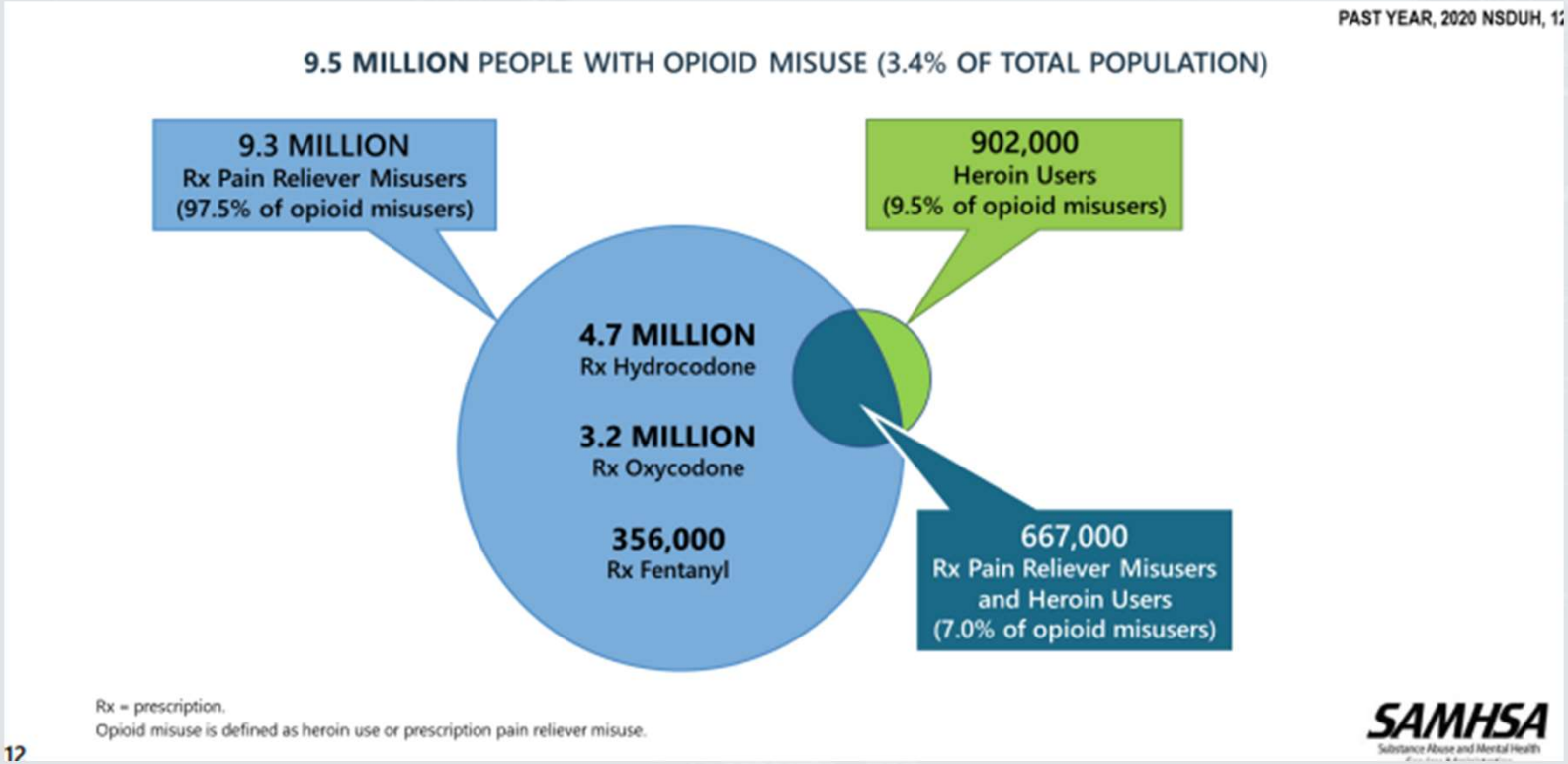
Source: https://www.cdc.gov/mmwr/volumes/67/wr/mm675152e1.htm

