



Marijuana 101

Maine AAP April 30, 2023

Marijuana Cannabis which is it

- ♦ DEA Lists as Marijuana = “Marijuana is a mind-altering (psychoactive) drug, produced by the Cannabis sativa plant. ”
- ♦ Used interchangeably
Goes by many street names Refer/ weed/dope/
- ♦ Hemp is strain of Cannabis sativa that legally is less than 0.3% THC

Cannabis is a plant

- ♦ Cannabis sativa
- ♦ Cannabis indica
- ♦ Cannabis ruderalis

- ♦ More than 550 molecules including alkaloids/
carotenoids/flavonoids/lignanamide/

- ♦ Cannabinoids- Cannabidiol and Δ -9-Tetrahydrocannabinol

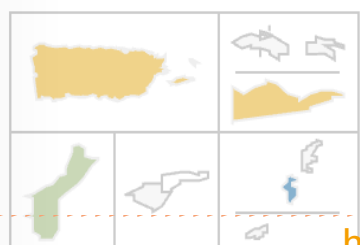
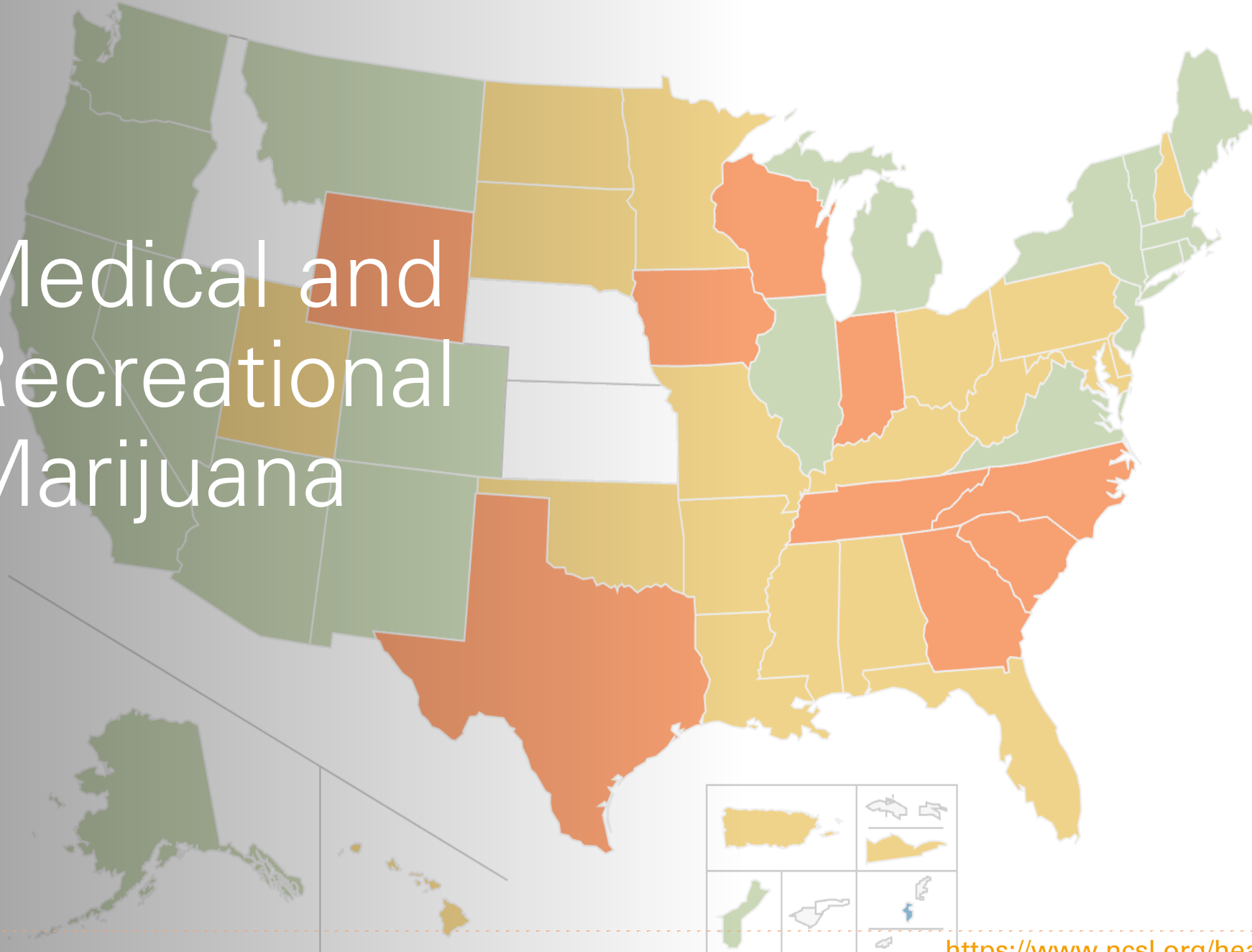
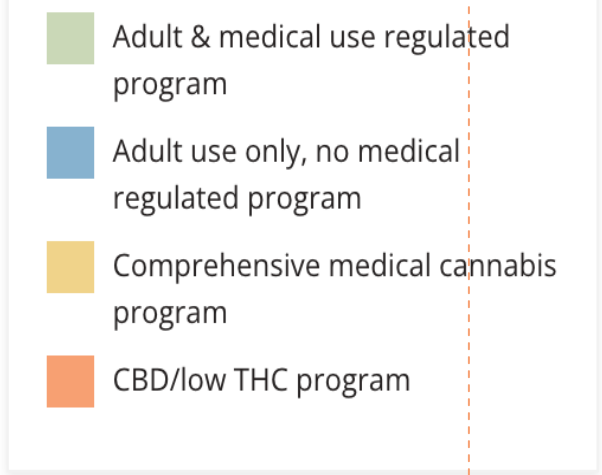
Marijuana is a Schedule One Substance

- ◆ Schedule one drugs substances or chemicals have no currently accepted medical use and high potential for abuse (Heroin LSD marijuana ecstasy..)
- ◆ THIS DOES NOT APPEAR TO BE THE CASE FOR MARIJUANA
- ◆ Epidiolex- Cannabidiol for use in treating certain rare severe seizure disorders Dravet/Lennox Gastaut
- ◆ Synthetic cannabinoids- dronabinol/nabilone
- ◆

Marijuana Used to Treat

- ◆ Appetite Stimulation- in AIDS wasting syndrome
- ◆ Treatment of Chemotherapy induced nausea and vomiting
- ◆ Severe pain
- ◆ Spasticity
- ◆ Other indications where studies indicate use : Glaucoma, Epilepsy, Anti-Inflammatory

Medical and Recreational Marijuana



<https://www.ncsl.org/health/state-medical-cannabis-laws>

Risk of Harm

- ◆ Teens NSDUH Risk of harm : 19% reported no risk in monthly cannabis use and 29% reported slight risk in monthly cannabis ¹
- ◆ Qualitative opinions adult use changing/ many adults worry about teen use
- ◆ Children of Parents who use marijuana are much more likely to use marijuana
- ◆ About 1/3 of adults in recreational states use marijuana products
- ◆ Prevalence in recreational marijuana states is double that of both nonlegal and medical marijuana use states

