FACILITATING CHANGE FOR EXCELLENCE IN SBIRT

MENTAL HEALTH FIRST AID NATIONAL COUNCIL FOR BEHAVIORAL HEALTH Healthy Minds. Strong Communities.

Hilton CONRAD N. HILTON FOUNDATION

ADOLESCENT SUBSTANCE USE 101

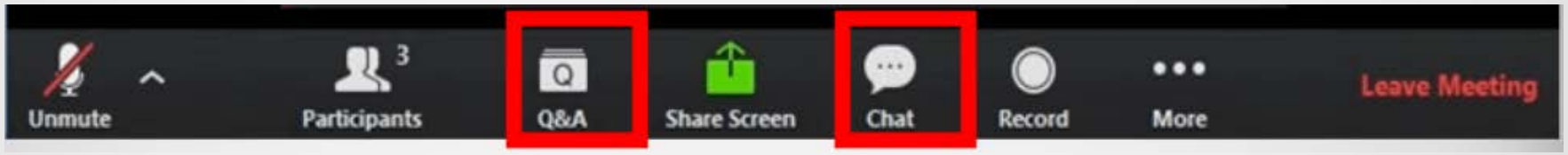
Current Trends and the Impact of COVID-19

UCLA INTEGRATED SUBSTANCE ABUSE PROGRAMS

How to Ask A Question

To ask a question, please enter it in the Q&A box you see on your zoom toolbar.

If you have a comment, please enter it into the chat box. When you enter a comment, you have two options, one to pose the comment to everyone or just privately to panelists, which is the default setting.



POLL: YOUR ROLE AND/OR ORGANIZATION

- Physician
- Group practice comprised of at least one physician
- Hospital outpatient department
- Federally qualified health center
- Rural health clinic
- Community mental health clinic
- Certified Community Behavioral Health Clinic
- Opioid treatment program
- Critical access hospital
- Other (enter in chat)

Today's Presenter

Thomas E. Freese, Ph.D.

Co-Director of the UCLA Integrated Substance Abuse Programs

Director of the Pacific Southwest Addictions Technology Transfer Center

Webinar Objectives

By the end of this webinar, participants will be able to:

1. Describe the psychoactive substances most commonly used by adolescents.

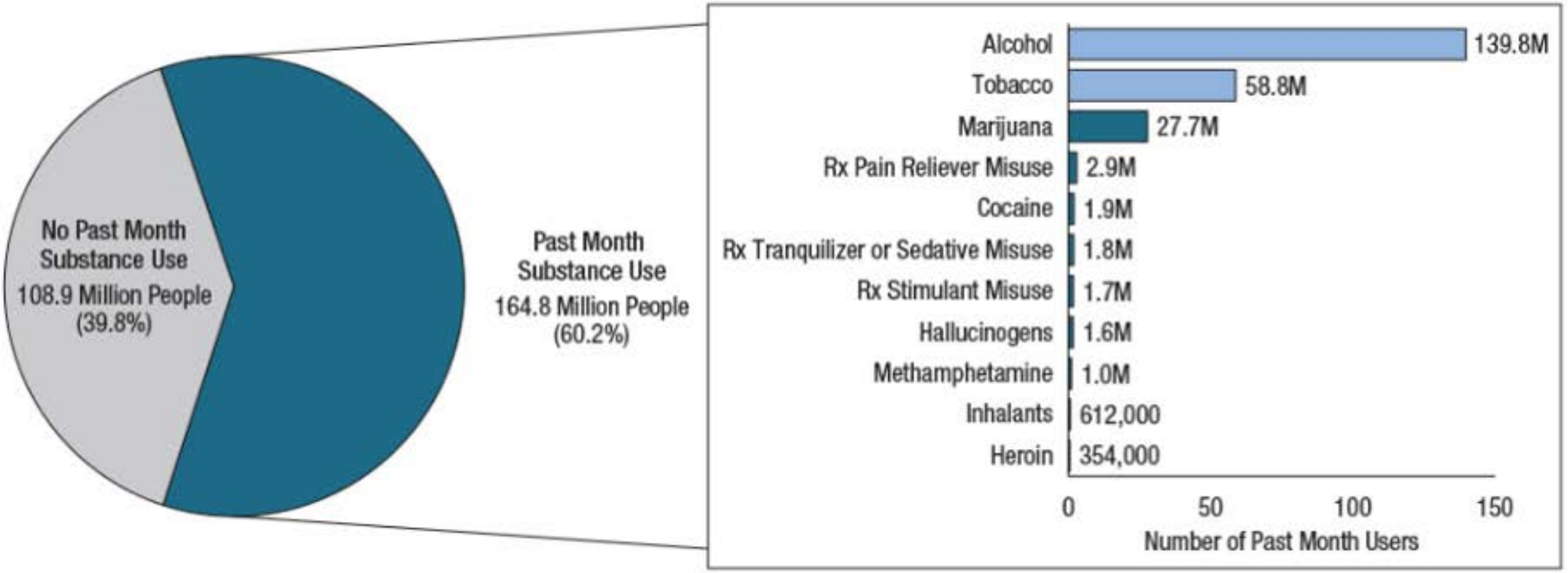
2. Discuss the main mechanisms of action for psychoactive substances.

3. Describe the main reasons adolescents use psychoactive substances.

What substances are being used by the teenagers that you are seeing?

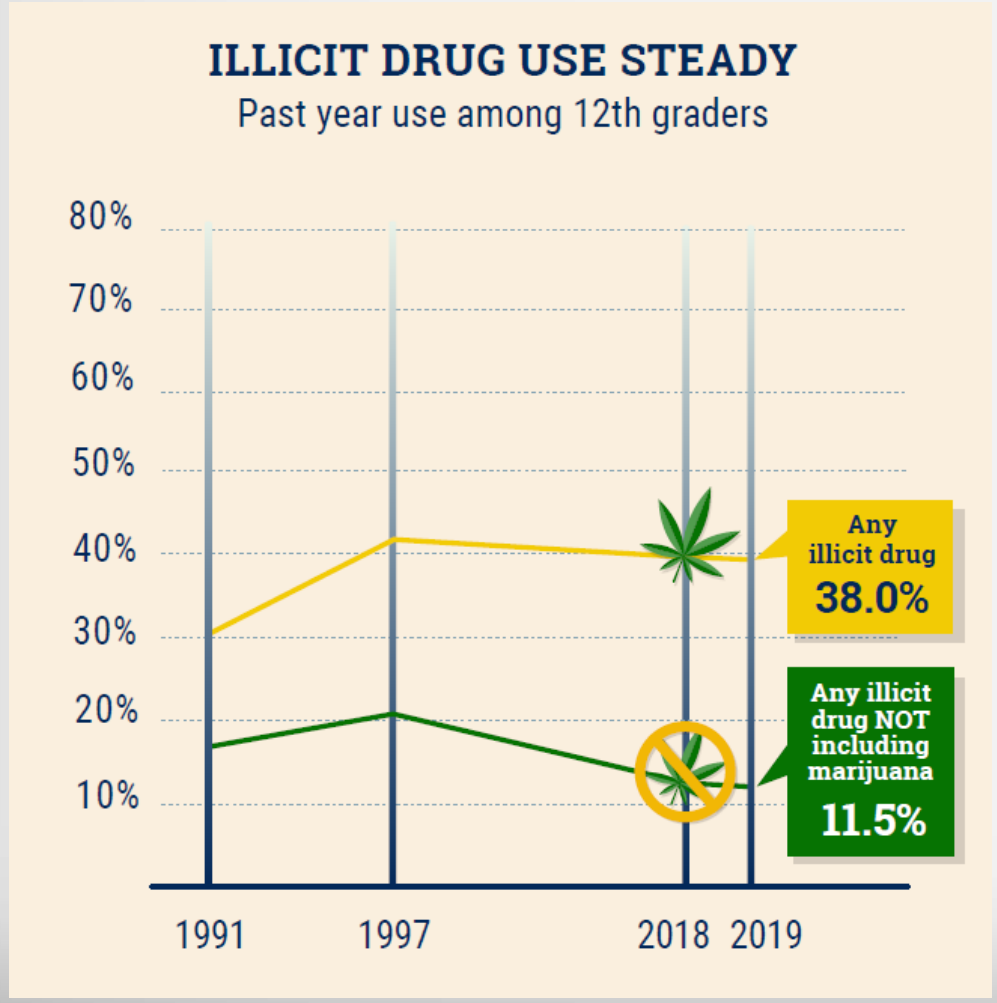
Please type your answer in the chat feature

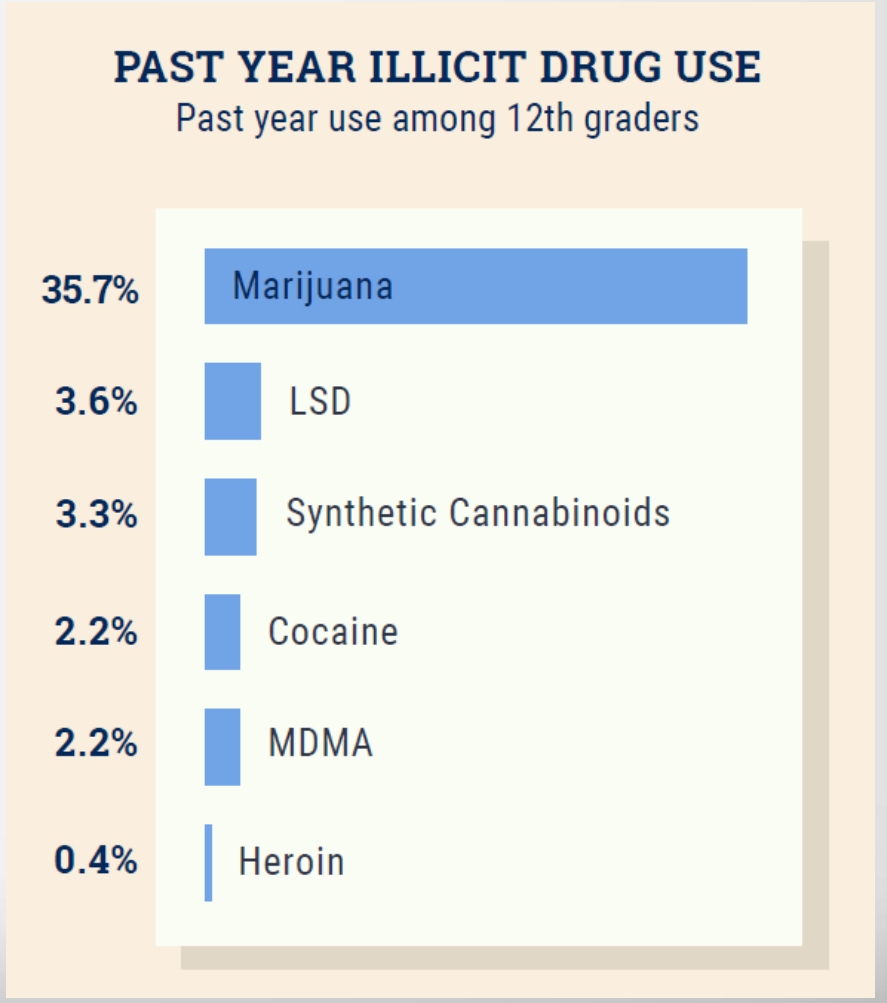
Numbers of People Reporting Past Month Substance Use among those Aged 12 or Older: 2018



SOURCES: McCance-Katz, 2019; SAMHSA, 2019

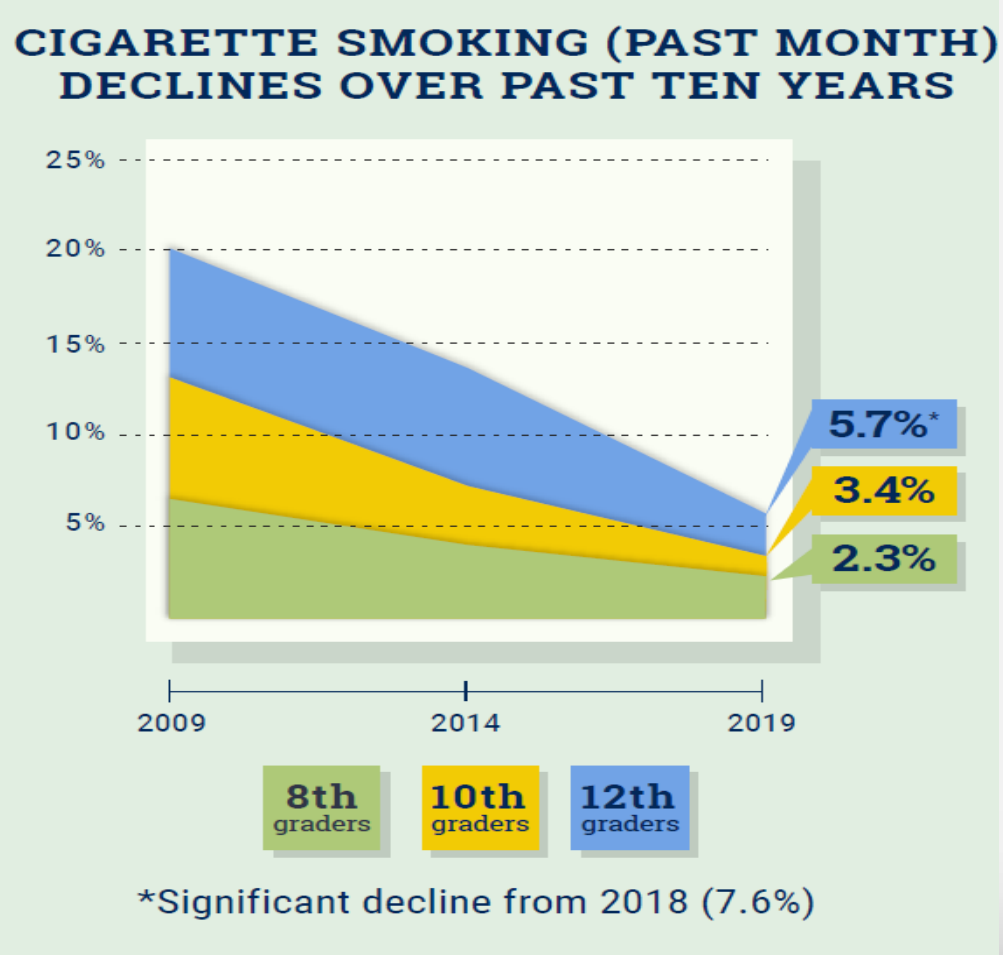
Substance Use Trends in School Populations

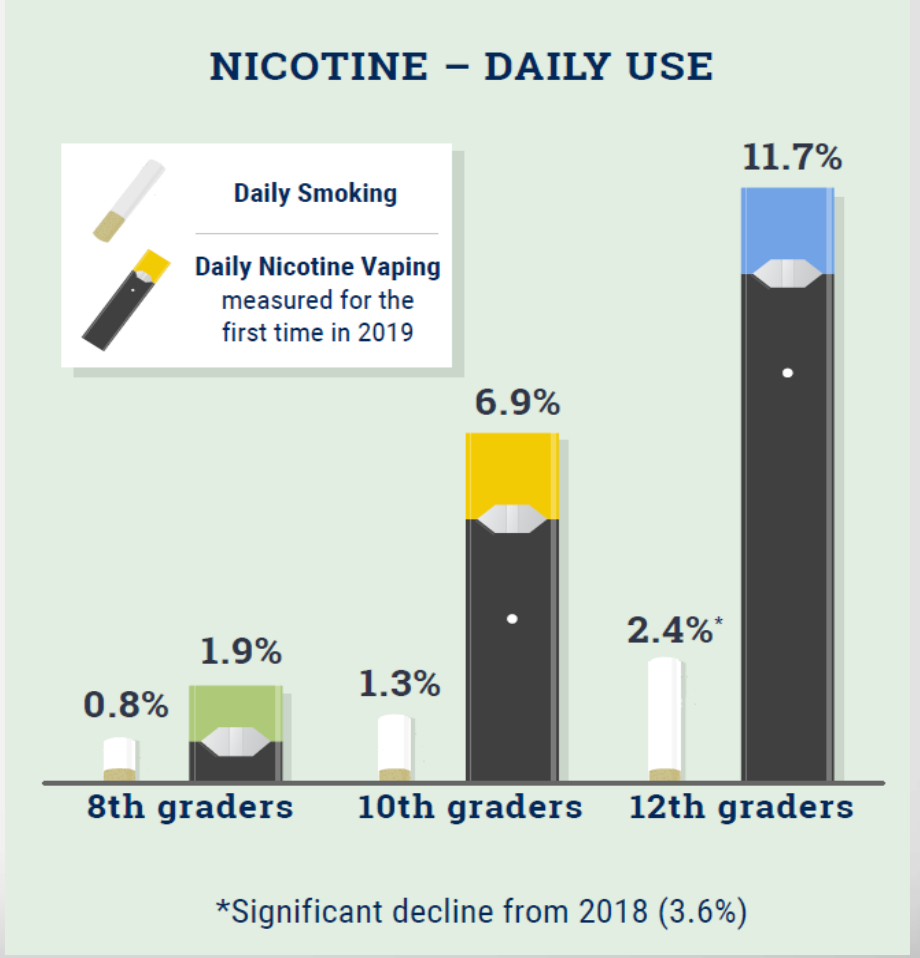




Source: National Institute on Drug Abuse, 2019

Substance Use Trends in School Populations





Source: National Institute on Drug Abuse, 2019

What is a "drug"?