Common OUD Risk Factors & Comorbidities

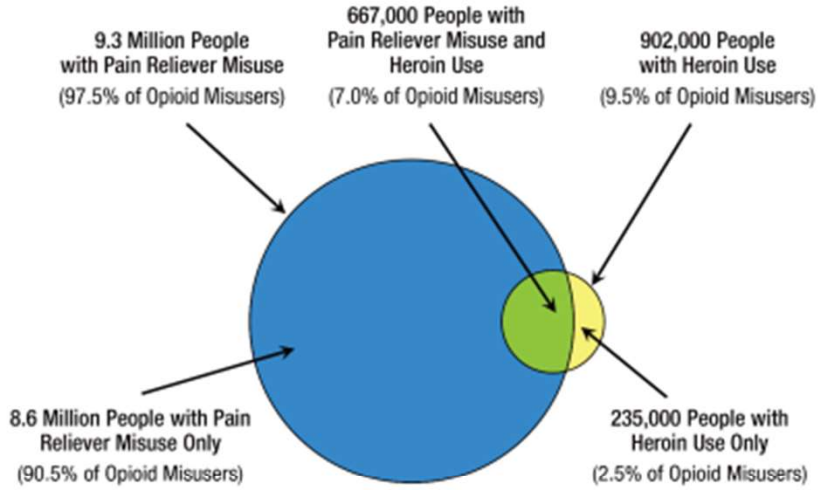
- Past or current substance abuse
- Untreated psychiatric disorders
- Younger age
- Social or family environments that encourage misuse
- Chronic pain conditions

SOURCE: HTTPS://WWW.NCBI.NLM.NIH.GOV/PUBMED/29049118

Prescription Pain Reliever Misuse and Heroin Use in Past Year: Among People Aged 12+



Past Year Opioid Misuse: Among People Aged 12+; 2020



9.5 Million People Aged 12 or Older with Past Year Opioid Misuse

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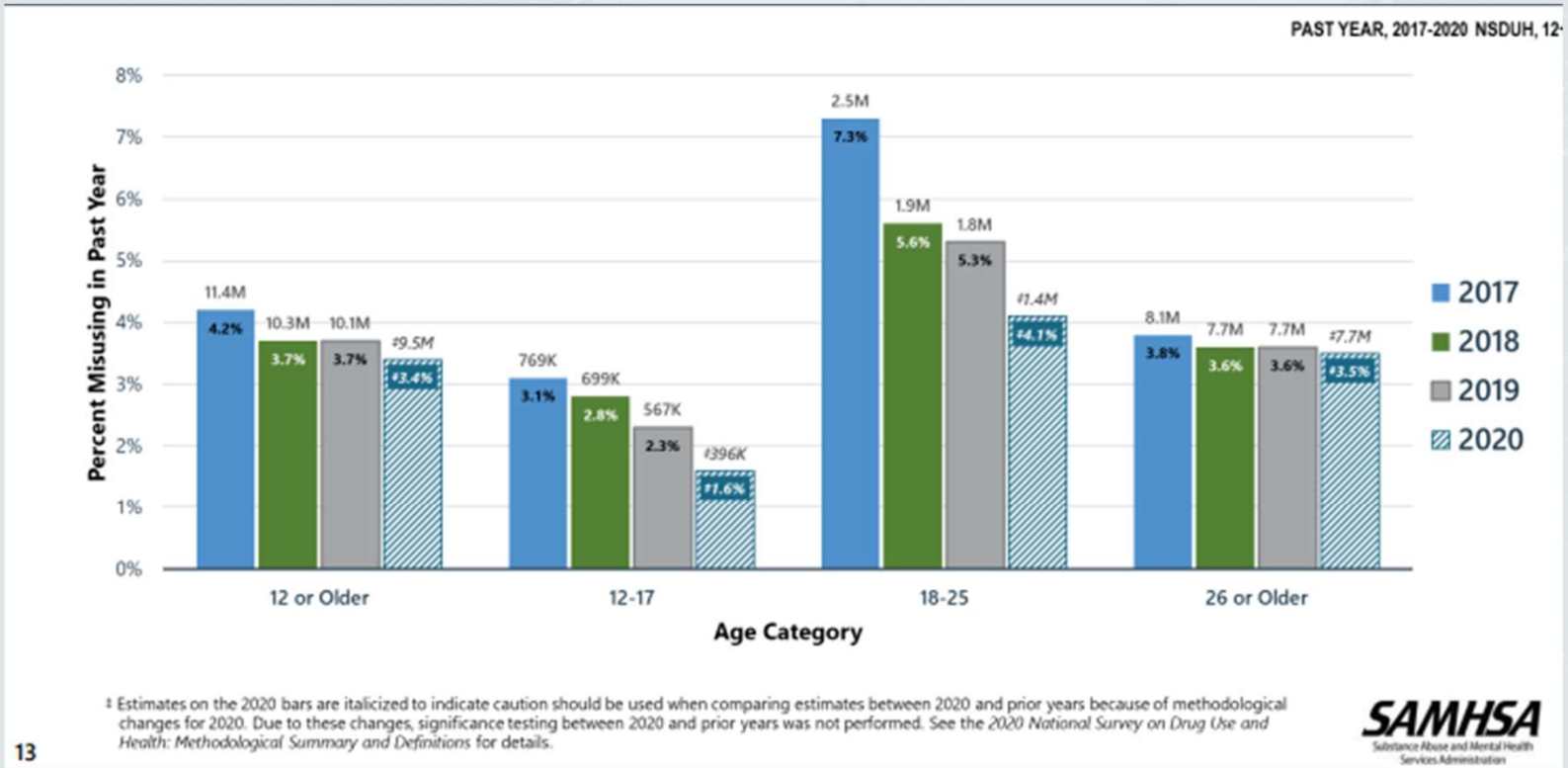
Past Year Opioid Misuse: Among People Aged 12+; 2020