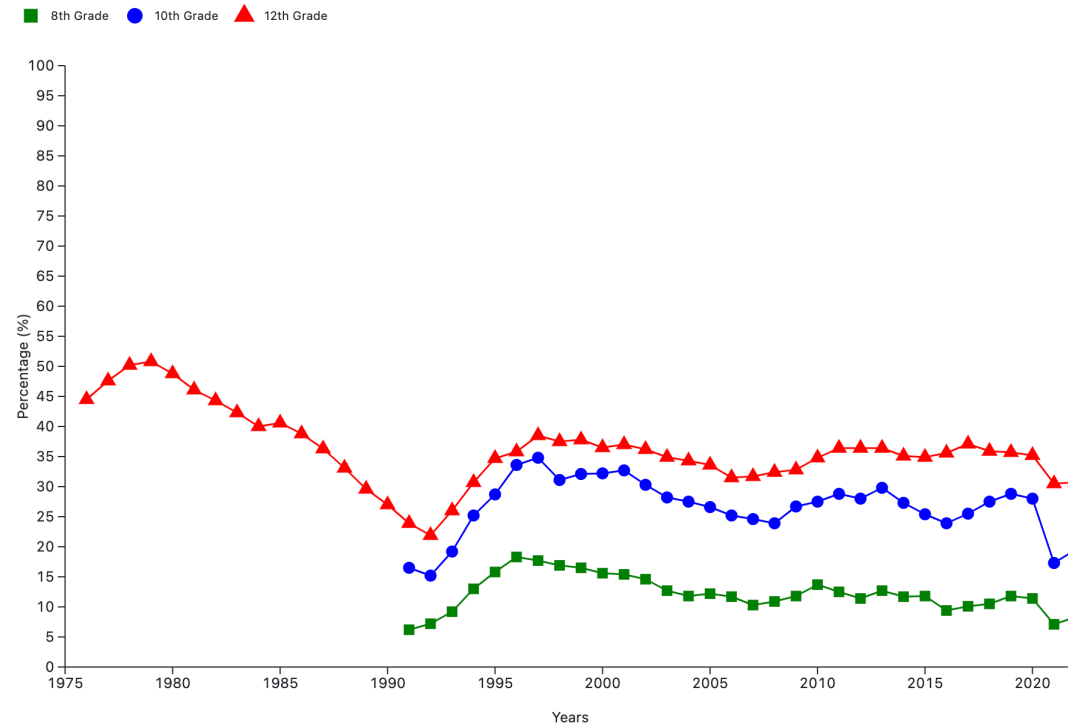
1] Mariani AC, Williams AR. Perceived risk of harm from monthly cannabis use among US adolescents: National Survey on drug Use and Health, 2017. *Prev Med Rep.* 2021 Jun 2;23:101436. doi: 10.1016/j.pmedr.2021.101436. PMID: 34168952; PMCID: PMC8209744.

2] Jones TM, Eisenberg N, Kosterman R, Lee JO, Bailey JA, Haggerty KP. Parents' Perceptions of Adolescent Exposure to Marijuana Following Legalization in Washington State. *J Soc Social Work Res.* 2020 Spring;11(1):21-38. doi: 10.1086/707642. Epub 2020 Jan 29. PMID: 33841719; PMCID: PMC8034260.

3] Black JC, Amioka E, Iwanicki JL, Dart RC, Monte AA. Evaluation of Cannabis Use Among US Adults During the COVID-19 Pandemic Within Different Legal Frameworks. *JAMA Netw Open.* 2022;5(11):e2240526. doi:10.1001/jamanetworkopen.2022.40526

Marijuana use in past 12 months

Marijuana: Trends in Last 12 Months Prevalence of Use in 8th, 10th, and 12th Grade



Suggested citation: Miech, R. A., Johnston, L. D., Patrick, M. E., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2023). Monitoring the Future National Survey Results on Drug Use, 1975–2022: Secondary School Students. Ann Arbor: Institute for Social Research, The University of Michigan. Available at <https://monitoringthefuture.org/results/publications/monographs/>

MIYHS Maine HS past 30 day Use

Cannabis Ingestions with Increases in Recreational and Medical Use In States

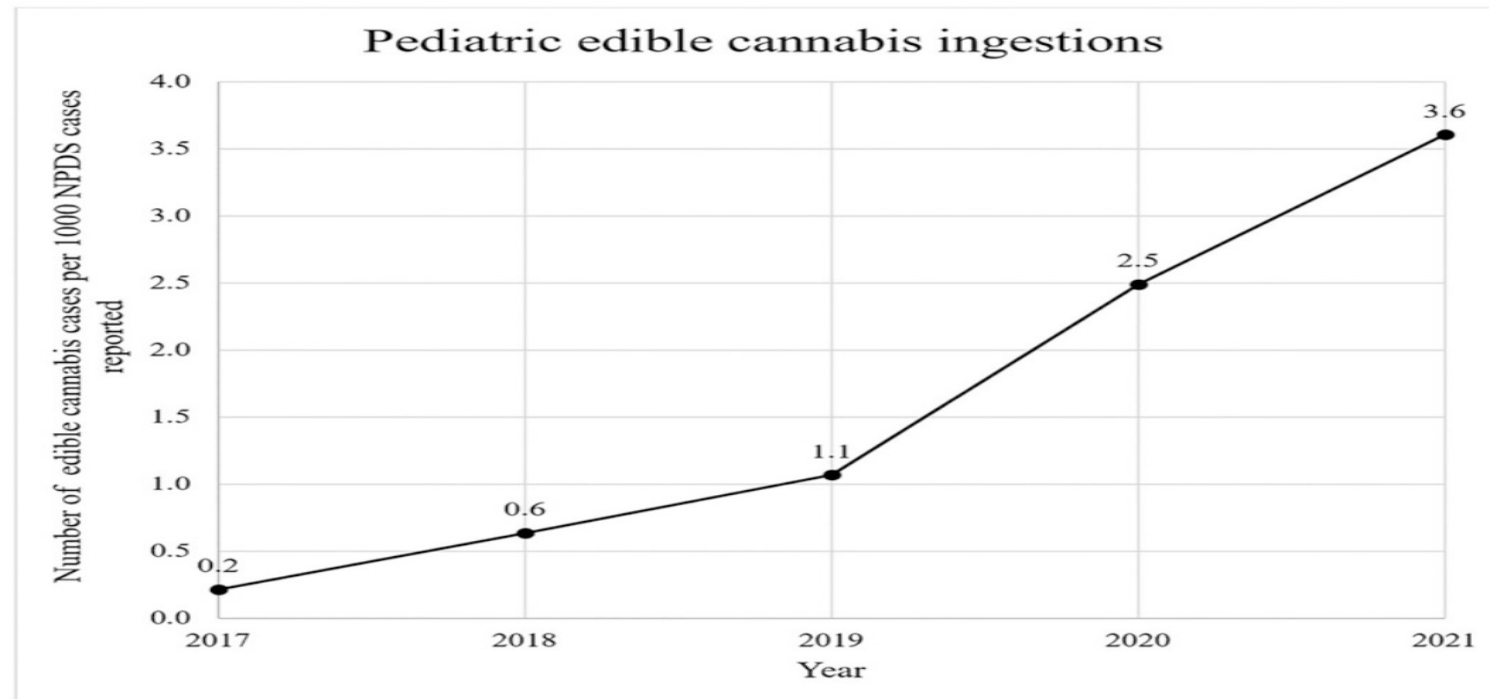
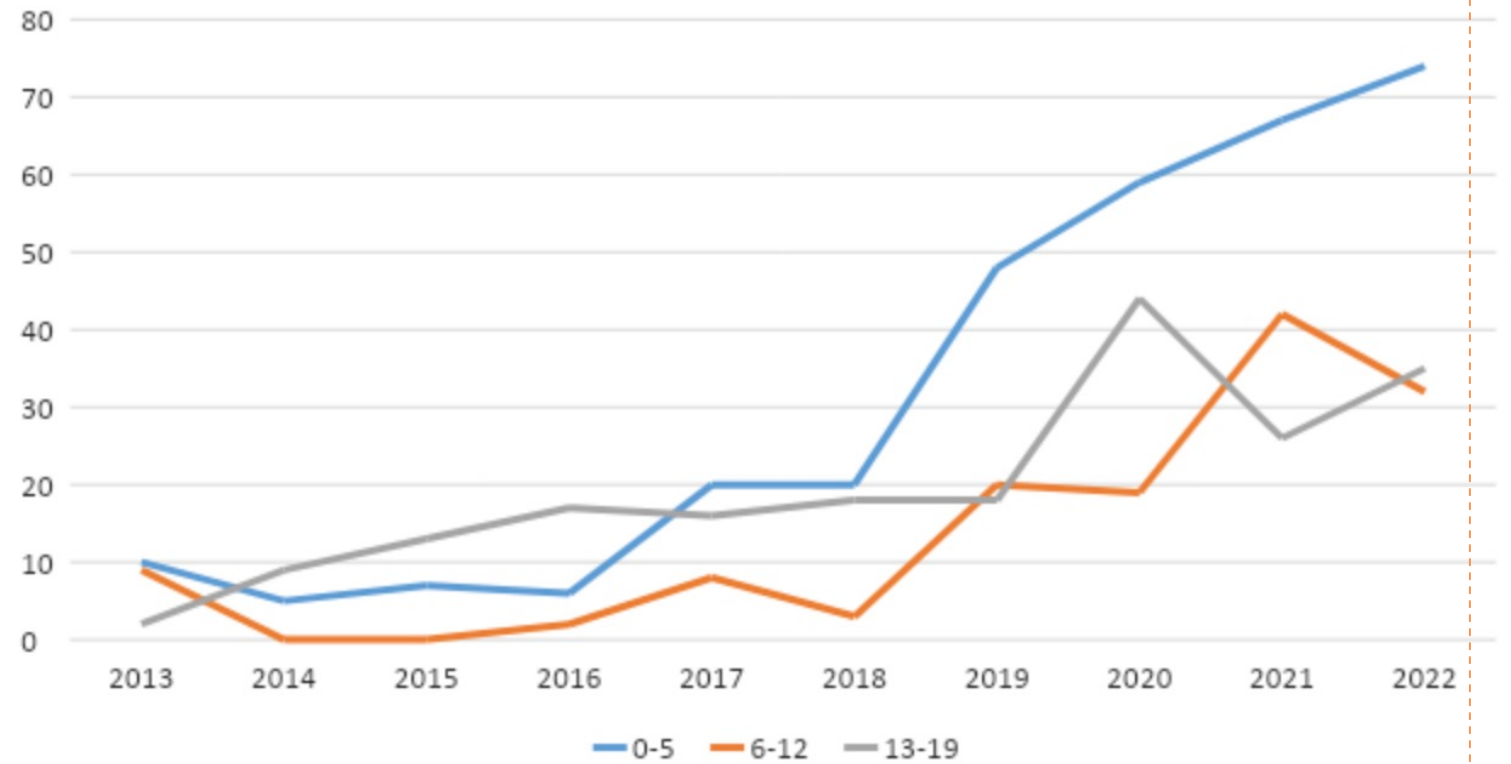