"In medicine it refers to any substance with the potential to prevent or cure disease or enhance physical or mental welfare, and in pharmacology to any chemical agent that alters the biochemical or physiological processes of tissues or organisms"

(World Health Organization, 1994)

"…any substance people consider to be a drug, with the understanding that this will change from culture to culture and from time to time."

(Krivanek, 1982)

WHY DO PEOPLE USE ALCOHOL AND DRUGS?

To feel good

To have novel:
Feelings
Sensations
Experiences
AND
To share them

To feel better

To lessen:
Anxiety
Worries
Fears
Depression
Hopelessness
Withdrawal

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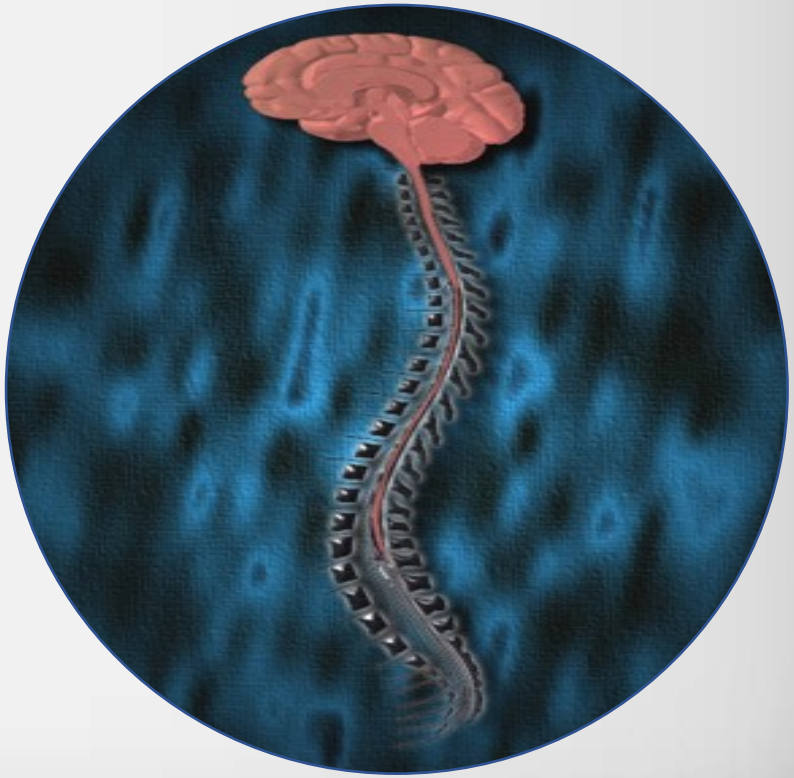
WHAT ARE PSYCHOACTIVE SUBSTANCES?

• Psychoactive substances interact with the central nervous system (CNS), which consists of the brain and spinal cord.

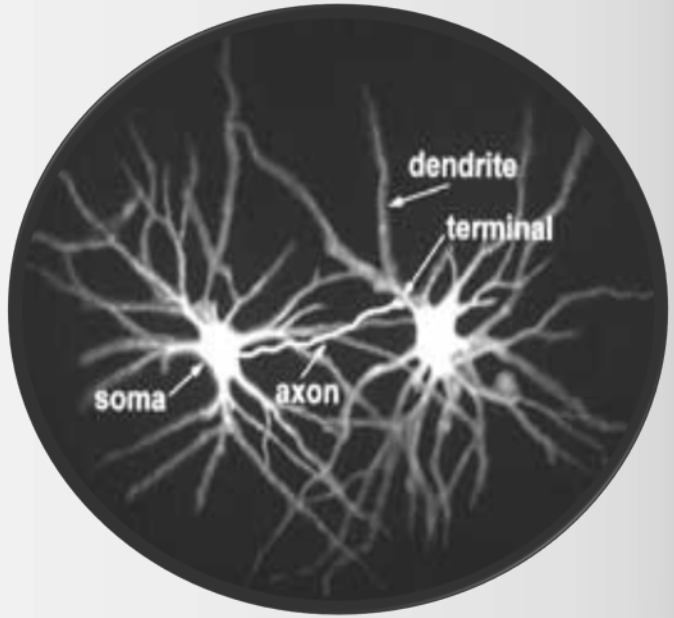
• By changing functioning of CNS, they impact:

- •Mental processes and behaviors
- •Perceptions of reality
- •Alertness
- •Response time



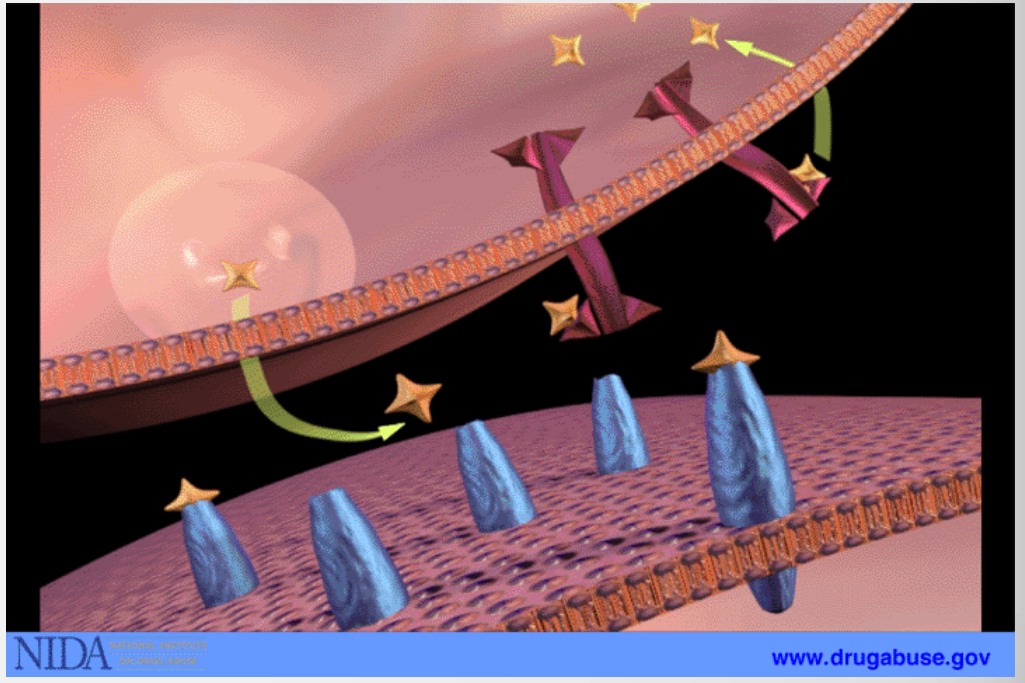
What Psychoactive Substances Do

- They act on neurons, cells that process information in the brain.
- Neurons communicate by releasing neurotransmitters, which bind to specialized proteins called receptors.
- Neurons pass messages to one another in milliseconds
- Chemical structure of psychoactive substances alters neurons, neurotransmitters, and receptors

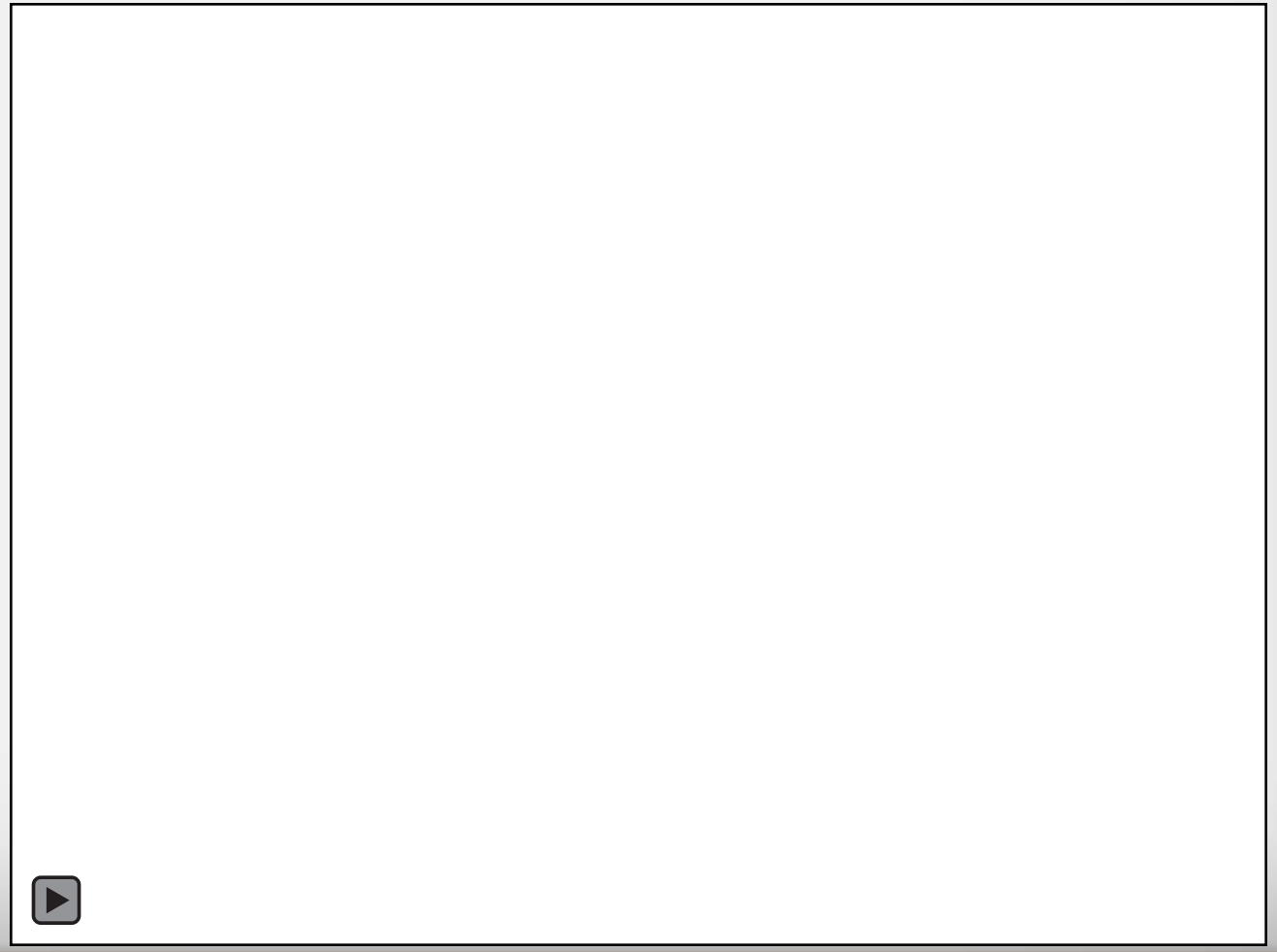


What Psychoactive Substances Do: Trigger Dopamine

- Dopamine is the neurotransmitter released when we do things essential for survival (eat, drink, sex)
  - Pleasure/Well-being
  - Satiation
  - Sedation
- Psychoactive drugs' chemical structures stimulate release of dopamine in different parts of the brain