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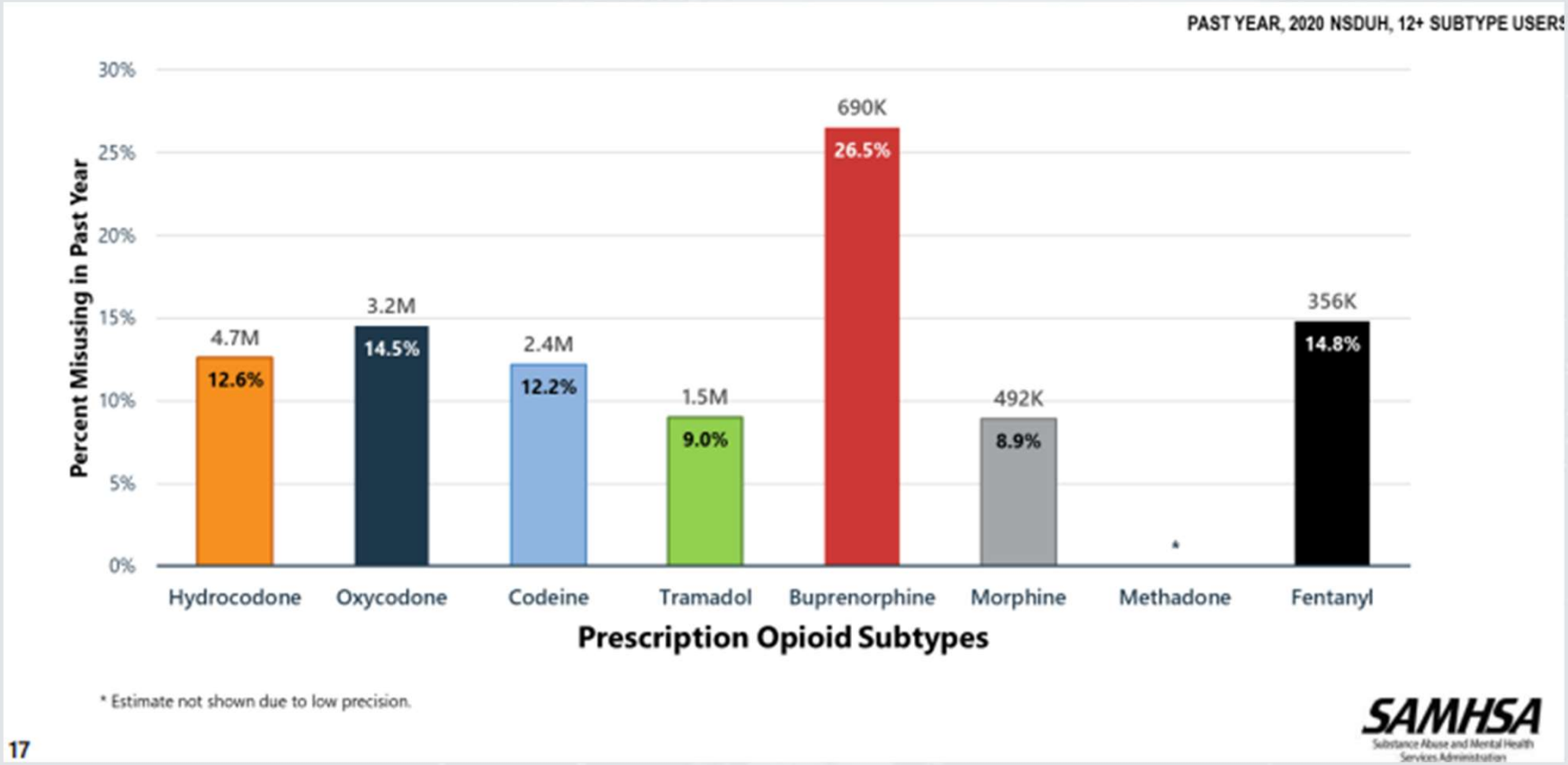