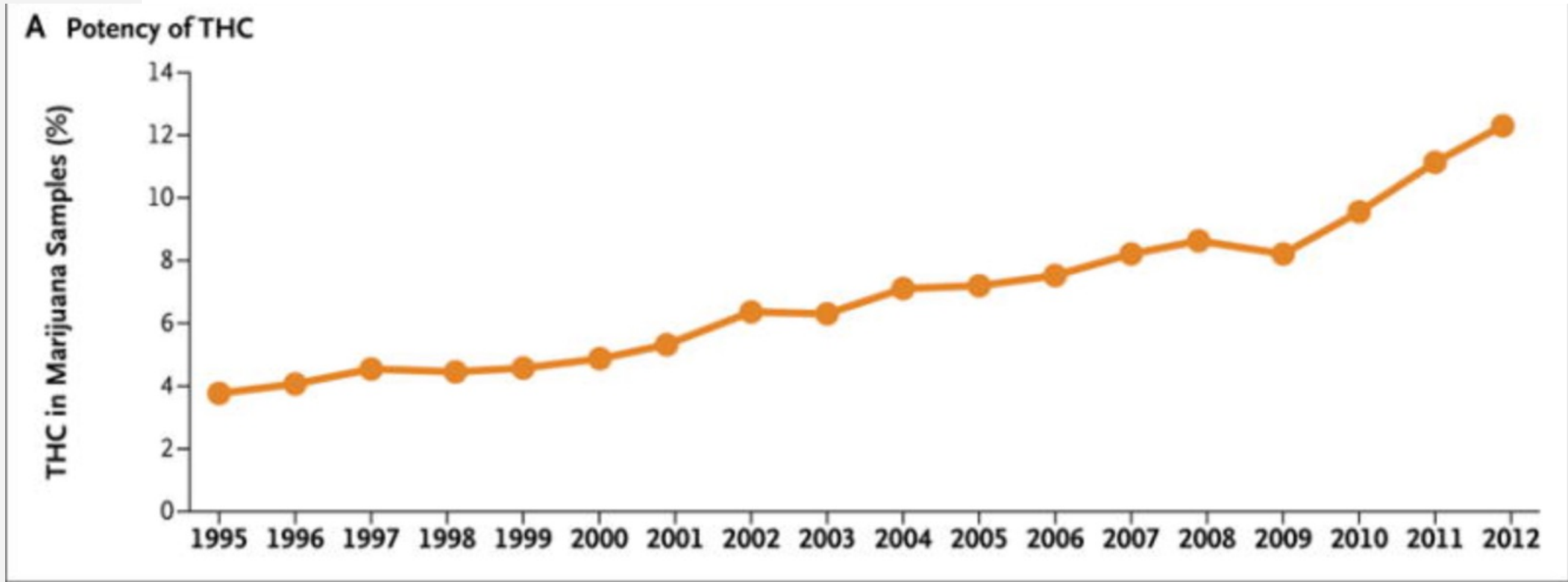
FIGURE 1
Pediatric edible cannabis product ingestions per 1000 pediatric calls to the National Poison Data System by year.

New England Poison Center

Exposures to Cannabis Among Children Less Than 20 Years Old
NEPC Cases from Maine, New Hampshire and Vermont, 2013-2022



Increasing Potency THC



Forms

- ♦ Inhalation- Smoked/Vaped/
- ♦ Oral Mucosa- Sprays
- ♦ Ingested- Edibles/Drinkables/Tablets
Capsules
- ♦ Topicals- Ointments/Rubs
- ♦ Synthetic-Spice



<https://www.travelandleisureasia.com/in/dining/bhang-holi/>

Bhang- ground fresh
leaves stems flowers

Other Forms

- ◆ Hashish
- ◆ Dried flower buds/stems/leaves
- ◆ Oil
- ◆ Tinctures





A Quick Word About Dabs

- ♦ High Concentrations THC 80-90%
- ♦ Extract oil with
- ♦ Special rigs

Look Familiar

Marijuana vaping devices



ERA PRO
More powerful and
packed with features



\$50

[SHOP NOW](#)

Pods

SUNSET SHERBET

95% THC

Available in 1G PAX Era pods.

KEY TERPENES

Caryophyllene
Limonene

FLAVORS

Sweet
Fruity

EFFECTS

Unwinding
Relaxing



Here's the scoop on Sunset Sherbet. This hybrid is a cross of the popular Girl Scout Cookies and Pink Panties cultivars and is famous for its full-body, relaxing effects. Sunset Sherbet's laid back vibes and sweet notes of fruit make it more than worthy of a second helping.

Mechanism of Action

- ♦ Δ 9THC partial CB1 and CB2 agonist
- ♦ Neuronal activity modulation
- ♦ Developmentally endocannabinoid system important for scaffold of burgeoning nervous system and synaptic connections during adolescence.

Pharmacokinetics

Rapid absorption via inhalation or oral-mucosa-5
10 minutes onset

Ingested products variable absorption / extensive
first pass metabolism in liver onset often not for a
1.5- 3hours