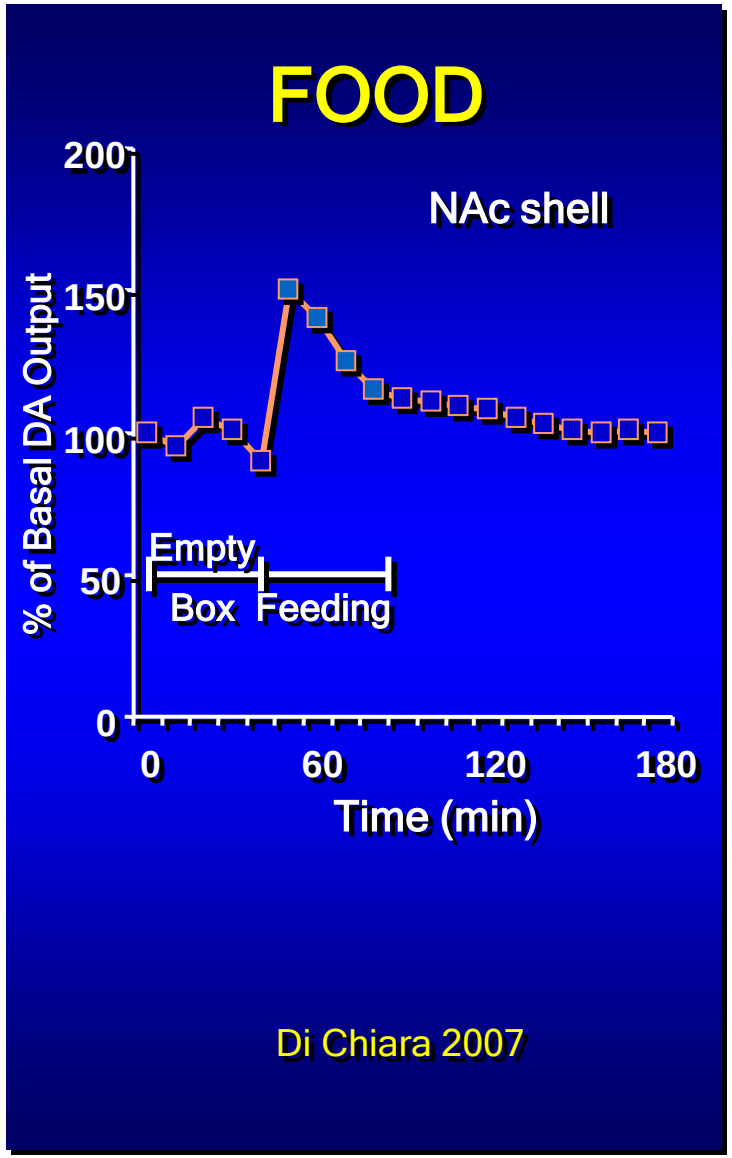


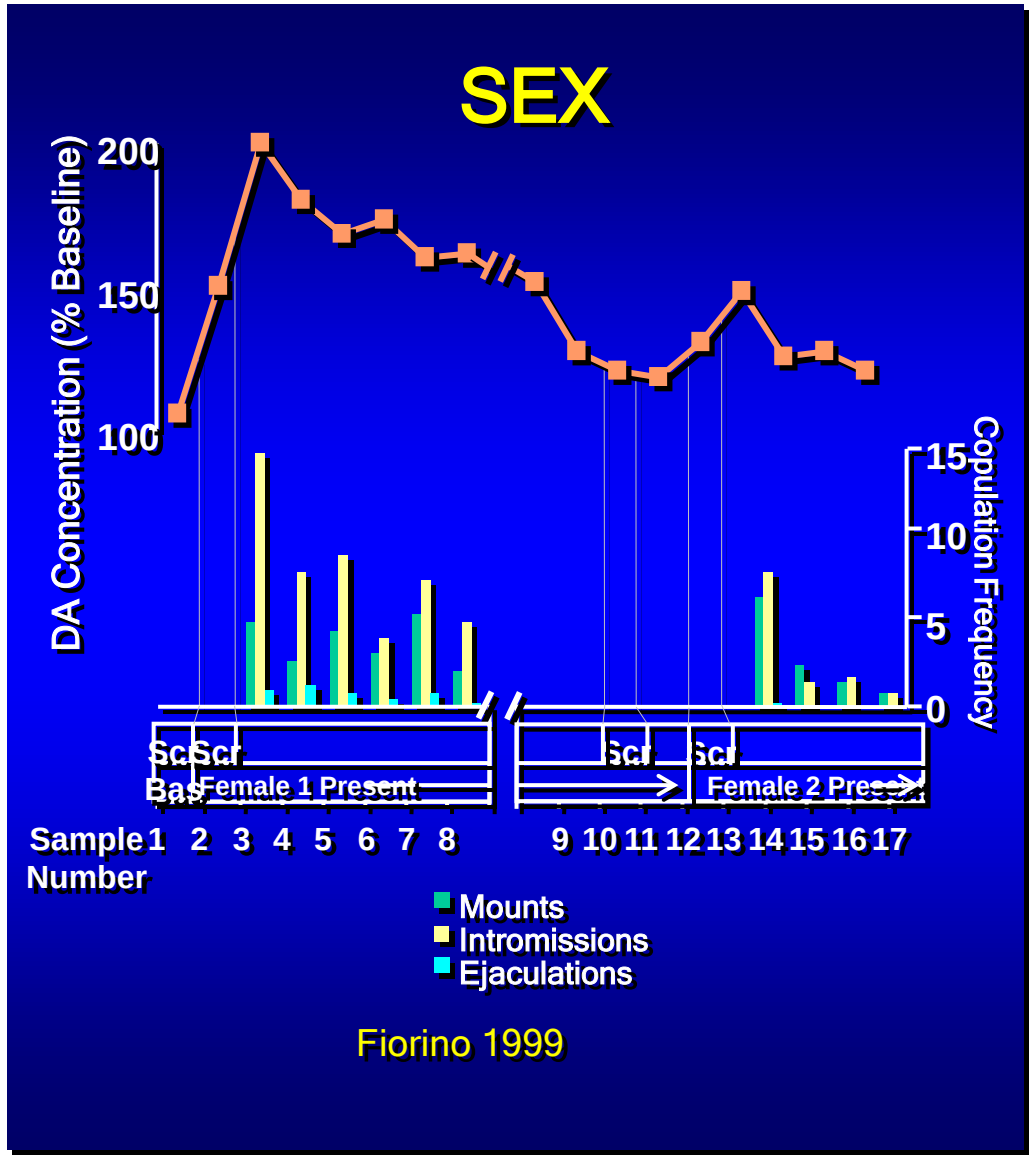
Let's First Take a Look at Normal Dopamine Functioning



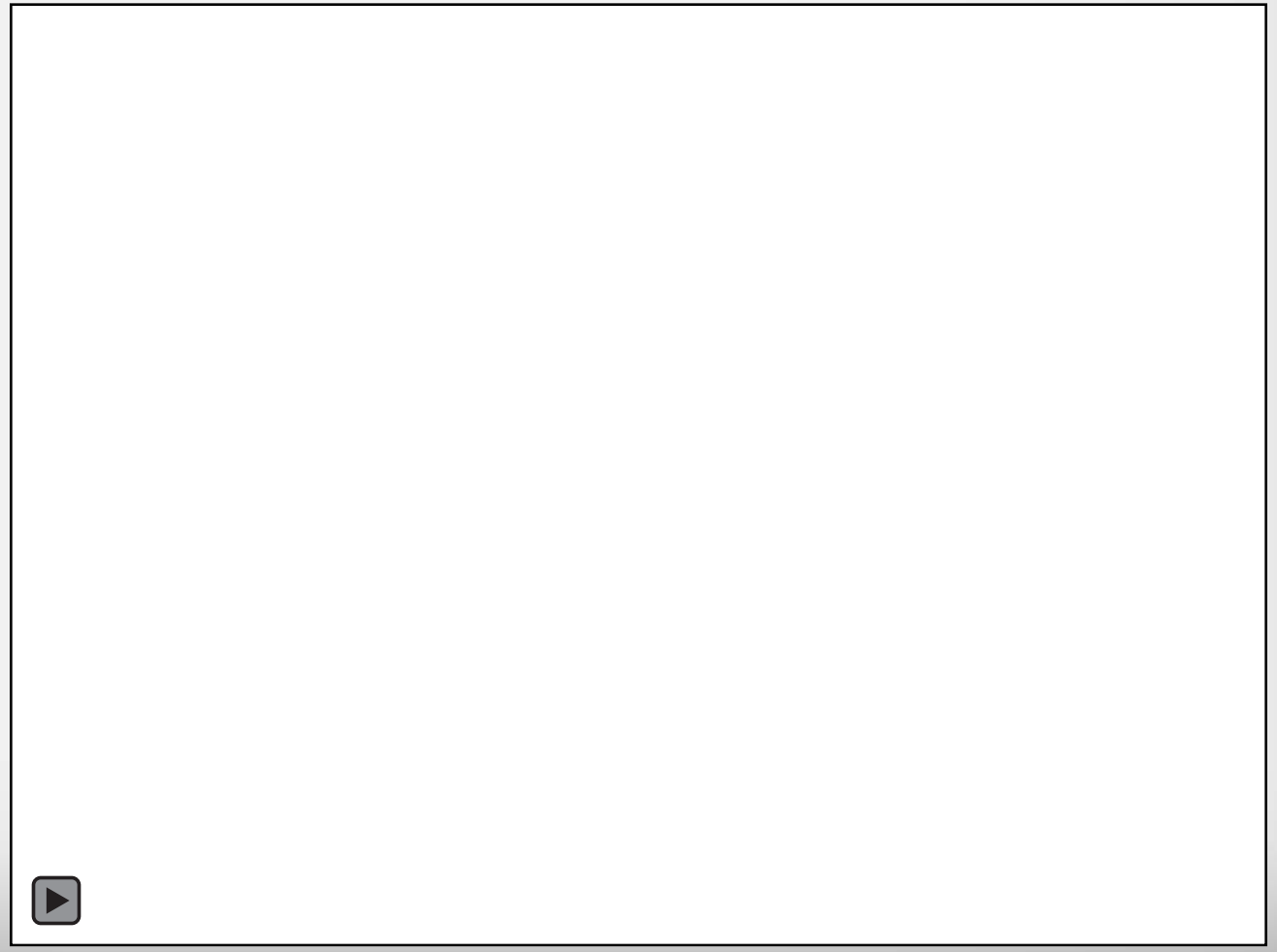
SOURCE: Meyers, 2008

Natural Rewards and Dopamine



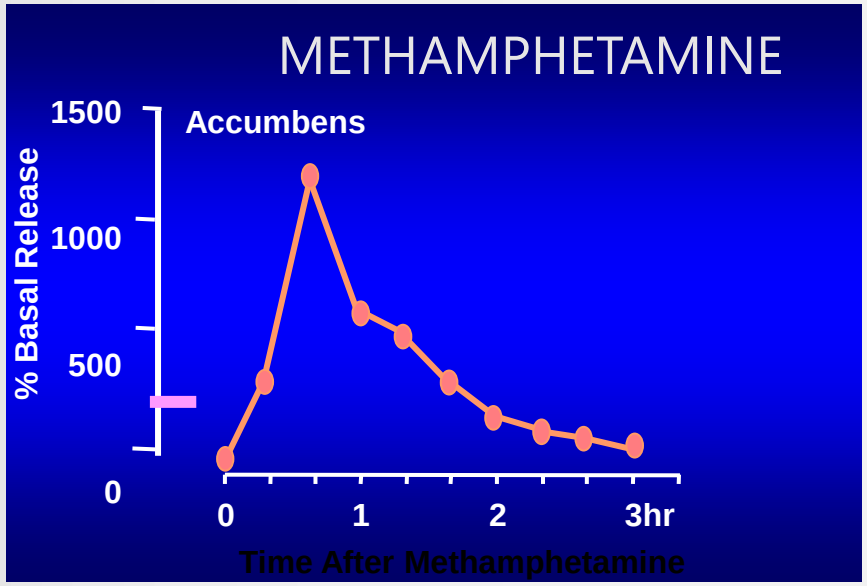


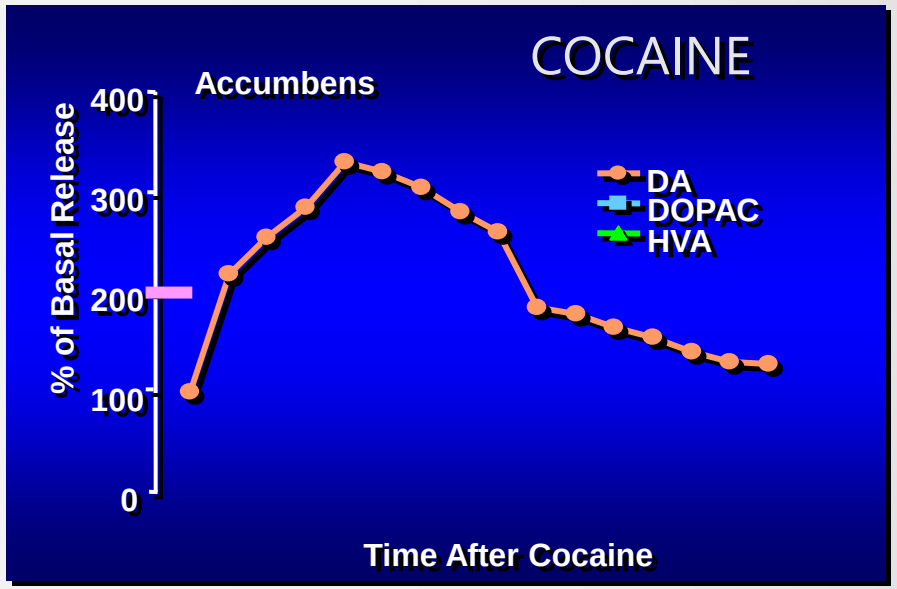
How the Brain Responds to Methamphetamine

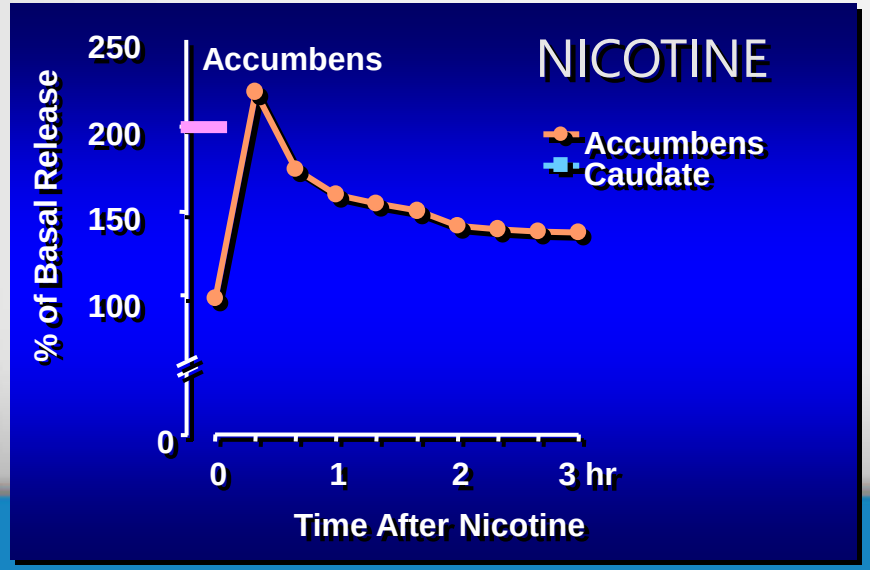


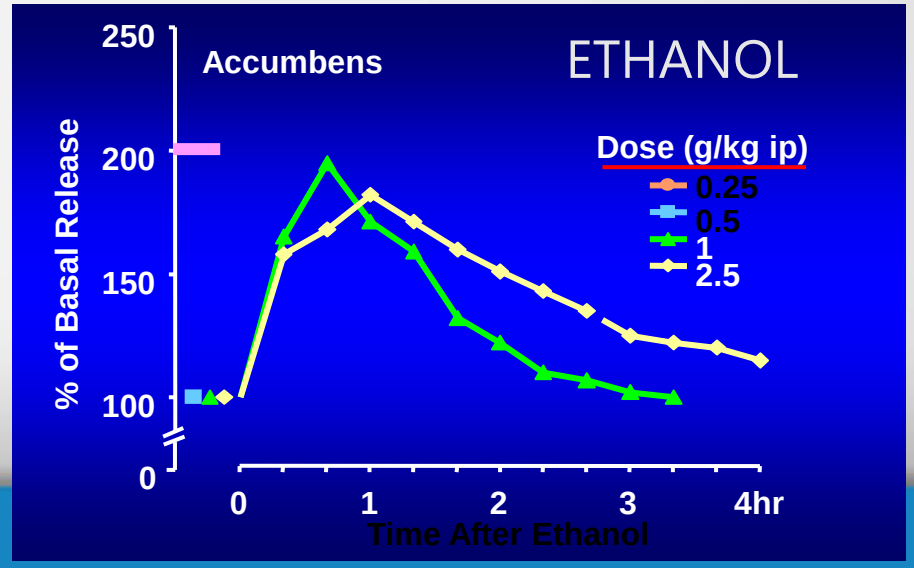
SOURCE: Meyers, 2008

Effects of Substances on Dopamine Release









Sources: Shoblock 2003; Di Chiara 1987

Classifying Psychoactive Substances

- Depressants: Slow down brain and nervous system activity. Calm nerves, relax muscles, encourage sleep.
- Stimulants: Increase brain and nervous system activity. Make users alert and encourage physical activity.
- Hallucinogens: Interfere with brain and nervous system, distort perceptions of reality. Users see/hear things that aren't really there.