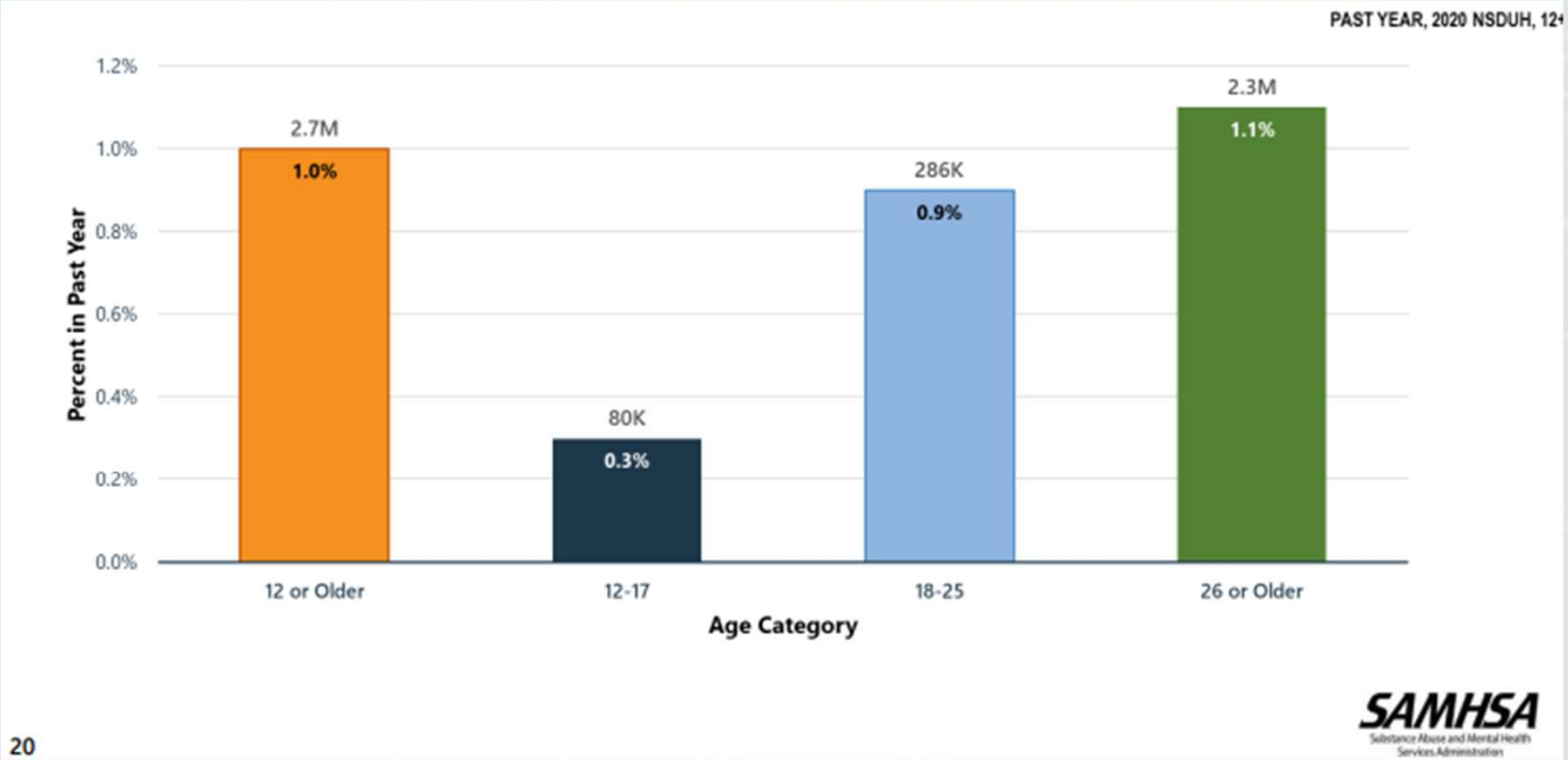
Misuse of Prescription Opioid Subtypes