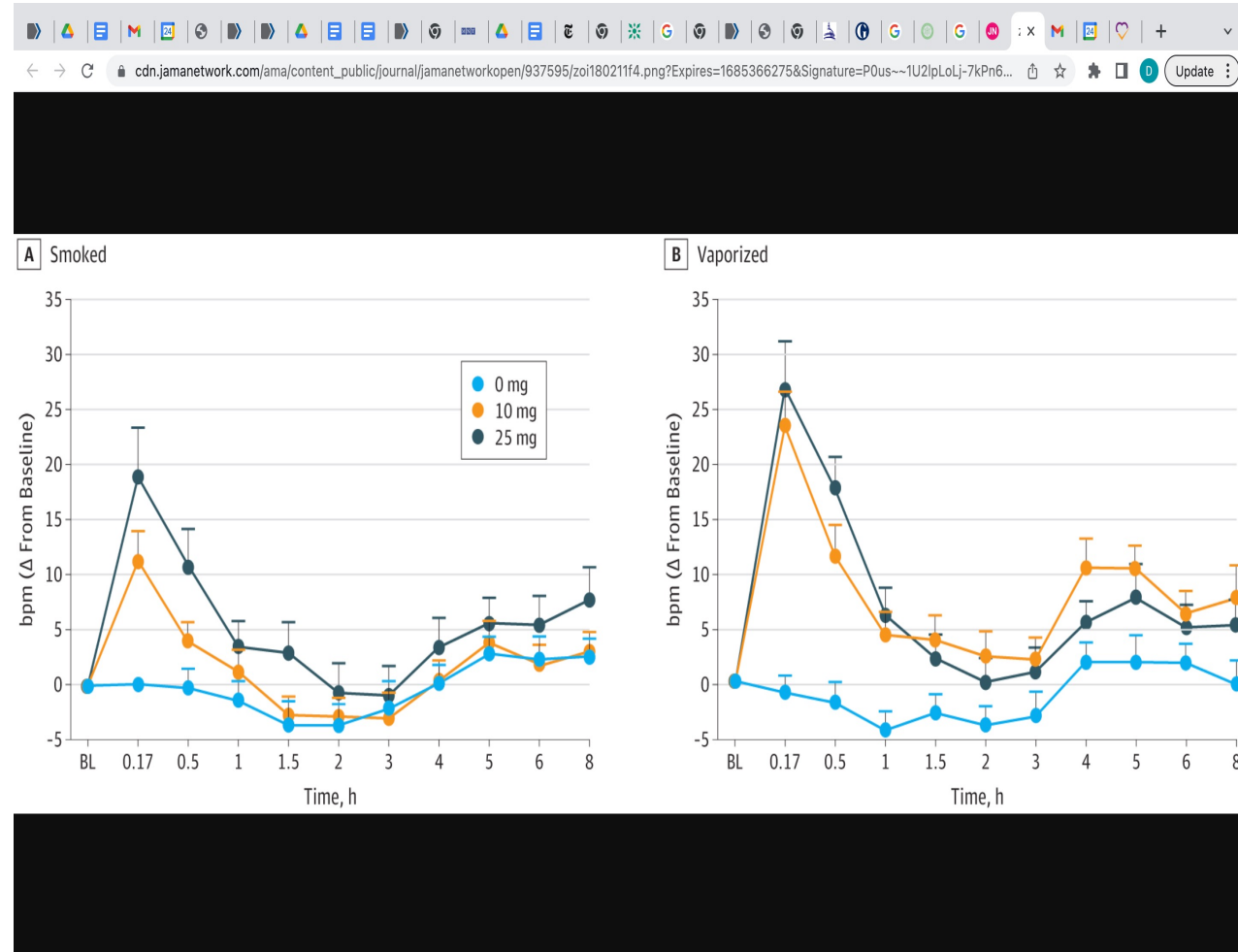
Poorly absorbed through skin

Mostly excreted through feces(65%) 20% urine

1-3 day half life in infrequent users/ 7-13 day in
heavy users

Psychomotor and cognitive impairments reported
up to 6 hours after acute use in adults

Chayasirisobhon S. Mechanisms of Action and Pharmacokinetics of Cannabis. *Perm J.* 2020
Dec;25:1-3. doi: 10.7812/TPP/19.200. PMID: 33635755; PMCID: PMC8803256.



Spindle TR, Cone EJ, Schlienz NJ, et al. Acute Effects of Smoked and Vaporized Cannabis in Healthy Adults
Who Infrequently Use Cannabis: A Crossover Trial. *JAMA Netw Open.* 2018;1(7):e184841.
doi:10.1001/jamanetworkopen.2018.4841

Acute Use

- ♦ Euphoric feeling
- ♦ Increased heartrate/BP
- ♦ Poor Coordination - MVA
- ♦ Poor Judgement-MVA/STI
- ♦ Red Eyes
- ♦ Munchies
- ♦ Dry Mouth
- ♦ Sedation
- ♦ Acute Anxiolytic

Increased Anxiety

Paranoia/Psychosis

Rare- Cardiac Dysrhythmia, EVALI

Hypertensive crisis, CV disease

Cardiomyopathy, Several Case

Reports of MI in Peds Population

Long Term Effects

- ♦ Increased Risk Cognitive Loss- Loss of IQ/Poor educational attainment ¹
- ♦ A-motivational syndrome/diminished life satisfaction and achievement ¹
- ♦ Increased risk mood disorders (Depression) ²
- ♦ Increased risk suicide- 3.5 the odds of making a suicide attempt ²
- ♦ Increased risk of psychotic disorder and exacerbation of the course of these illnesses
- ♦ Chronic Bronchitis
- ♦ Hyper-emesis/Weight loss
- ♦ Cardiovascular disease

Risk of Addiction

- ♦ 1 in 6 teens who use will develop addiction
- ♦ Daily adolescent users have much higher risk 25 to 50%
- ♦ Onset of use in adolescence versus adulthood increases risk by 2 to 4 times of dependence in 2 years after initiation.
- ♦ Increases risk of other substance use.

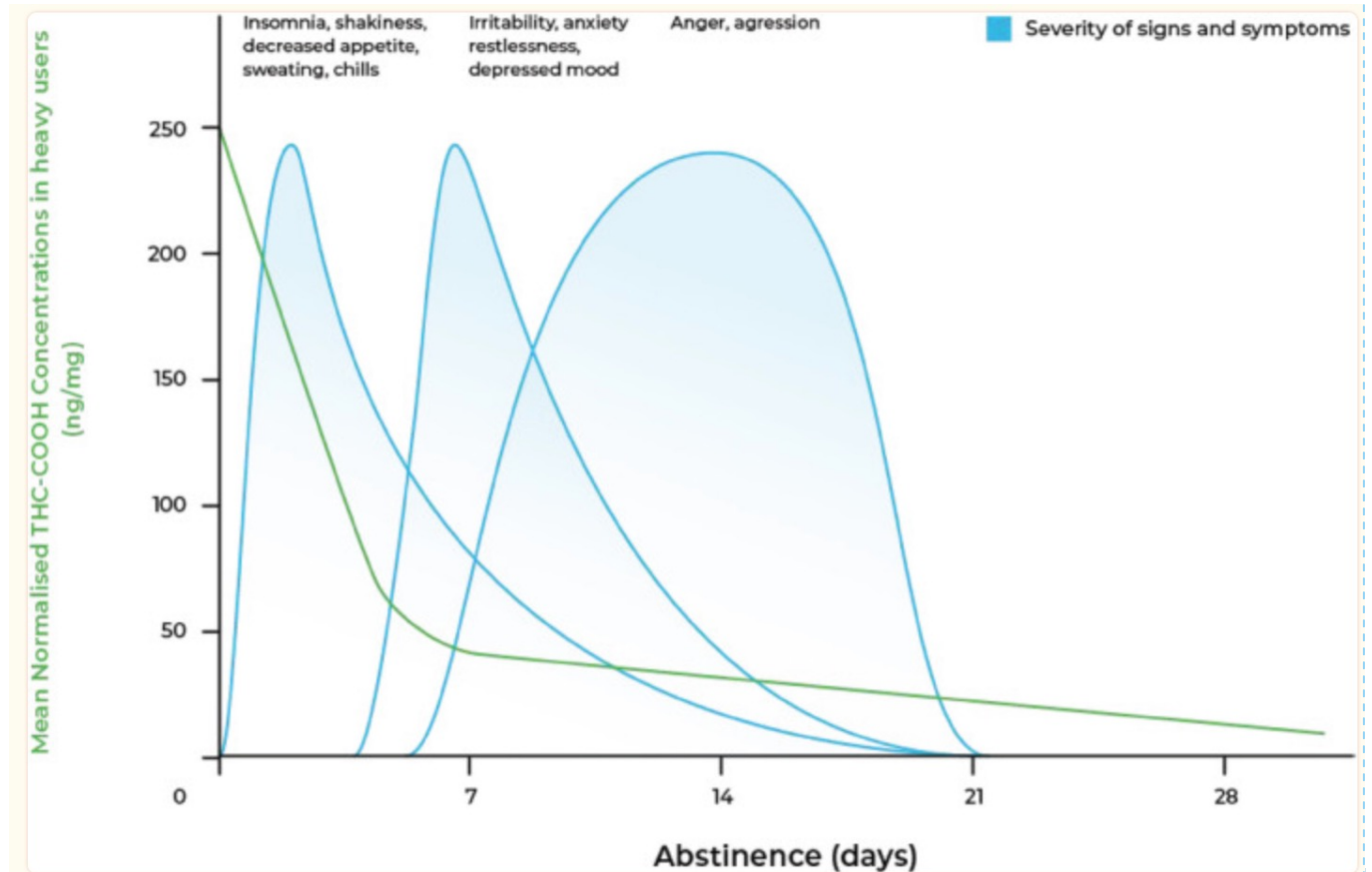
Cannabis Use Disorder

- Cannabis is often taken in larger amounts or over a longer period than intended
- There is a persistent desire or unsuccessful efforts to cut down or control cannabis use
- A great deal of time is spent in activities necessary to obtain cannabis, use cannabis or recover from its effects
- Craving or a strong desire to use cannabis
- Recurrent cannabis use results in failure to fulfill role obligations at work, school or home
- Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis
- Important social, occupational or recreational activities are given up or reduced because of cannabis use
- Recurrent cannabis use in situations in which it is physically hazardous
- Cannabis use continues despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis.
- Tolerance, as defined by either: (1) a need for markedly increased cannabis to achieve intoxication or desired effect or (2) a markedly diminished effect with continued use of the same amount of the substance.
- Withdrawal, as manifested by either (1) the characteristic withdrawal syndrome for cannabis or (2) cannabis is taken to relieve or avoid withdrawal symptoms.