ALCOHOL

- Alcohol or ethylalcohol (ethanol) is present in varying amounts in beer, wine, and liquors
- Is consumed orally (drunk)

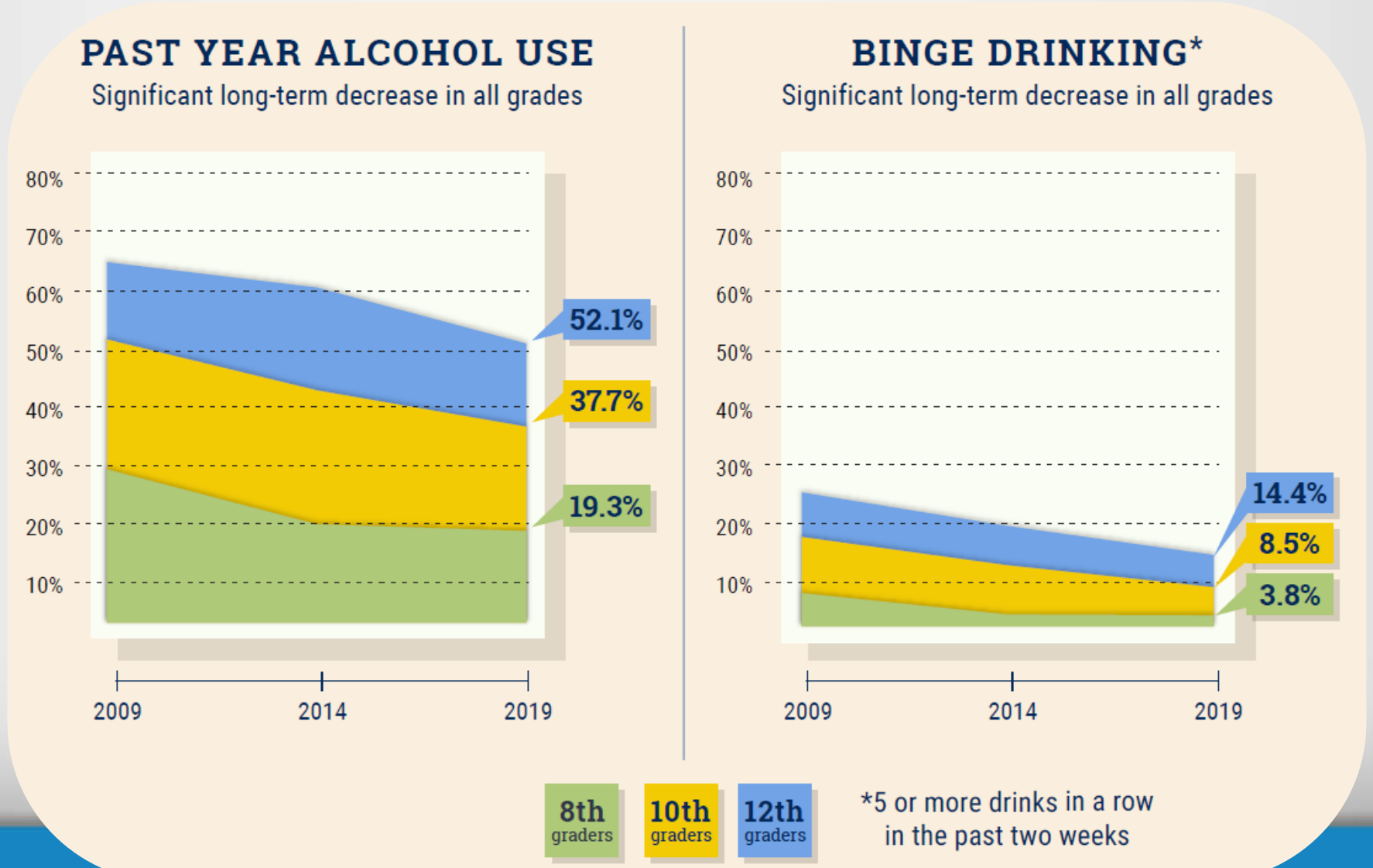
ALCOHOL

- The Party!
  - Stimulates release of endogenous opioids (deaden pain, cause euphoria)
  - Opioid activity stimulates dopamine release (pleasure)

- The Sloppy
  - Stimulates release of GABA, which slows us down
  - Leads to difficulty with coordination, drowsiness, slurred speech
  - Reduces inhibition

Source: Cruz, No Date

Substance Use Trends in School Populations



Source: National Institute on Drug Abuse, 2019

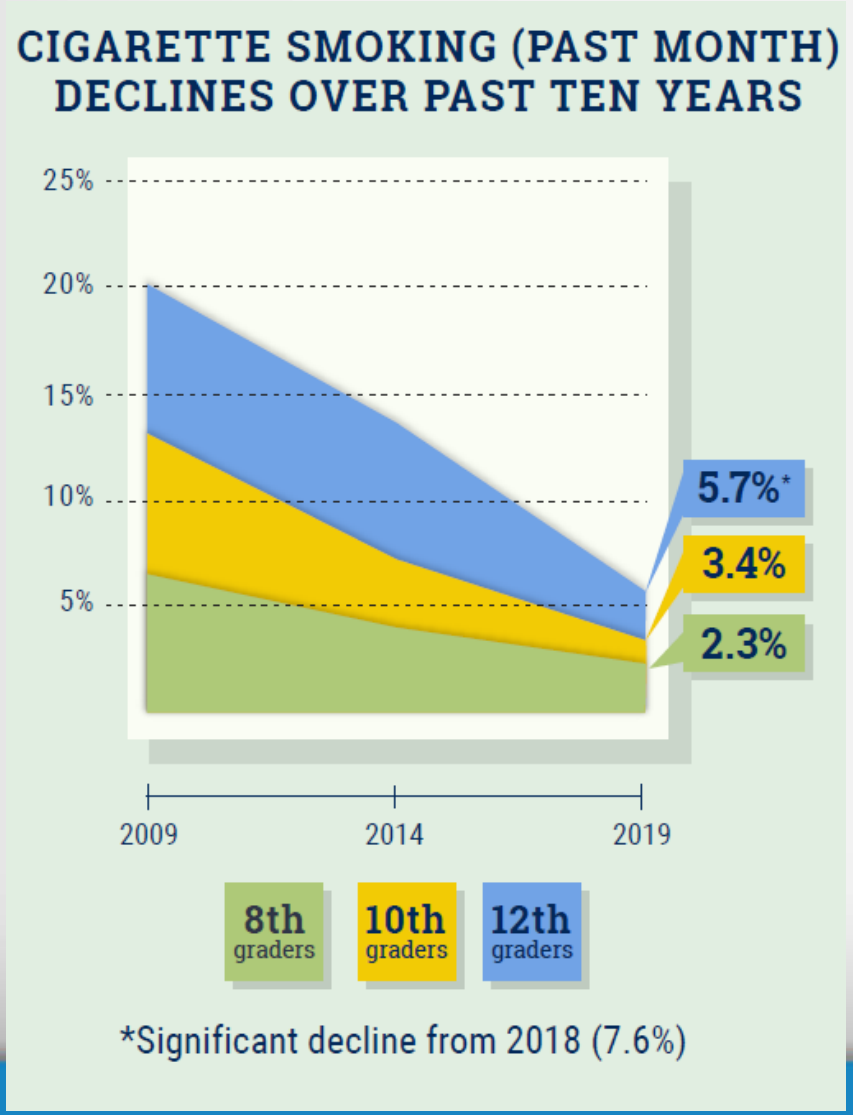
Tobacco Products

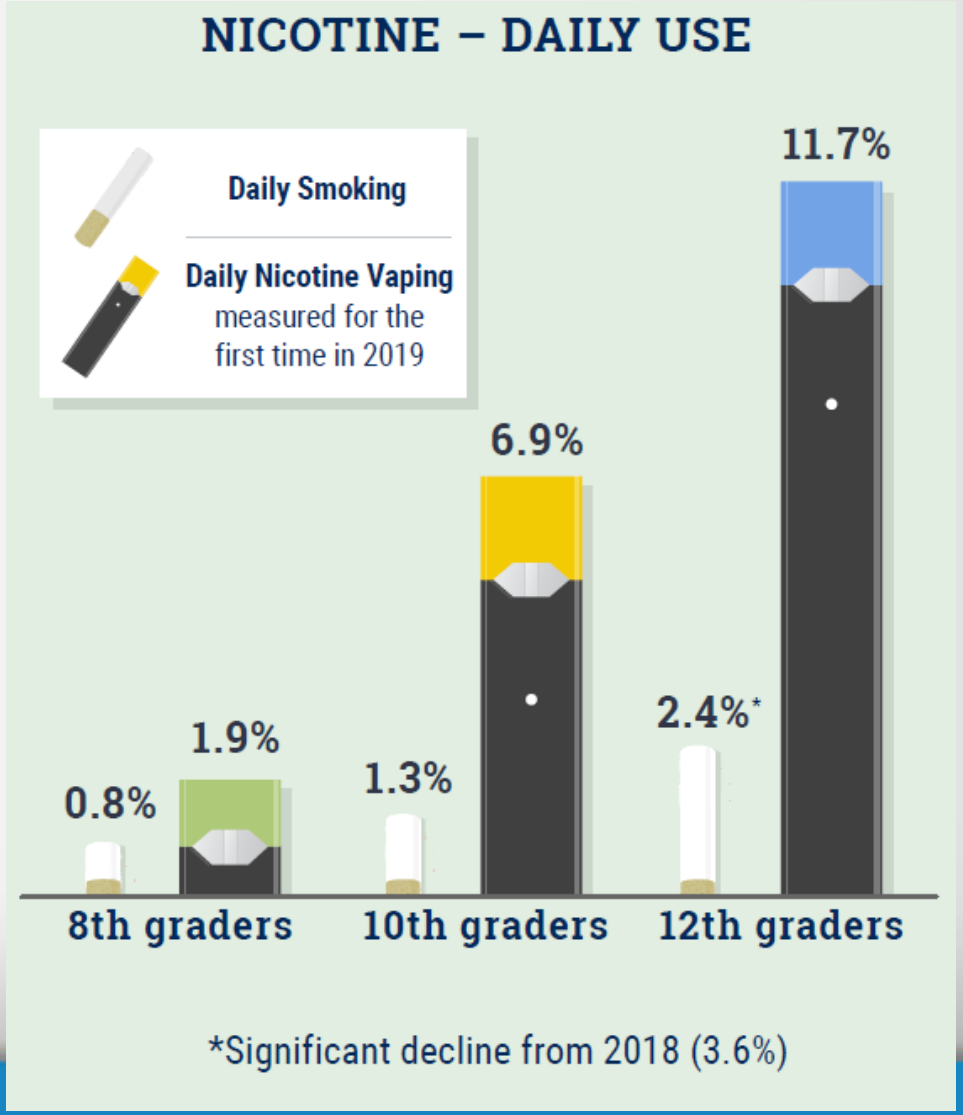
- Tobacco: leafy plant grown around the world.
- Many chemicals found in tobacco leaves or created by burning them (as in cigarettes).
- Nicotine is the ingredient that can lead to addiction.
- Other chemicals produced by smoking, such as tar, carbon monoxide, acetaldehyde, and nitrosamines, also can cause serious harm to the body.

Tobacco and Nicotine Products

- Tobacco and nicotine products come in many forms.
- People can smoke, chew, sniff them, or inhale their vapors.
- Electronic cigarettes are battery-operated devices that deliver nicotine and flavorings without burning tobacco.
- In most e-cigarettes, puffing activates the battery-powered heating device, which vaporizes the liquid in the cartridge.
- The resulting vapor is then inhaled (called “vaping”)
  - JUUL: an e-cig that can be disclosed in a closed fist (example: vape pens, flash drives)

Substance Use Trends in School Populations





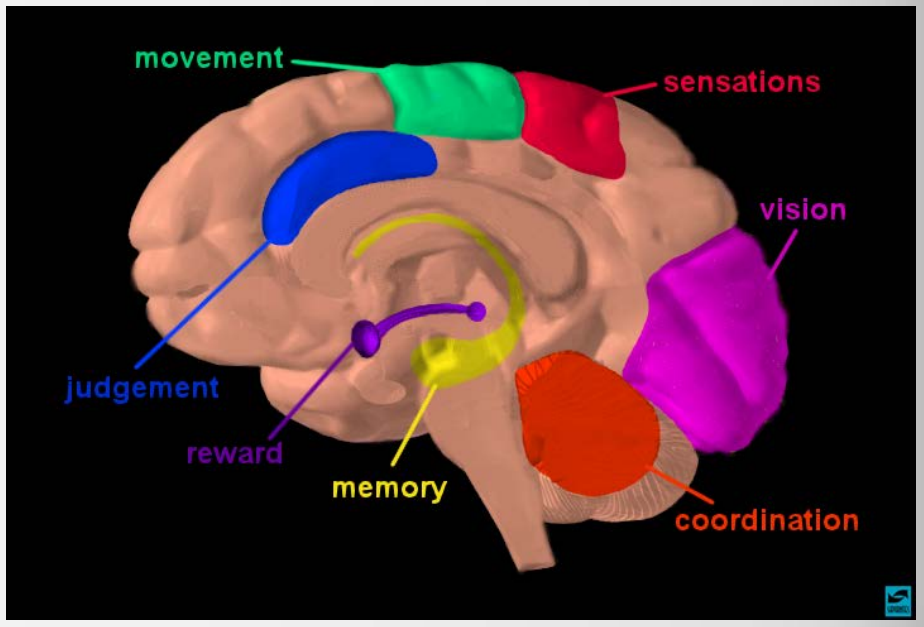
Source: National Institute on Drug Abuse, 2019

Polling Question:

Is smoking marijuana less dangerous than smoking cigarettes? Yes or No?