Opioid Use Disorder in Past Year: Among People Aged 12+; 2020



What Does Opioid Addiction Do To The Brain?

When you sense something pleasurable, the brain releases dopamine, which tells the body, "I like this. Let's do it again."

Opioids trigger a release of dopamine greater than anything in nature can produce. "Repeated opioid use overloads circuits in multiple brain regions, including those involved with learning and memory, emotion, judgment and self-control. At the same time, the brain gradually releases less dopamine in response to other things the person once found pleasurable. Eventually they seek more of the drug not to get high, but to avoid constantly feeling low."

SOURCES: HTTPS://WWW.NBCNEWS.COM/HEALTH/HEALTH-NEWS/PEEK-OPIOID-USERS-BRAINS-THEY-TRY-QUIT-N1027911

Opiate Short Term Effects

- After initial rush: drowsiness, dry mouth, intense itchiness, nausea, slower heart rate & breathing, impaired mental ability
- Accidental overdoes with heroin occur when concentration is unknown and when mixing with other drugs
- Not uncommon for this overdose to lead to death
- IV users often share needles and are at greater risk HIV/AIDS, Hepatitis B and C
- Heroin users often have lung problems, like pneumonia.
- Pregnant women who take heroin during pregnancy have serious childbirth complications: stillbirth, miscarriage, and if the baby survives, typically goes through withdrawal immediately after birth

SOURCE: ALCOHOL DRUG EDUCATION SERVICE: OPIATE FACT SHEET 2006

Long Term Effects of Opiates

- Needle tracks and collapsed veins
- Frequent infections, acne, and other skin problems due to poor hygiene care and poor health
- Heart and valve infections and liver problems can develop over time as long-term use of opiates weakens the immune system
- Respiratory depression and increased risk of pulmonary and respiratory problems, such as pneumonia and bronchitis

SOURCE: ALCOHOL DRUG EDUCATION SERVICE: OPIATE FACT SHEET 2006

SIGNS OF OPIOID OVERDOSE

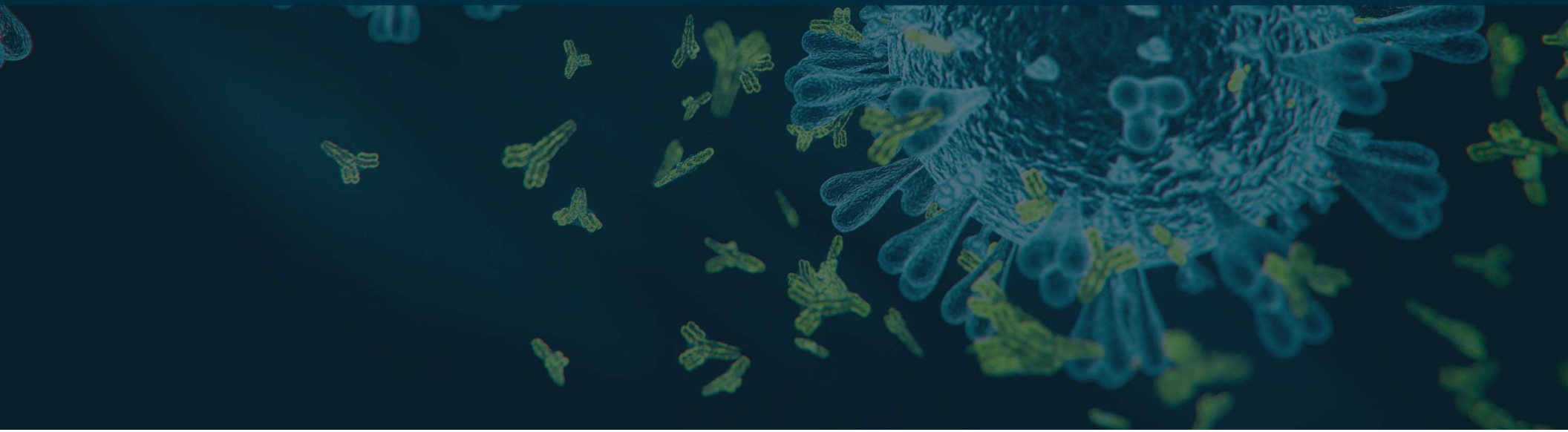
- Extreme sleepiness & inability to awaken verbally or by external rub
- Slow or shallow breathing
- Fingernails or lips turning blue/purple
- “Pinpoint” pupils
- Slow heartbeat and/or low blood pressure

Effects of Co-Occurring APD on Progress in MAT

- Some studies have found that people with APD and opioid addiction had:
  - more criminal activity
  - more history of early violent and aggressive behaviors
  - greater likelihood of activities that risked HIV transmission
  - more extensive & severe polydrug abuse –earlier onset of opioid use than opioid addicts without APD

SOURCE: BROONER ET AL. 1997; DARKE ET AL. 1996

COVID-19 Impact



Contact Us!

We'd love to hear your thoughts!

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