•

Cannabis Withdrawal Syndrome

- ♦ Onset 24-48 post cessation/window of improvement after 4-7 days
- ♦ Symptoms: poor appetite/shakiness/ poor sleep/strange dreams/sweating/chills/rarely fever Anxious/irritable/depressed//angry/ aggressive
- ♦ More severe with CUD/psychiatric illness/polysubstance use



Treatments

- ♦ Psychotherapy is mainstay:
 - ♦ CBT/ ACRA/MET
 - ♦ Contingency Management
 - ♦ Family Therapies
- ♦ Treat comorbid psychiatric illness /substance use
- ♦ NAC studied in teens 1200mg bid
- ♦ Adults trials using pharmaceutical cannabinoids dronabinol/
- ♦ Hyperemesis- abstain/fluids/topical agents
- ♦ TREATME- MORE TO COME

Prevention

- ♦ Parental Attitudes/Use
- ♦ Parental Monitoring
- ♦ Peer Attitudes
- ♦ School Engagement
- ♦ Engagement in Extracurricular Activities

Cannabis Use in Adolescence

January 22, 2025

Joint Standing Committee on Health and Human Services

Amy M. Mayhew, MD, MPH

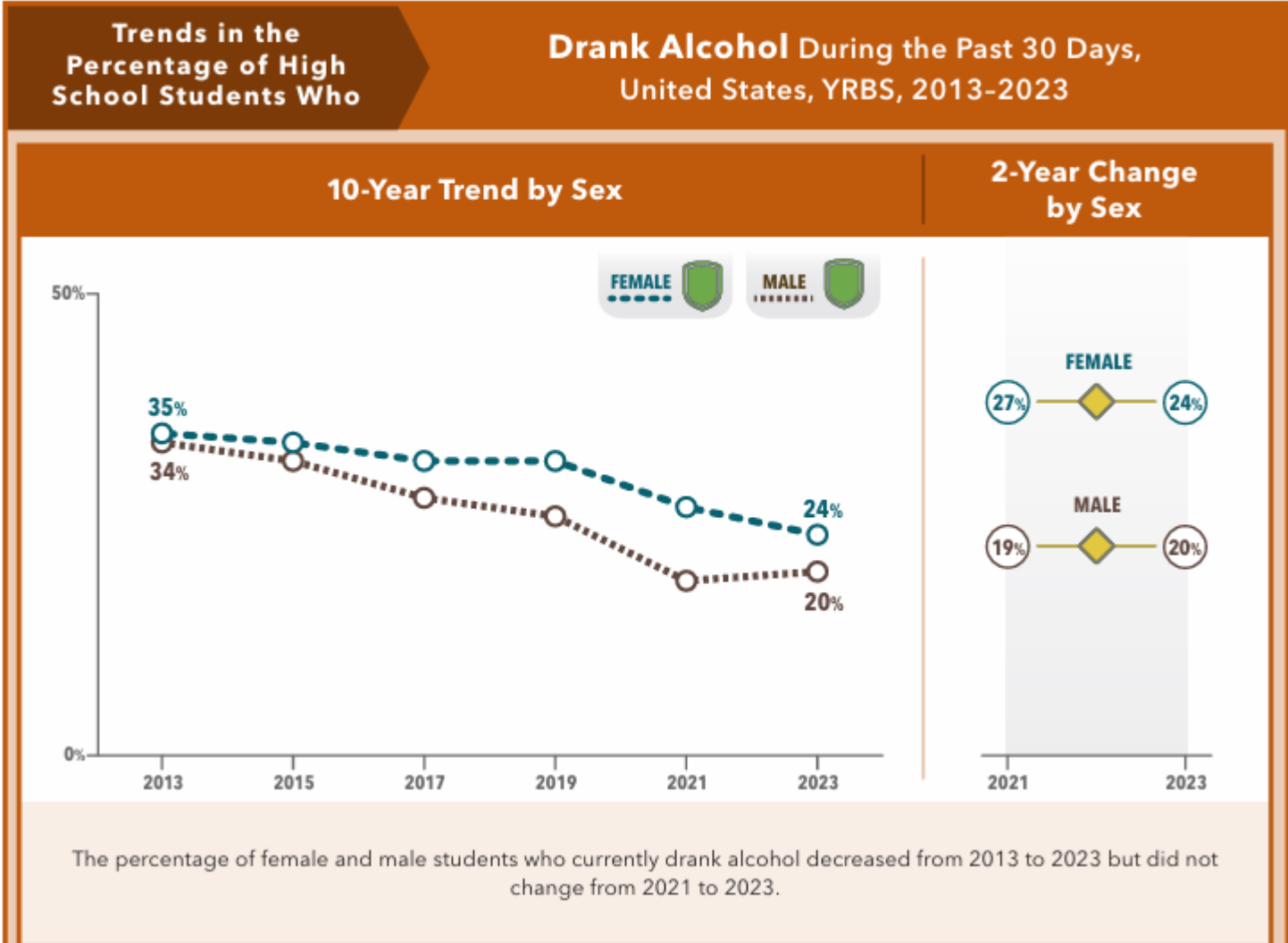
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Maine and Cannabis