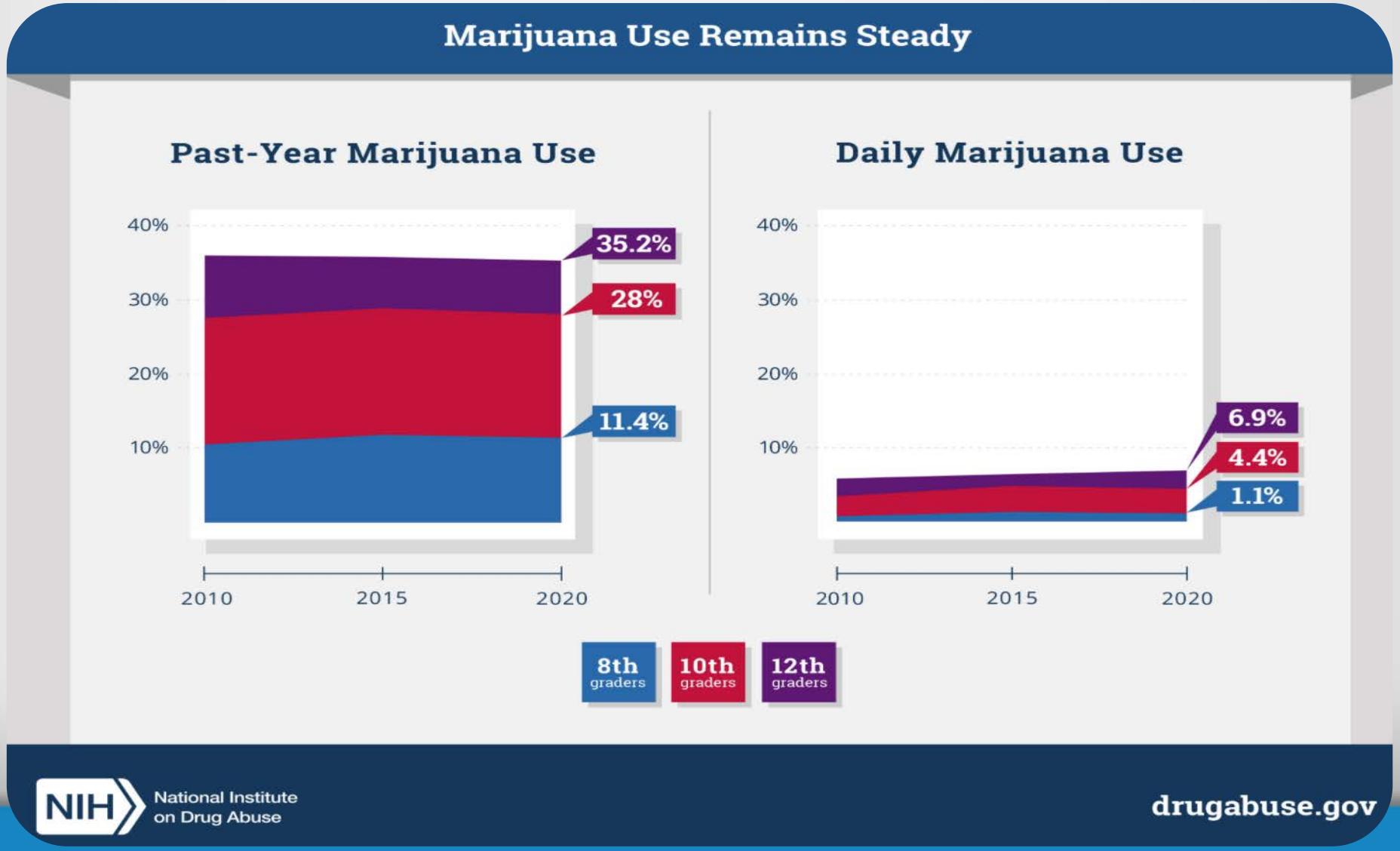
What Psychoactive Substances Do: Other Neurotransmitters and Functions

- Serotonin: regulates mood and sleep
- Opioids: deaden pain, cause euphoria
- Glutamate: speeds things up
- GABA: slows things down



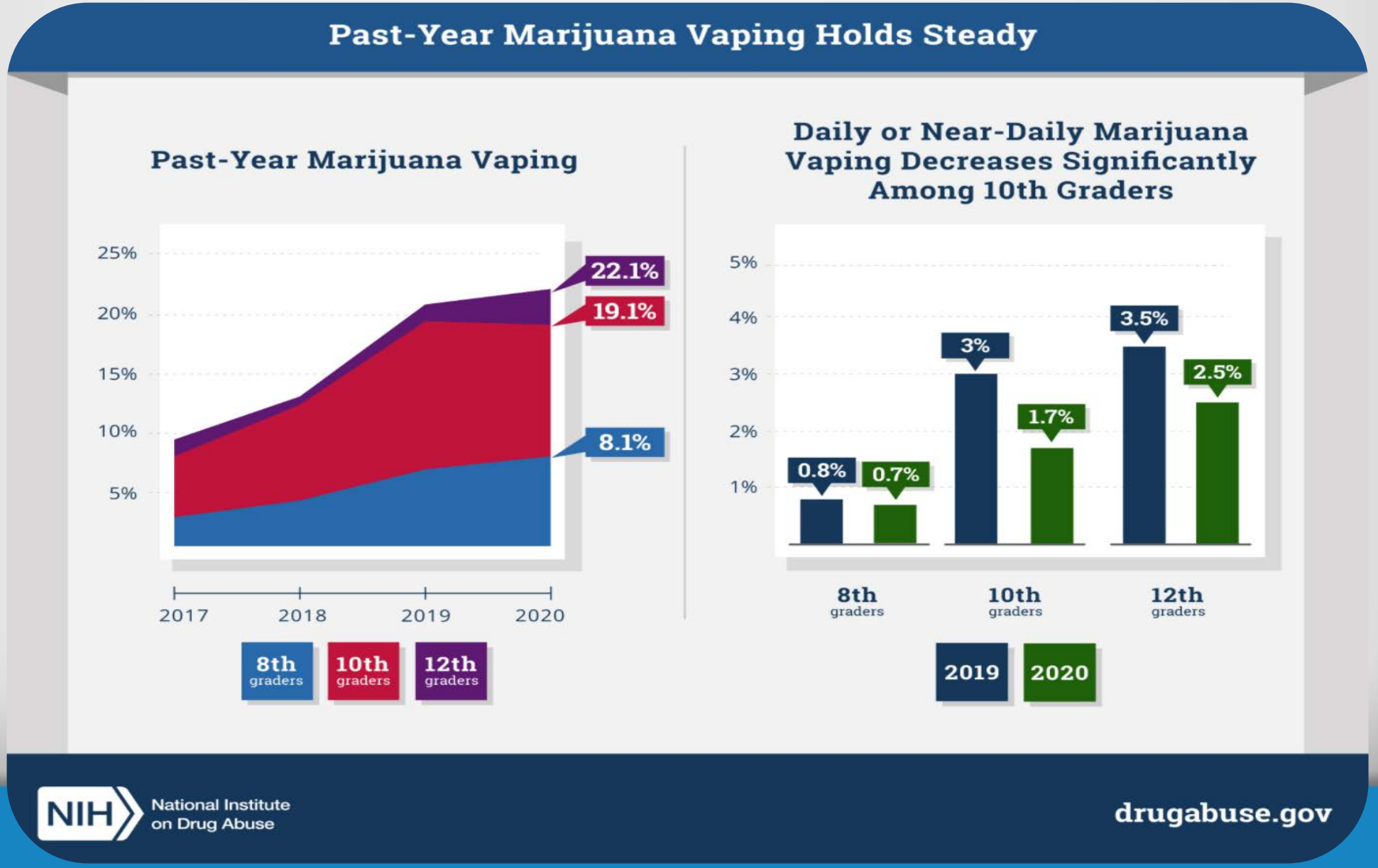
- Act in parts of the brain that control different functions

Substance Use Trends in School Populations



Source: National Institute on Drug Abuse, 2019

Substance Use Trends in School Populations



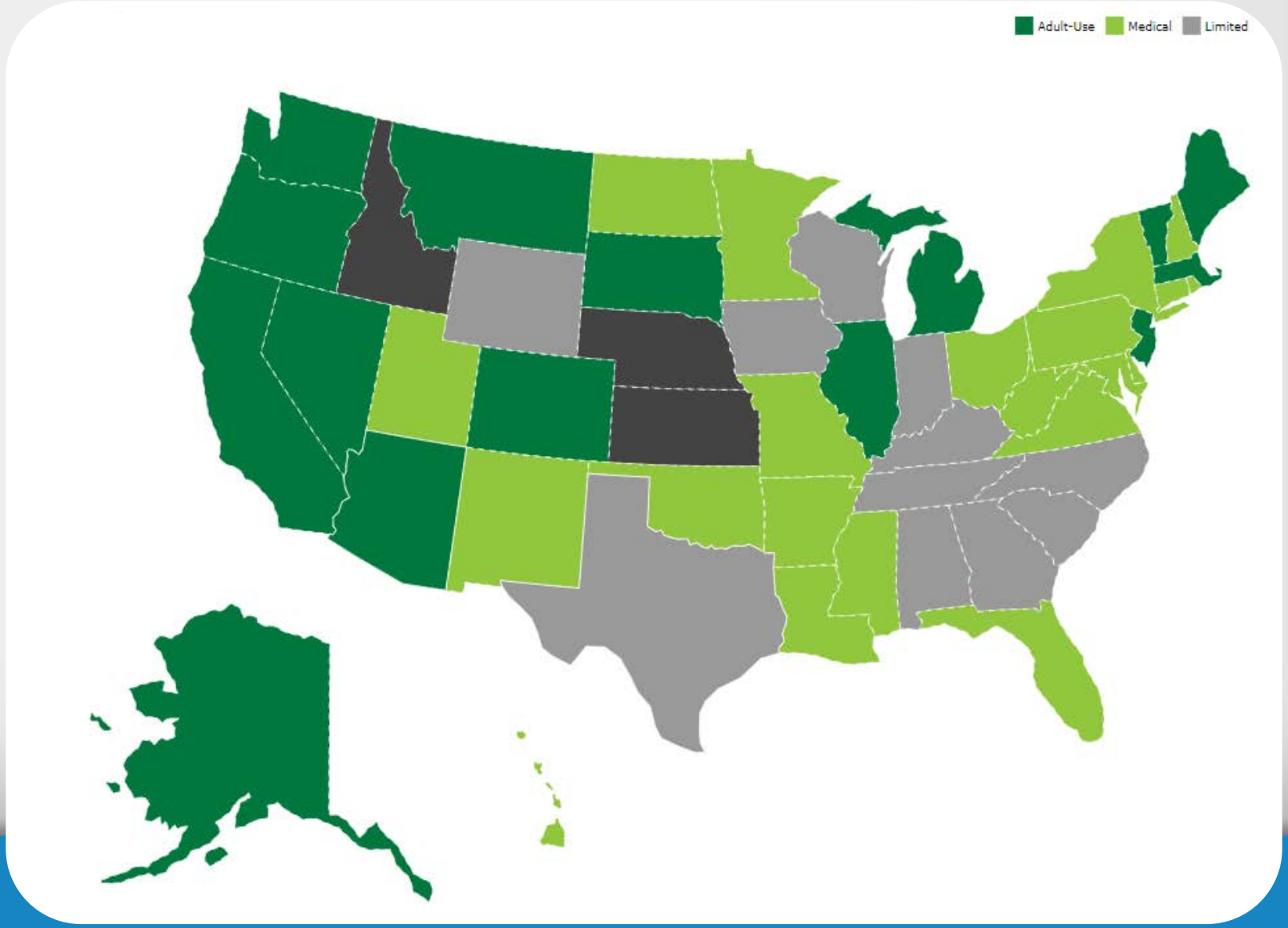
Source: National Institute on Drug Abuse, 2019

Marijuana: What is it?

- Dry, shredded mix of leaves, flowers, stems, and seeds, usually from *Cannabis sativa* or *Cannabis indica* plant
- Both are common subspecies of the hemp plant, which is common throughout the world
- Contains over 400 chemical compounds
- Common names: grass, weed, pot, reefer, Mary Jane, ganja

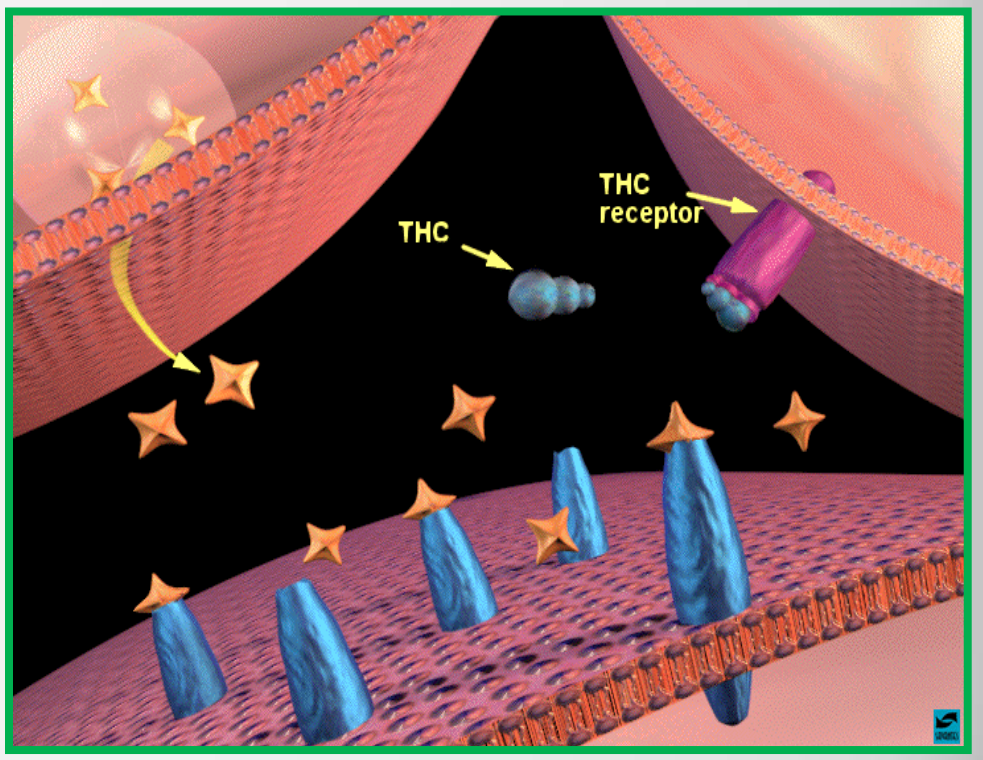
Source: SAMHSA, 2012 (reference list).

Recreational and Medical Use of Cannabis in the U.S.



CANNABIS

- Contains over 60 cannabinoids: main psychoactive chemical is Δ-9-tetrahydrocannabinol (THC)
- THC's molecular structure is similar to neurotransmitters that affect cannabinoid receptors (pain, appetite, vomiting reflex)
  - THC medications for cancer, HIV
  - Medical potential still being investigated (not just THC)
- Stimulates "high" through dopamine release, receptors in parts of brain that influence pleasure, memory, thinking, concentration, coordination



Source: National Institute on Drug Abuse 2017

How is Marijuana Used?

SMOKED	VAPORIZED	EATEN/DRUNK
Smoked in a pipe, bowl, cigarette	Inhaled through machine that converts active compounds into inhalable form	Consumed as ingredient in baked goods, candies, sodas
Rapid effects	Rapid effects	Takes time to reach brain, so effects are delayed
Burning marijuana releases toxins that can cause pulmonary problems	Does not release toxins that cause pulmonary problems	Does not release toxins that cause pulmonary problems

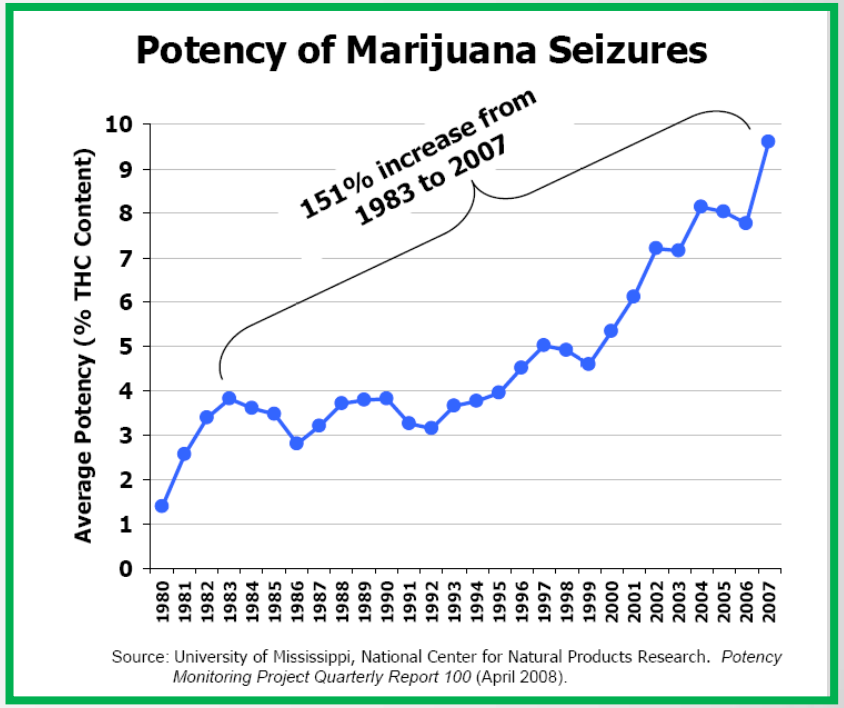
Source: University of Utah, 2018.

CANNABIS

It's not your Dad's pot anymore!

In 1960s-70s average THC concentrations were 1-2%.

Today, they are as high as 20%



Source: Kleber 2012

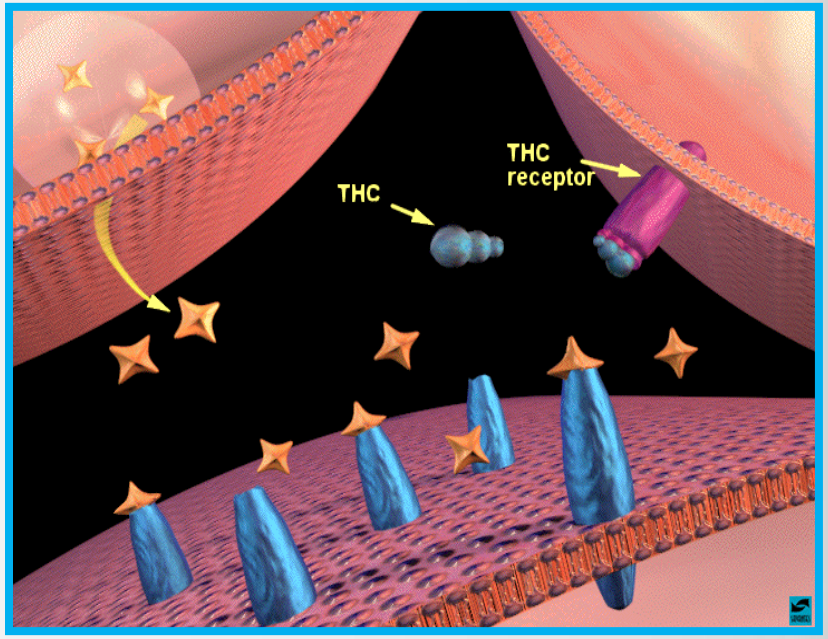
Marijuana: Other Forms

- Hashish
  - Compressed resin of cannabis plant
  - More concentrated and potent than marijuana plant
- Hash Oil ("Wax")
  - Psychoactive chemicals extracted from cannabis plant with butane
  - Three to four times as potent as marijuana plant
- Synthetic Marijuana ("Spice", "K2")
  - Herbal and chemical mixtures that produce experiences similar to marijuana
  - The five most common active chemicals in synthetic marijuana are now illegal in the U.S.

Source: NIDA, 2018; DEA, 2017; Hallett, 2013.

Marijuana: How Does it Work?

- Contains over 60 cannabinoids: main active chemical is Δ-9-tetrahydrocannabinol (THC)
- Stimulates "high" by triggering receptors in parts of brain that influence pleasure, memory, thinking, concentration, coordination
- THC's molecular structure is similar to that of neurotransmitters that affect cannabinoid receptors (affect pain, appetite, vomiting reflex)
- Effects generally last 1-4 hours



Sources: Eddy, 2010; NIDA, 2012a, 2012b.

Marijuana: Immediate Effects

- Effects can vary by strains
  - *Sativa*: More euphoria, stress relief
  - *Indica*: Relaxation, physical (especially pain) relief
  - *Sativa* and *Indica* often combined, leading to variable effects

Altered Mood	Reduced Anxiety
Cognitive Impairment (Attention, Judgment)	Sedation/Drowsiness
Altered Perception	Sensory Intensification
Impaired coordination/balance	Increased heart rate
Hunger	Hallucinations (in large doses)

Sources: NIDA, 2016; NIDA, 2018.

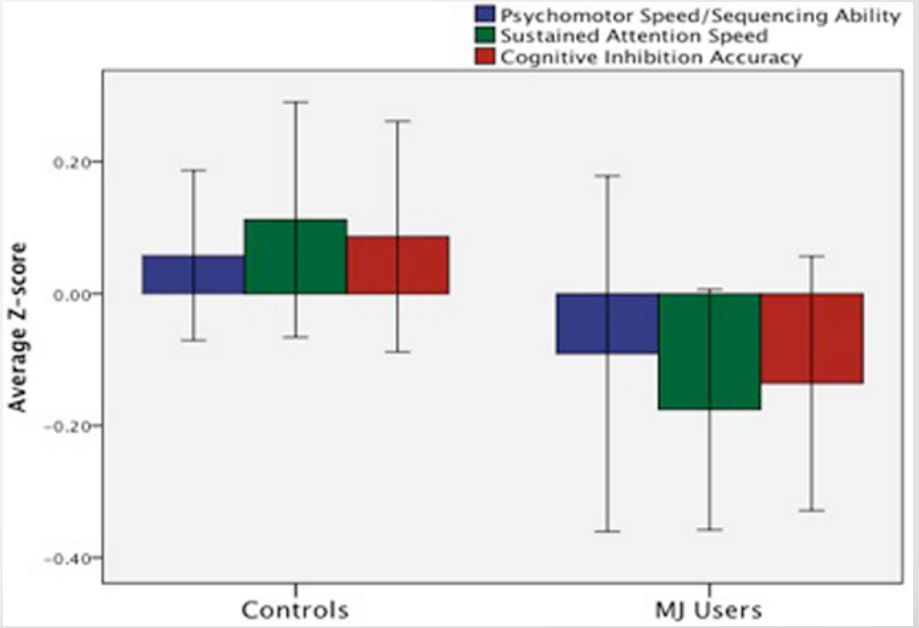
Acute Effects of Cannabis in Intoxication Phase

- Cognition
  - Difficulty with complex tasks
  - Difficulty learning
- Executive Function
  - Impaired decision making
  - Increased risky behavior – STDs, HIV
- Mood
  - Anxiety – panic attacks
  - Psychosis – paranoia

Source: Dr. Susan Weiss, NIDA, August 2017 National Cannabis Summit Keynote, Denver, CO.

Marijuana and the Adolescent Brain

- Human studies suggest early onset of use (prior to 16-18 years of age) is associated with more severe cognitive consequences:
  - Poorer attention (Ehrenriech et al., 1999)
  - Executive functioning (sustained attention, cognitive inhibition, abstract reasoning) (Fontes et al., 2011)



Source: Lisdahl & Price, 2012.

Marijuana and the Adolescent Brain

- Longitudinal research demonstrates that early onset marijuana use associated with lower IQ
  - Drop from childhood "average" to adult low "average"
  - Never achieved predicted adult IQ trajectory even with sustained abstinence in adulthood (Meier et al., 2012)
- Overall studies suggest that regular adolescent MT use may cause brain structural changes associated with poor neuronal efficiency
  - Poorer cognitive functions (psychomotor speed, executive functioning, emotional control, and learning and memory) (Lisdahl et al., 2013)
- This may indicate a large proportion of youth are experiencing cognitive difficulties that may negatively impact their performance, leading to increased school difficulty and reduced grades (Medina et al., 2007)

Sources: Meier et al., 2012; Lisdahl et al., 2013; Medina et al., 2007.

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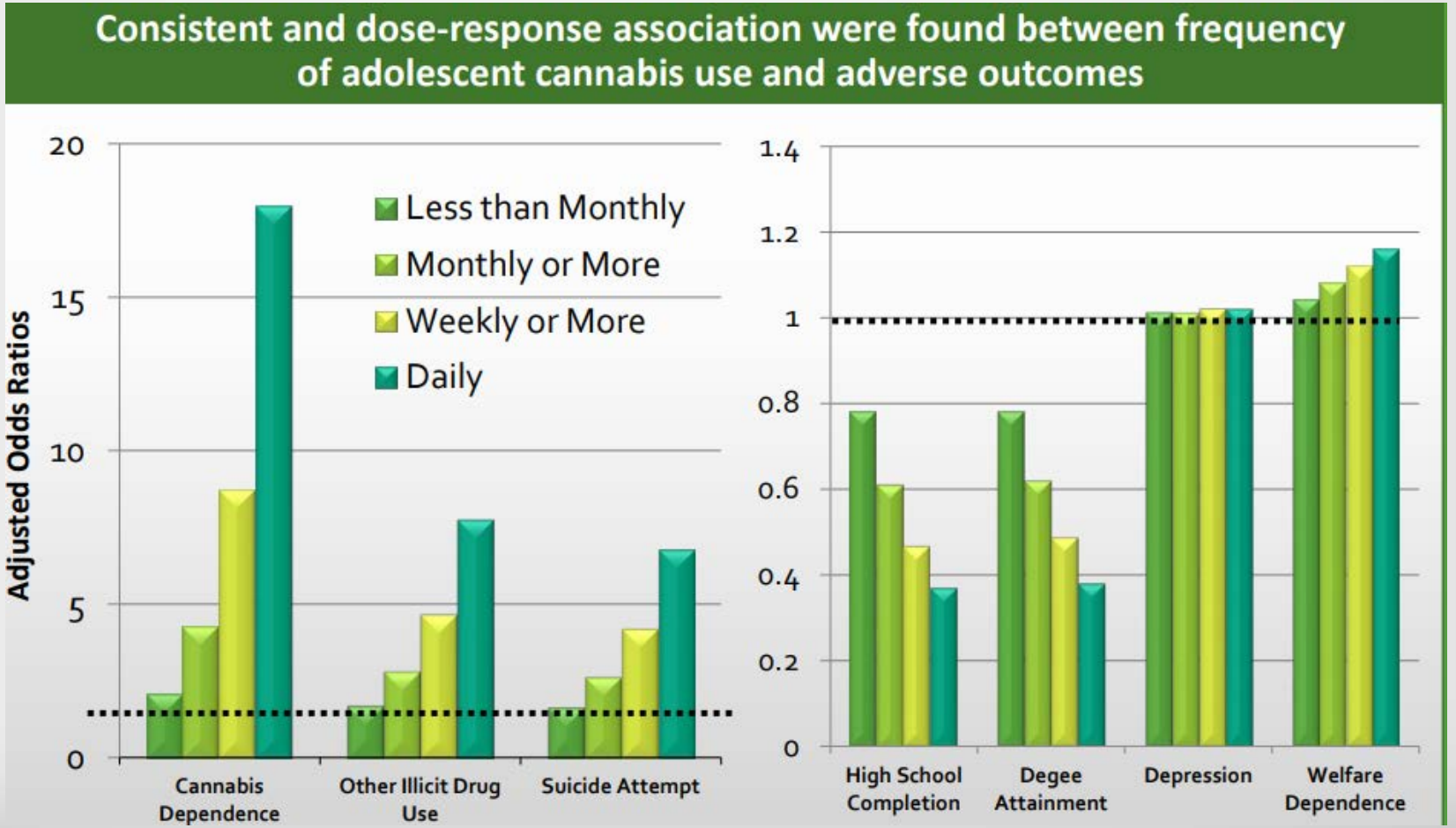
Frequency of Use during Teen Years and Adverse Outcomes



Source: Dr. Susan Weiss, NIDA, August 2017 National Cannabis Summit Keynote, Denver, CO.

Implications of Increased Potency on Health?

The Cannabis Plant
1990s approx. 2-4% THC
Today approx. 12-15% THC
Today about 5 mg THC/puff
Feel effects almost instantly

Most of our research is on this

Edibles
Cannabis plant as ingredient in food/drinks
About 10 mg THC per "serving"
Takes time to digest and feel high
Risk of overconsumption

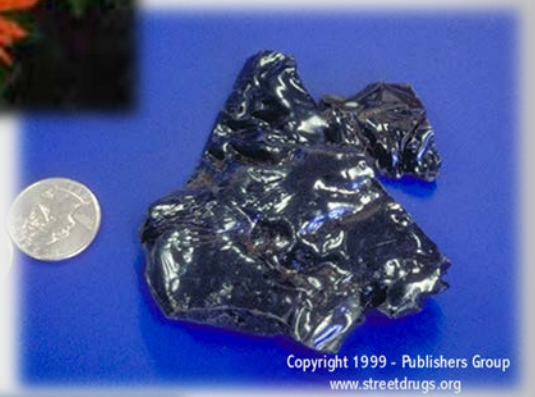
Extracts and resins (hash oil, wax, shatter)
Consumed via smoking, vaporizing
"Dabbing"
50-80% THC

But we may start seeing a lot more of this

Source: Slide courtesy of Howard Padwa, UCLA ISAP, 2018.