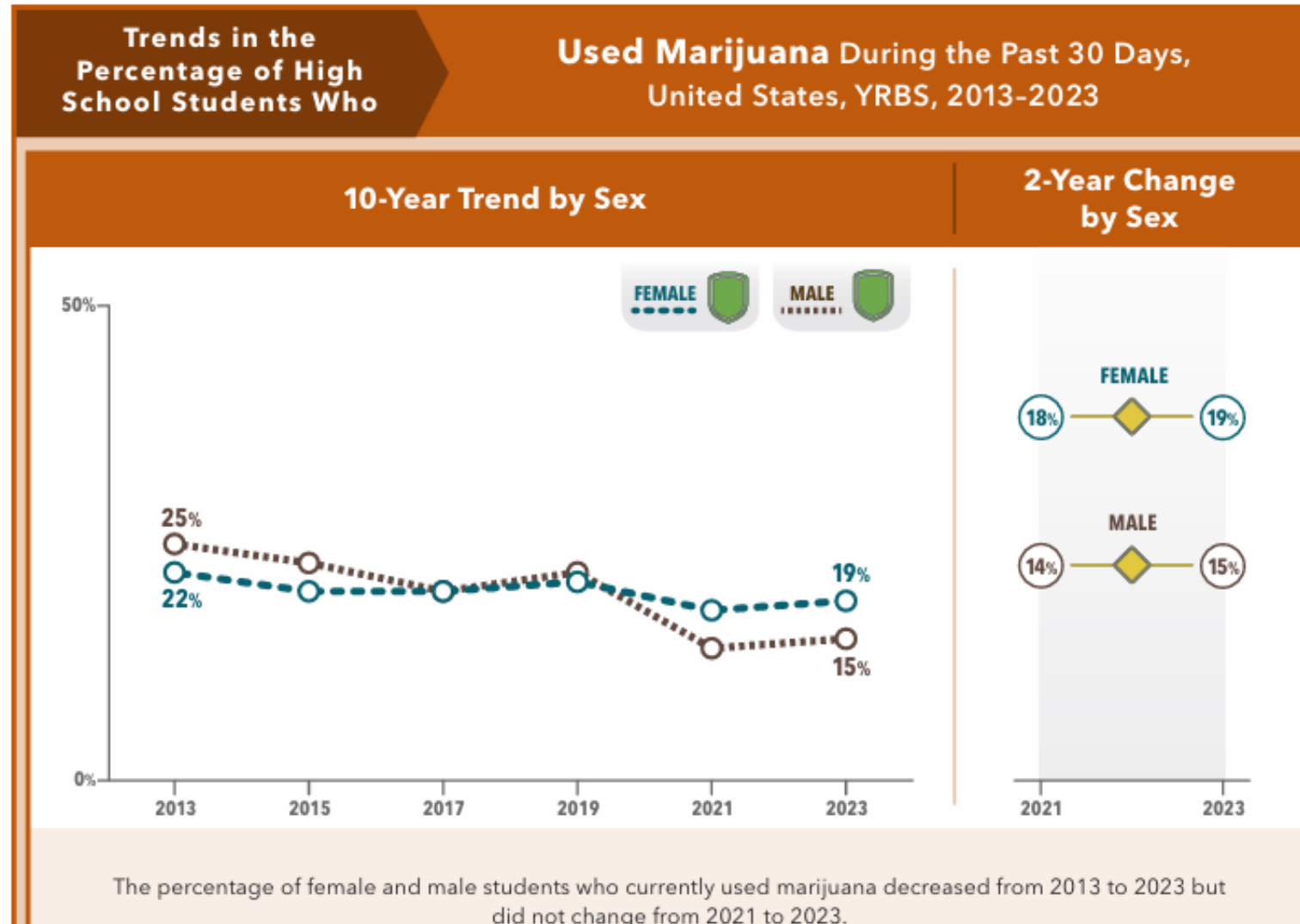
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- Sales of \$217 million in 2023, a 36% increase over the previous year's amount of \$159 million (Press Herald)
- The state gained \$21 million in tax revenue in 2023
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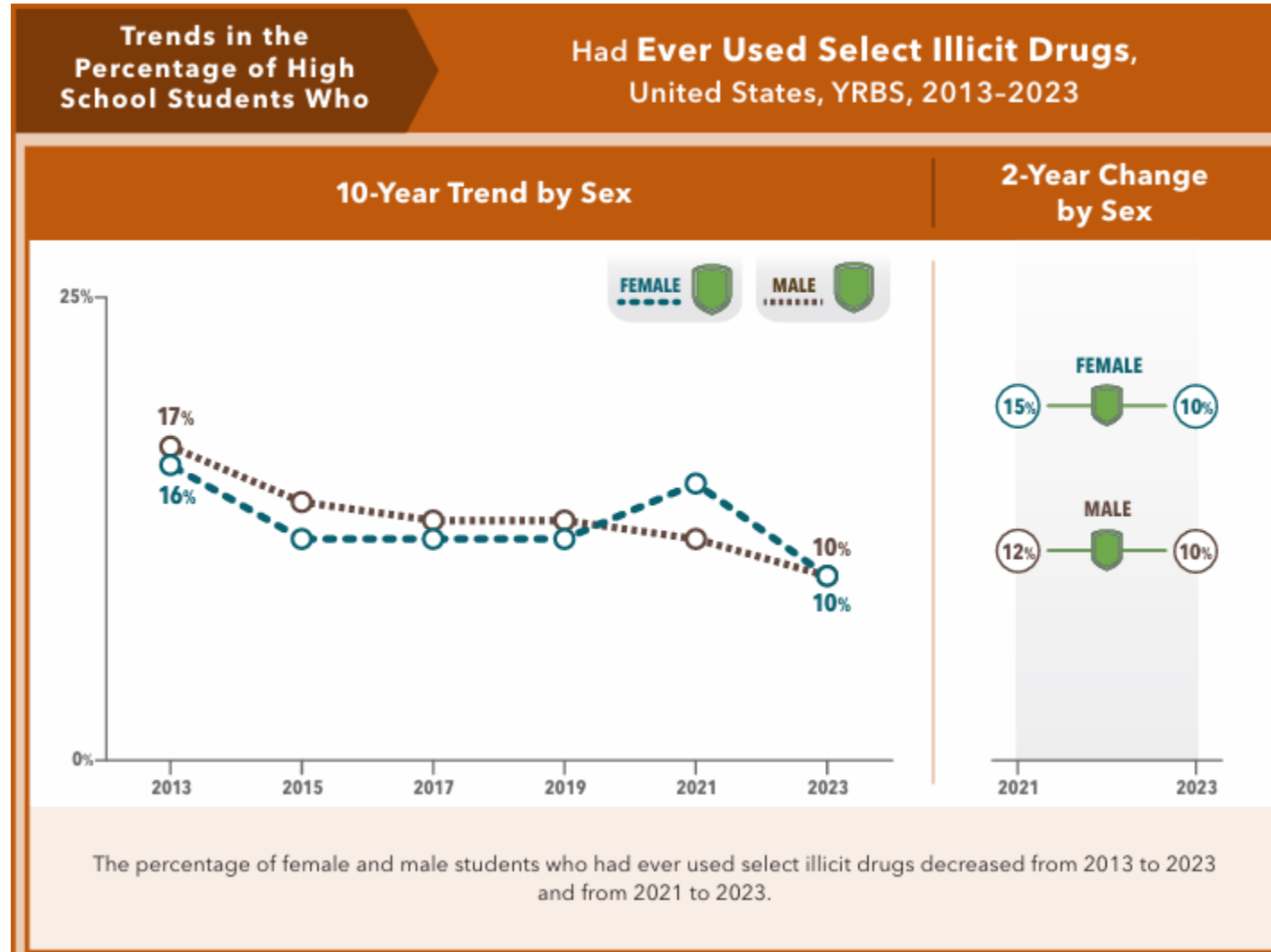
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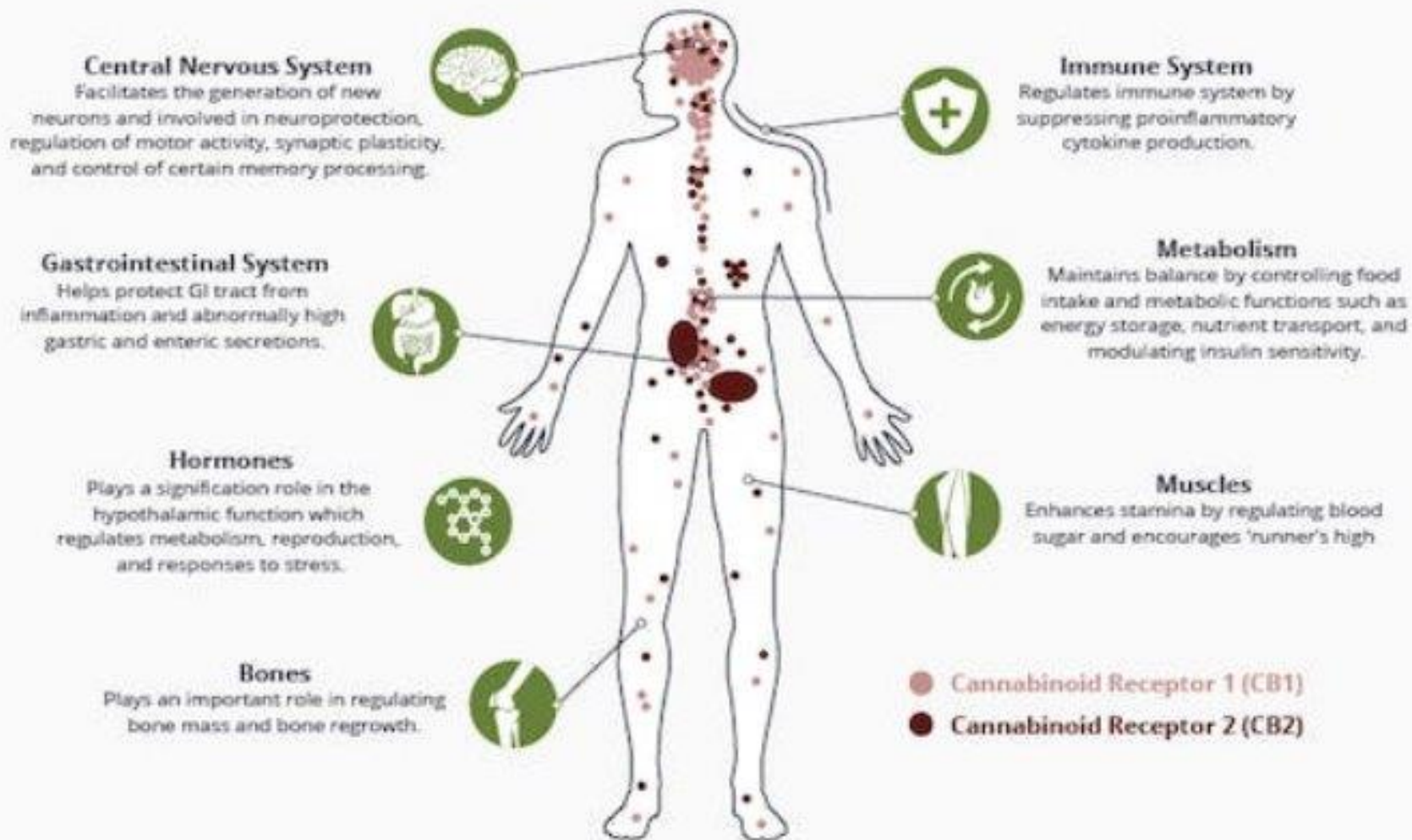
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THE BODY'S ENDOCANNABINOID SYSTEM