Opioids

- Compounds that bind to opioid receptors in the brain
- Opiates
  - Natural derivative of opium poppy (opium, morphine)
- Opioids
  - Semisynthetic (including heroin) or synthetic compounds
- Can be taken orally, sniffed, smoked, injected

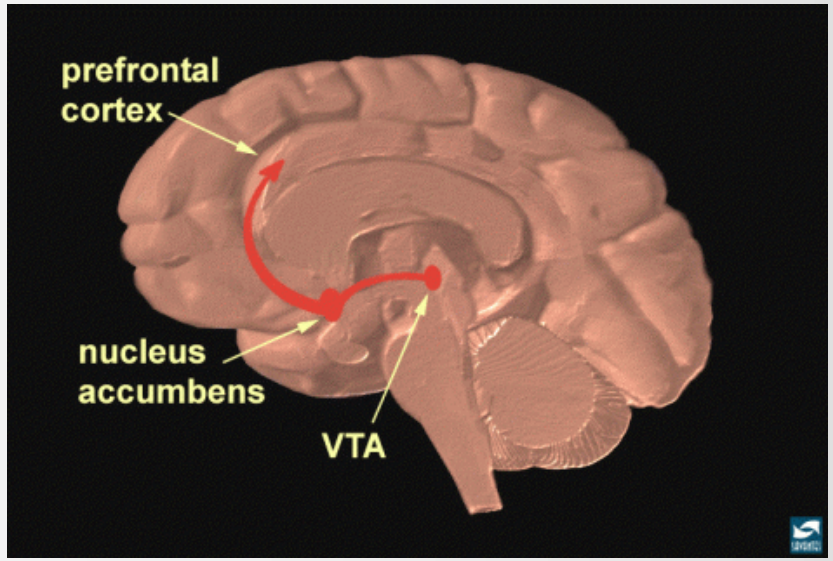


OPIOIDS

- Most commonly misused opioids are pharmaceuticals that are used for non-medical purposes
    - Oxycodone (Percocet ®, Oxycontin ®)
    - Hydrocodone (Vicodin®, Norco®)
    - Hydromorphone (Dilaudid®)
    - Oxymorphone (Opana ®)
    - Meperidine (Demerol®)
    - Methadone (Dolophine ®)
    - Fentanyl (Duragesic®)
- Proliferated with increased use to treat pain in 1990s and 2000s
- Line between "medical" and "non-medical" use is not always clear

Opioids

- Work by binding to opioid receptors, mimicking neurotransmitters the body naturally produces
  - Pain relief
  - Euphoria
- Stimulate release of dopamine
  - Pleasure
  - Sedation
- Stimulate release of GABA
  - Slows things down
- Acts in parts of brain in natural dopamine reward pathway



Source: National Institute on Drug Abuse, 2007

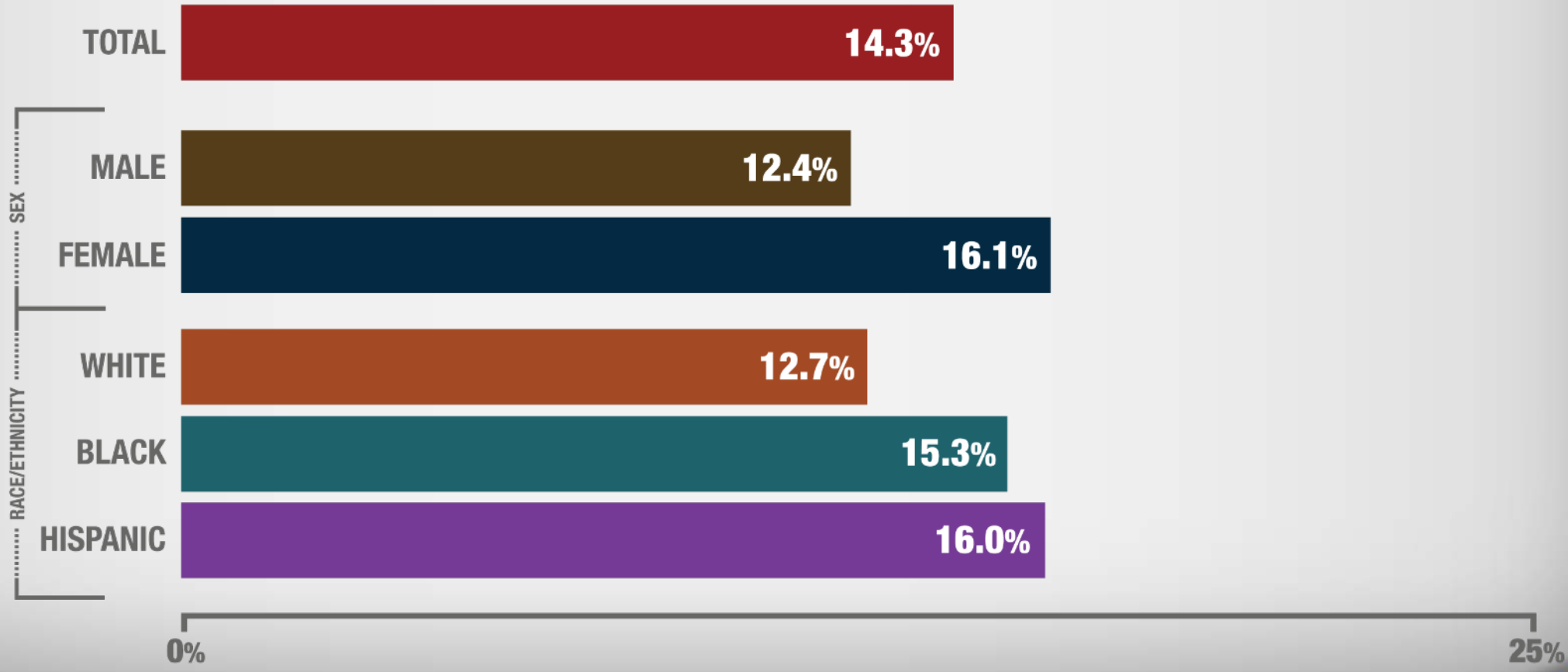
Lessons Learned from a BUP Trial with Young Adults

- Return to opioid use in longer term stabilization and short withdrawal groups were similar and concerning given
  - Young age
  - Short duration of opioid use
- Adult trials have consistently shown better outcomes with longer treatment
- Young adults will likely need long-term opioid agonist treatment
- Hepatitis C rates and conversion of 4 participants make need for treatment even more urgent

Sources: Fiellin, 2008; Woody, et al., 2008

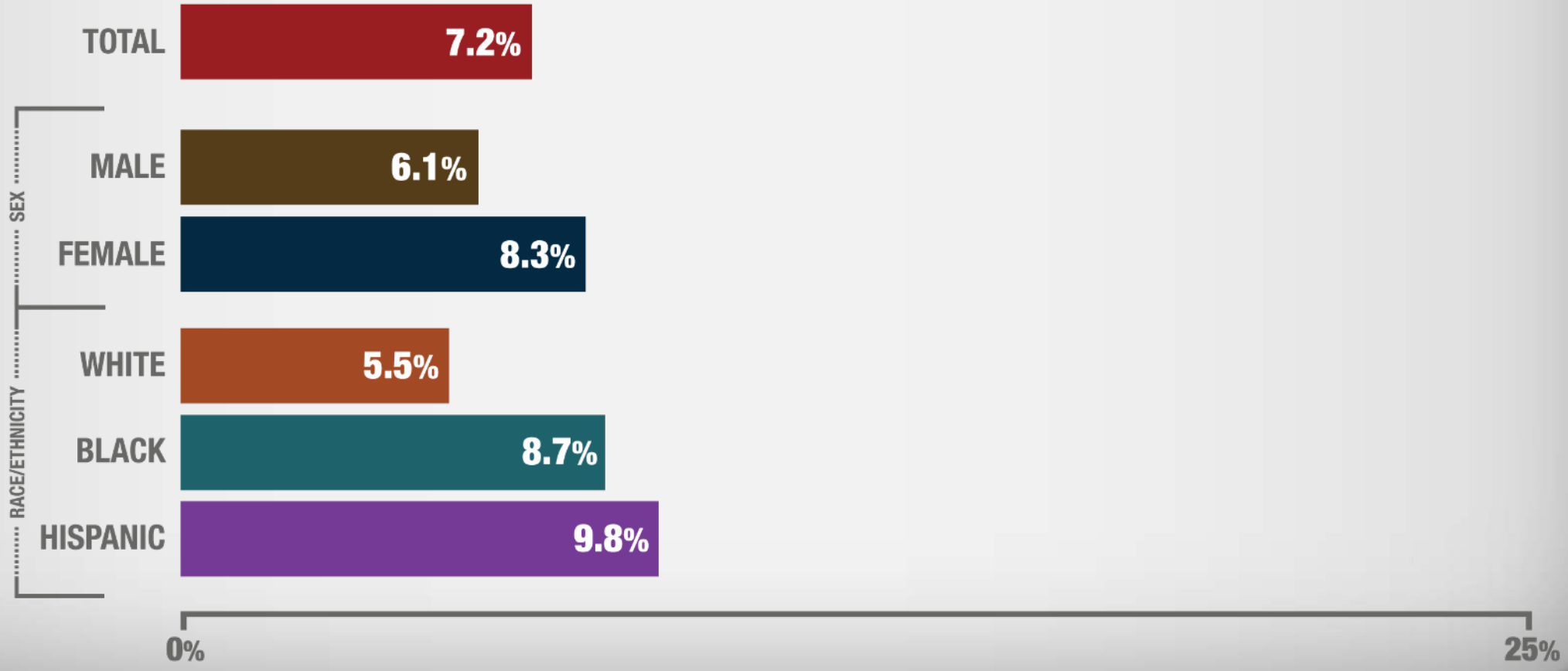
PERCENTAGE OF HIGH SCHOOL STUDENTS WHO

HAD EVER MISUSED PRESCRIPTION OPIOIDS, BY SEX AND BY RACE/ETHNICITY, UNITED STATES, YRBS, 2019

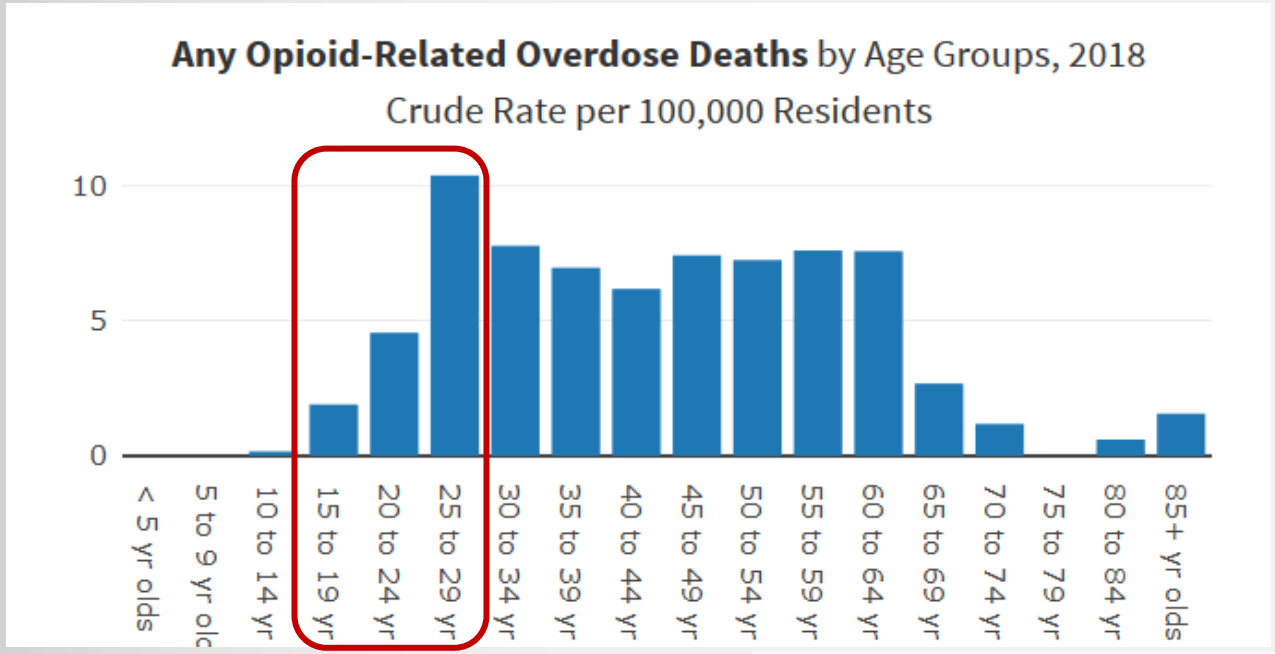


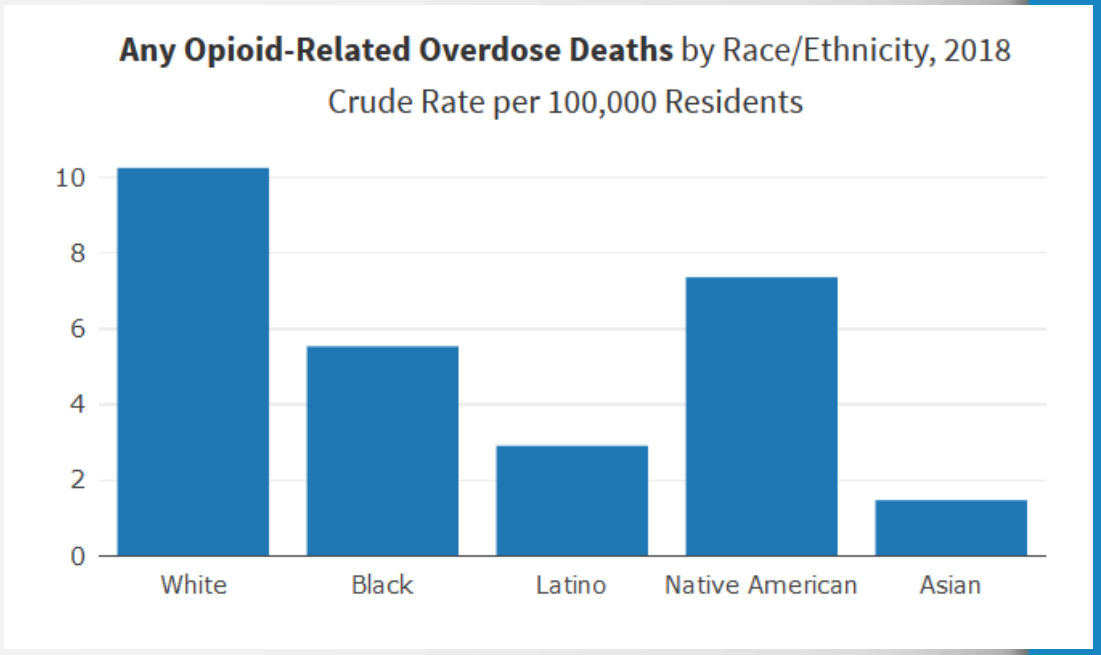
PERCENTAGE OF HIGH SCHOOL STUDENTS WHO

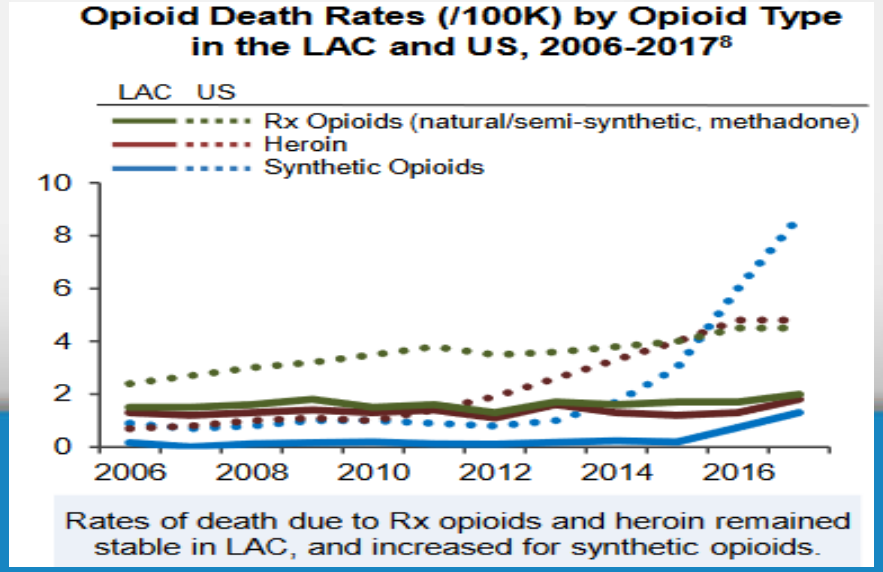
HAD MISUSED PRESCRIPTION OPIOIDS DURING THE PAST 30 DAYS, BY SEX AND BY RACE/ETHNICITY, UNITED STATES, YRBS, 2019