Medical Uses of Cannabis- some data

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- Dravet syndrome (children- 2nd line)
- Chronic pain (adults)
- Anti-emetics (adults)
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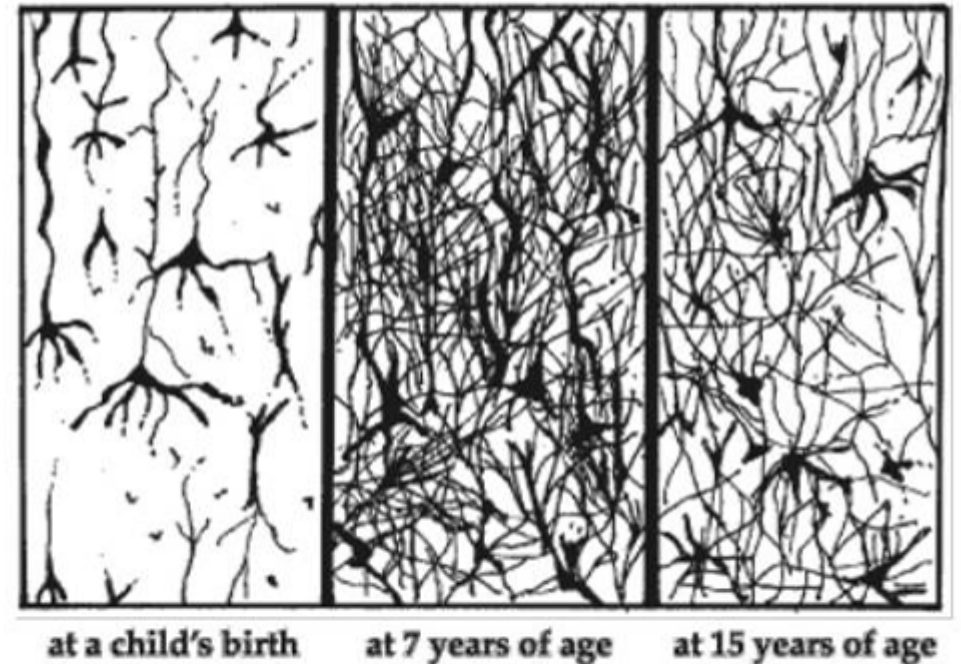


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 - 2% THC provided no benefit
 - 4% THC provided significant pain decrease
 - 8% THC caused increased pain or hyperalgesia

Neurocognitive Adverse Effects

- Because of role in the prefrontal cortex and hippocampus, maturation of circuits regulating attention, executive functioning, and memory can be affected by cannabis use during adolescence (Rubino, 2009)
- Persistent neurocognitive changes and lower functioning even after abstaining from cannabis use, even after a year (Meier, 2012)
- Cannabis use was adverse effects on IQ and executive functioning and declines in neural connectivity (Camchong, 2017)
- Those who start using before 17 yo have reduced odds of high school graduation, more likely to have cannabis use disorder, more likely to use other illicit substances and tobacco, and more suicide attempts (Silins, 2014)

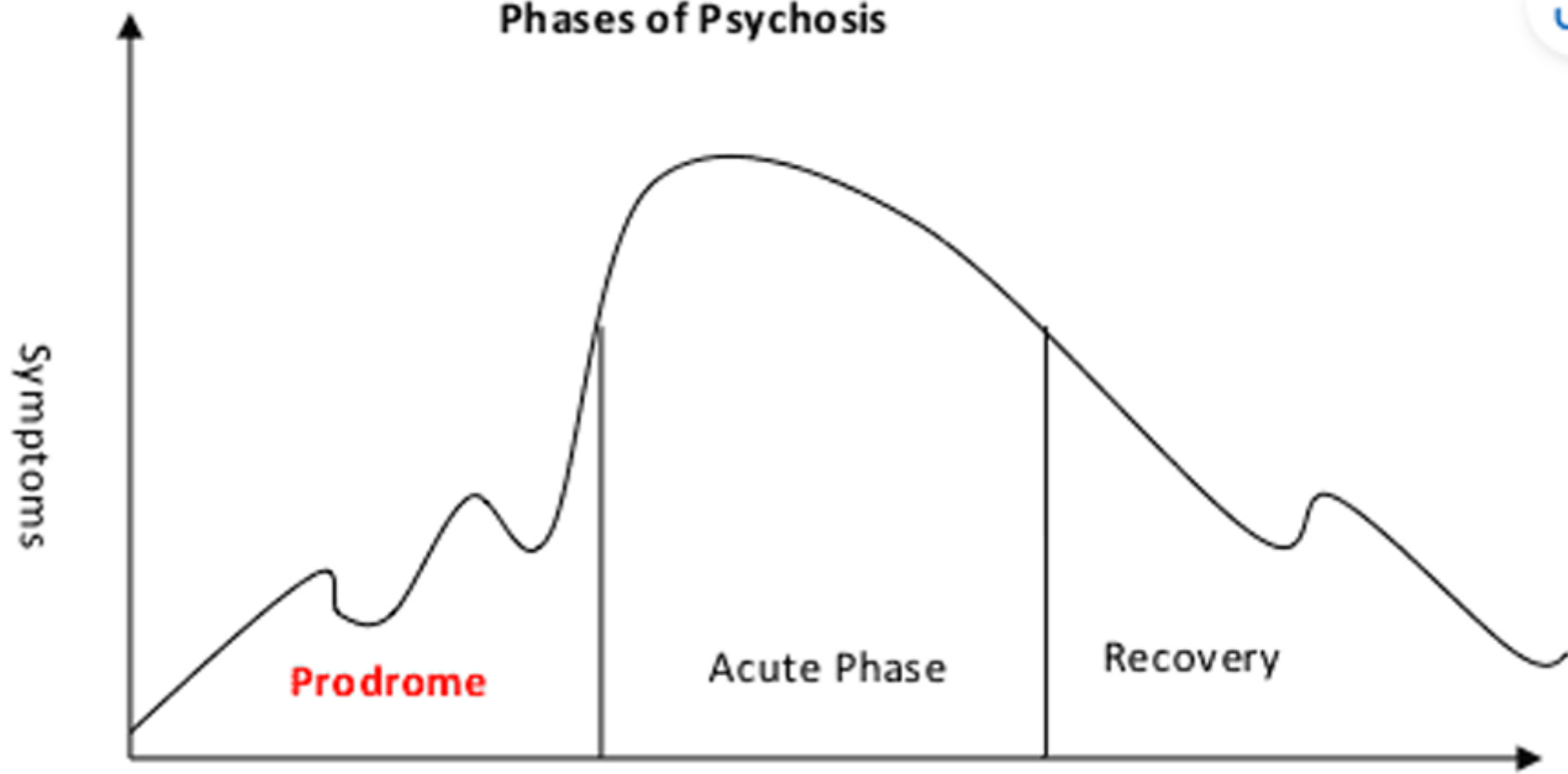


Psychosis

- A range of conditions that affect the mind in which there has been some loss of contact with reality
- Hallucinations and delusions can be very real and distressing
- Also changes to thought processes, mood, sleep, and behavior
- Majority of cases first occur between 13-30
- Use of THC in particular may trigger psychosis in certain individuals, especially with earlier use and more potent strains
- Accelerated loss of grey matter volume in those with schizophrenia