Overdose Deaths by Opioid Type: LA County







COCAINE/CRACK

- Stimulant derived from the coca plant
- Works by causing buildup of dopamine
- Causes euphoria, alertness, sensitivity to stimuli, irritability, paranoia
- Can be snorted, injected, rubbed on gums
- Crack: rock crystal form that can be smoked

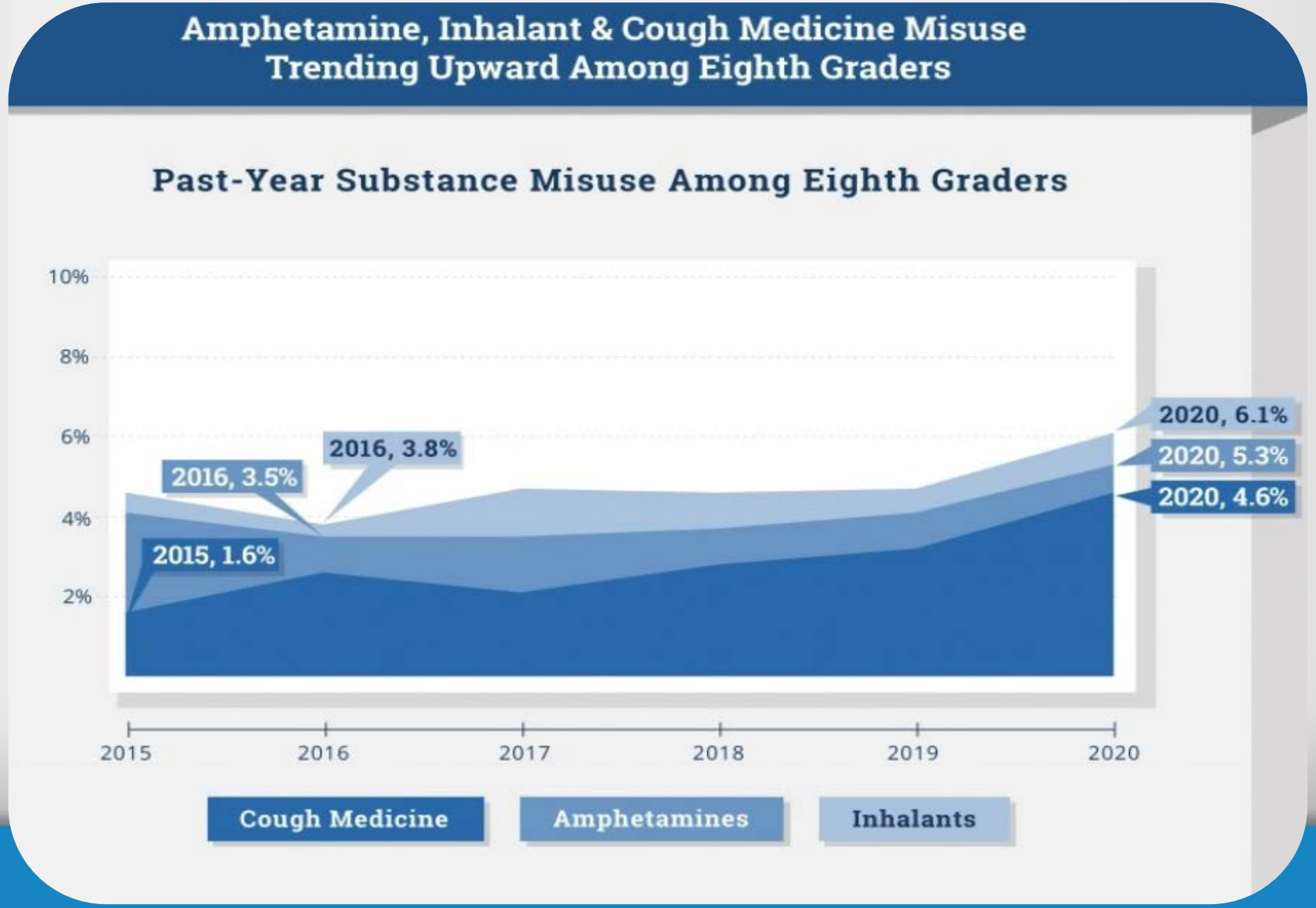
Source: National Institute on Drug Abuse, 2016b

METHAMPHETAMINE

- Synthetic drug that can be smoked, snorted, injected, consumed orally or rectally
- Causes rapid release of dopamine
- Euphoria when snorted, consumed orally
- When smoked/injected also causes an immediate rush
- Often used in “binge and crash” pattern

Source: National Institute on Drug Abuse, 2017b

Substance Use Trends in School Populations



Source: National Institute on Drug Abuse, 2019

HALLUCINOGENS

- Drugs that cause:
  - Distorted perception
  - See/hear/feel things that aren't there
  - Extreme mood swings
  - Sensory crossover (hear colors, see sounds)
- Work by acting on glutamate and serotonin
- Temporarily disrupt communication between brain chemical systems

Source: National Institute on Drug Abuse, 2016d

HALLUCINOGENS

SUBSTANCE	SOURCE	HOW USED
LSD (d-lysergic acid diethylamide)	Lysergic acid, found in a fungus that grows on grains (ergot)	Tablets, capsules, liquid
Peyote	Mescaline, found in cactus	Chewed, brewed in tea
Mushrooms (psilocybin)	Mushrooms found in SW USA, Latin America	Eaten, brewed in tea
PCP, Angel Dust (phencyclidine)	Synthetic	Snorted, smoked, orally ingested
DMT, Dmitri	Amazonian plants	Swallowed, smoked
Ketamine	Synthetic	Swallowed, snorted, injected
Salvia	Plants in Latin America	Eaten, drunk, smoked

Inhalants

- Not a specific set of drugs, but a method of consuming fumes, vapors, or gases
- Can be done with over 1,400 types of ordinary products
  - Solvents: Liquids that vaporize at room temperature
  - Aerosol sprays
  - Gases (butane, medical anesthetics like chloroform and nitrous oxide “laughing gas”)
- Various modes of consumption
  - Consume chemicals directly into nose or mouth (huffing)
  - Inhale from balloon or bag
  - Place chemical-soaked rag in mouth

INHALANTS

- Most produce pleasurable effect by slowing down brain activity
- Some work by expanding and relaxing blood vessels
- Effects last less than a few minutes

EFFECTS OF INHALANTS (Vary by product)
Euphoria
Dizziness
Lightheadedness
Hallucinations
Stupor
Delusions
Lack of coordination
Numbness
Loss of Consciousness

Other Synthetic Drugs

- These aren't really "Spice", "Incense" or "Bath Salts"—they are complex chemicals that have strong psychoactive effects
- Constantly changing composition to stay legal
- Sometimes labeled to indicate "not for human consumption" (legal loophole)

Source: National Institute on Drug Abuse, 2017d

Synthetic Cannabinoids ("Spice" "K2")

- Herbal and chemical mixtures that produce experiences similar to cannabis
- Mainly smoked
- Reasons for popularity
  - Have psychoactive effects
  - Available in retail stores, online
  - Highly attractive packaging
  - Perceived as safe
  - Not easily perceptible in blood/urine tests
- The five most common active chemicals in synthetic marijuana are now illegal in the U.S.

EFFECTS SIMILAR TO CANNABIS	EFFECTS NOT SEEN WITH CANNABIS
High heart rate	Seizures
Red eyes	Hypertension
Sedation	Nausea/Vomiting
Hallucinations	Agitation
Memory Deficits	Violent Behavior

Sources: Hermanns-Clausen 2013; Rosenbaum 2012; Forrester 2011; Schneir 2011

Synthetic Cathinones ("Bath Salts")

- Cathinones: mild stimulants found in khat plant from Africa and Middle East
- Unknown how they impact the brain, but chemically similar to amphetamines, cocaine, MDMA
  - Increases heart rate ten times more than cocaine
- Effects
  - Increased energy, sociability, sex drive
  - Paranoia and hallucinations
  - Panic attacks and delirium

Source: National Institute on Drug Abuse, 2016e

Developing a Vision for a Youth Centered System of Care in Los Angeles County

Youth Stakeholder Interviews

- The research team conducted semi-structured interviews with 14 youth (under the age of 21) who receive publicly funded SUD services within Los Angeles County.
- Youth were asked their insight in enhancing positive experiences in programs, as well as issues that have arisen from COVID-19

Provider Stakeholder Interview Themes

Uptake of Different Outreach Strategies

- Recommended strategies included **advertising services** on social media, as well as billboards and flyers near schools, hospitals, drop-in centers, juvenile halls, and homeless shelters.
- "Outreach efforts needs to be **announcing, not pressuring** as if youth have to go to treatment."

Use of Innovative Engagement Strategies

- Having "trusted **peer-advocates**"
- Make a **space inviting** and somewhere that youth want to be and can make friends, [someplace] that feels safe.
- **Incentives**: "If you say we're giving away this or that if you come through…you'll walk away with a $10 Target gift card they'll come running."

Youth-Friendly Treatment Services

- **Individual** therapy and **family** therapy are the most helpful services
- Treatment providers should use formats that are "**conversational**" and **respect choice**, and not "like a punishment, lecture, judgment, or education on moral shaming about how bad personal substance use is."

Challenges and the Impact of COVID-19
Themes from Youth Voices

- Youth participants mentioned that a major impact of COVID-19 has been the **shift** from in-person services/treatment **to the use of virtual platforms** for individual sessions and groups.
- Youth participants indicated that it could be beneficial to **reach out to parents directly** to educate them about the prevention and treatment services available since referrals from school are not currently happening.
- Youth participants shared that COVID has made it **harder to address basic survival needs** for youth and families, especially those who rely on public funding and income supports.

Navigating COVID-19 Impacts

Results from the COVID-19 Response and Preparedness survey highlighted several key issues:

- Significant impact in the **financial health of youth organizations**. Over half of providers are at great risk of closure in the coming months because of the pandemic's financial consequences.
- **Reduced capacity** to provide youth services, with some by more than 75%.
- **Difficulty engaging** youth and families in telehealth due to system capacity barriers as well as youth/family health disparity challenges.
- **Shifting service** efforts to address larger youth/family impacts of COVID in terms of **income stability and resources**.
- Implementing prevention efforts, **protecting staff and clients** against infection; however with limited systematic guidance on protocols.

In light of these findings, the researchers will be partnering with YSPG to tailor the CCAAP survey to collect youth system impacts specifically.

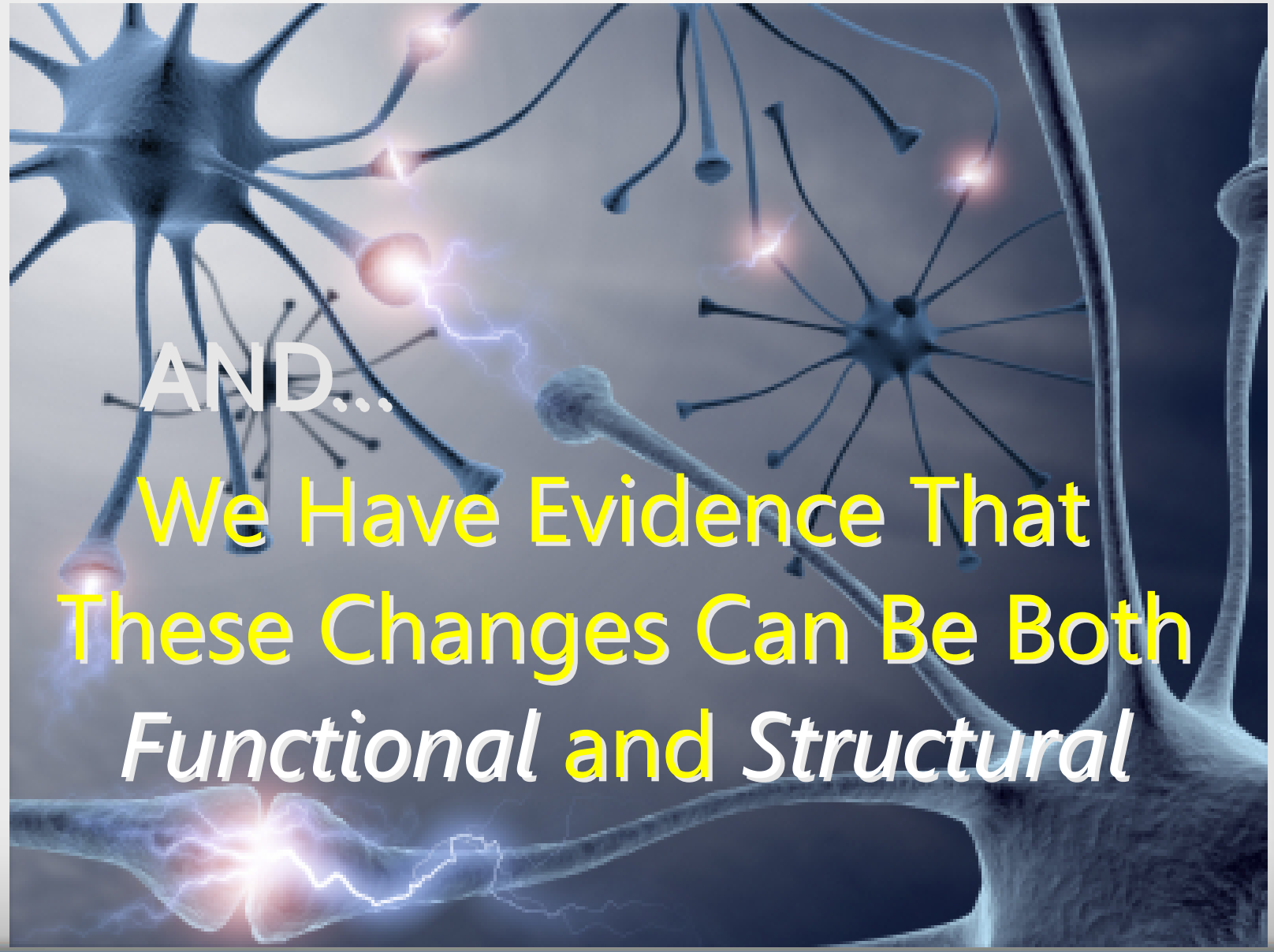
Take Away Points

- Psychoactive substance use is common among adults and adolescents
- Alcohol and marijuana are the most commonly used substances
- Main reasons people use psychoactive substances are to feel good and to feel better

When Substance Use Becomes Problematic

- Negative impacts of substance use begin to outweigh the benefits
  - Substance effects that are unpleasant or harmful
  - Consequences of things done while intoxicated
  - Impact on individual, friends/family, or society
  - Health impacts
    - Overdose
    - Substance use disorders
    - Impact on mental health
    - Impact on physical health


Prolonged Drug Use Changes
The Brain In Fundamental and
Long-Lasting Ways


AND…
We Have Evidence That
These Changes Can Be Both
Functional and *Structural*

Questions? Comments?

RESOURCES

YSBIRT.org

Youth SBIRT

NATIONAL COUNCIL FOR BEHAVIORAL HEALTH

CONRAD N. Hilton FOUNDATION

adolescentsubstanceuse.org

adolescent SUBSTANCE USE

teens.drugabuse.gov

NIDA FOR TEENS
THE SCIENCE BEHIND DRUG USE

FACILITATING CHANGE FOR EXCELLENCE IN SBIRT

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