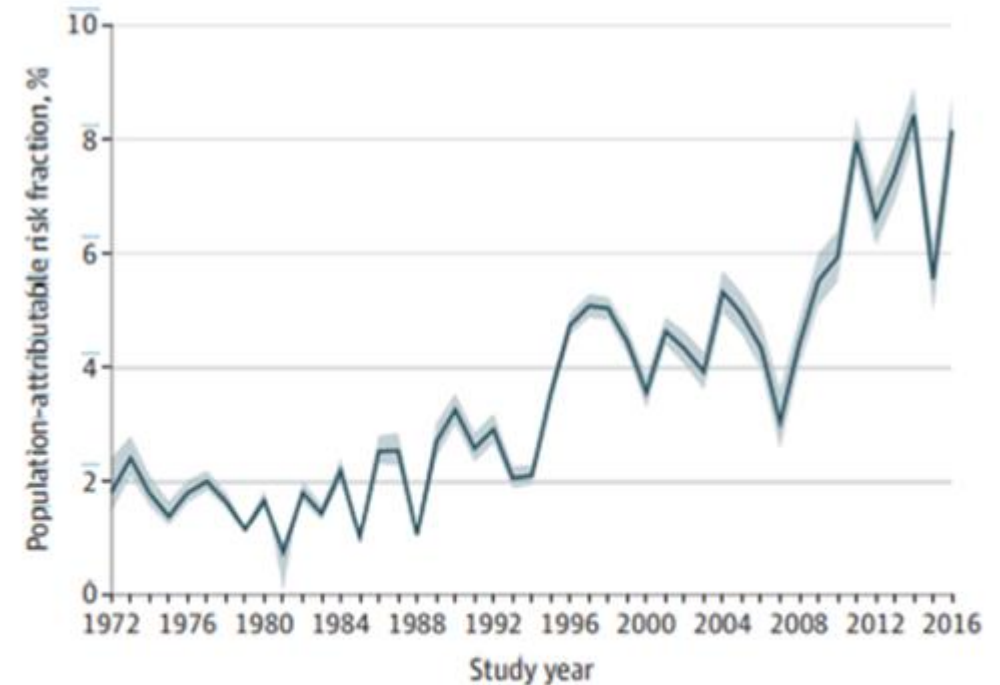
Phases of Psychosis



Increased potency in past 2 decades has resulted in a 4-fold increase in cannabis use and Schizophrenia

- Very large longitudinal population-based study of **7,186, 834 individuals** in Denmark
- The population-attributable risk fraction for cannabis use disorder in schizophrenia increased from approximately 2% in the period to 1995 to approximately 6% to 8% since 2010.
- This study challenges the often-cited argument against causality that an expected increase in cases of schizophrenia attributable to cannabis use has not been observed.
- Hjorthøj C et al. JAMA Psychiatry July 21, **2021**

Figure 2. Development of the Population-Attributable Risk Fraction (PARF) of Cannabis Use Disorder in Schizophrenia in Denmark



Shaded areas indicate 95% CIs.

Credit to Dr. Elizabeth Stuyt, MD

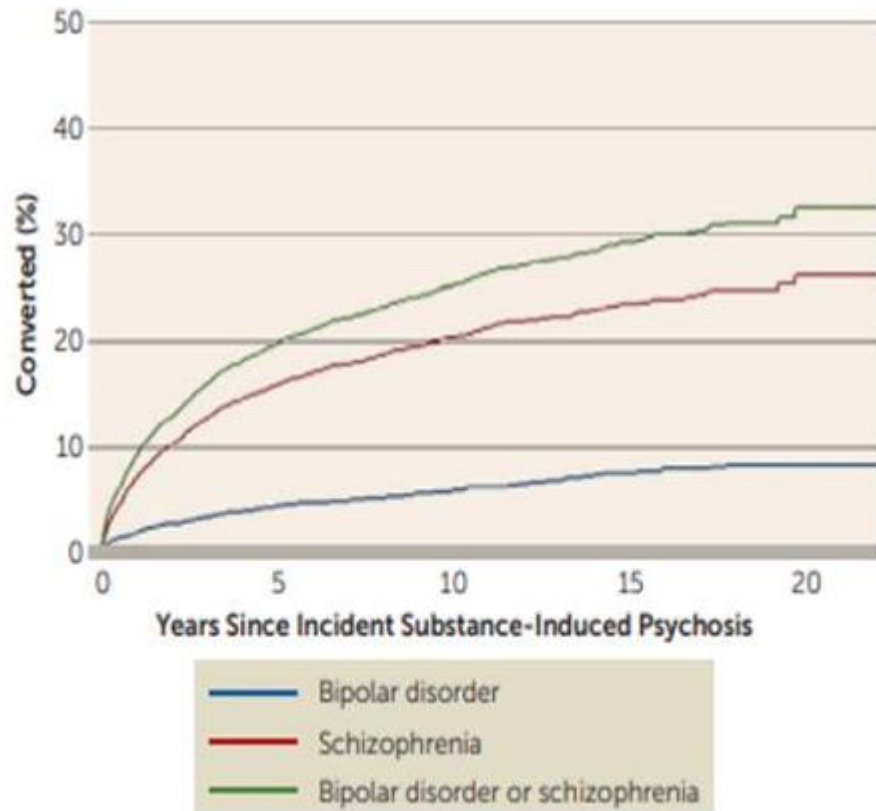
Marijuana and Psychosis

- Ten European and one Brazilian site, 901 pts c 1st episode of psychosis, 1237 healthy controls (Lancet)
- Daily marijuana use and high-potency marijuana (THC>10%) are strongest predictors of a psychotic episode
- Individuals with high potency MJ 1.6 times more likely to develop psychosis than non-users
- High potency and daily use 5 times more likely to develop psychosis than non-users
- 12.2% of episodes of 1st episode psychosis could be prevented, rising to 30.3 % in London and 50.3% in Amsterdam



Rates of conversion to schizophrenia or bipolar disorder after substance-induced psychosis

FIGURE 1. Rates of Conversion to Schizophrenia and Bipolar Disorder Following Incident Substance-Induced Psychosis in a Registry Study (N=6,788)



- 32.2% of patients with substance-induced psychosis later converted to either bipolar disorder or schizophrenia
- Highest conversion rate (47.7%) was for cannabis-induced psychosis
- Young age associated with a greater risk of conversion, risk highest in the range of 16-25 years
- Self-harm after an episode of substance-induced psychosis also linked with a greater risk of conversion to schizophrenia or bipolar disorder

Epub 2021 Feb 22.

Cannabis use in adolescence and risk of psychosis: Are there factors that moderate this relationship? A systematic review and meta-analysis

Sarah Kanana Kiburi ^{1 2}, Keneilwe Molebatsi ^{3 4}, Vuyokazi Ntlantsana ⁴, Michael T Lynskey ⁵

63 studies in narrative review, 18 studies in meta-analysis

Important factors for psychosis risk:

- age of onset of cannabis use
- frequency of cannabis use
- exposure to childhood trauma
- concurrent use of other substances
- genetic factors

Biggest risk factors with cannabis for psychosis or schizophrenia

- Using cannabis before the age of 16; best to use after brain maturation
- Dose-dependent relationship of risk
- Any cannabis use associated with a 40% increased risk of psychosis
- Higher frequency and potency increases risk and severity of psychotic symptoms
- Those with a family history of psychosis are 2.5-10 times more likely to develop a psychotic illness

Prevalence of cannabis use in early psychosis

- 33-54% of individuals with clinical high risk symptoms use cannabis
- 22-50% of individuals with first episode of psychosis use cannabis
- Cannabis use increases risk for having psychosis symptoms, both attenuated and acute
- Youth at CHR-p may use cannabis to alleviate depression, anxiety, or negative symptoms
- After the onset of positive symptoms, may be used as a way of coping with those symptoms
- Earlier age of use and higher usage of high-THC is associated with poorer outcomes

Cannabis and Bipolar Disorder



- Relatively well-known association between marijuana and psychotic spectrum illnesses
- Several articles have shown that marijuana may worsen manic symptoms in those with bipolar disorder
- Cannabis may also be a causal risk factor, with an increased incidence of up to three-fold
- *Cannabis use and mania symptoms: a systematic review and meta-analysis, Gibbs, M, et al; J Affective Disord Jan 2015*

Cannabis and Depression

- Meta-analysis of 11 studies and 23.317 individuals
- OR of developing depression in MJ users vs non-users is 1.37 (95% CI 1.16-1.62)
- OR of anxiety not statistically significant 1.18 (95% CI 0.84-1.67)
- OR of suicidal ideation of 1.50 (95% CI 1.11-2.03)
- OR for suicide attempt of 3.46 (95% CI 1.53-7.84)



(Gobbi, 2019)

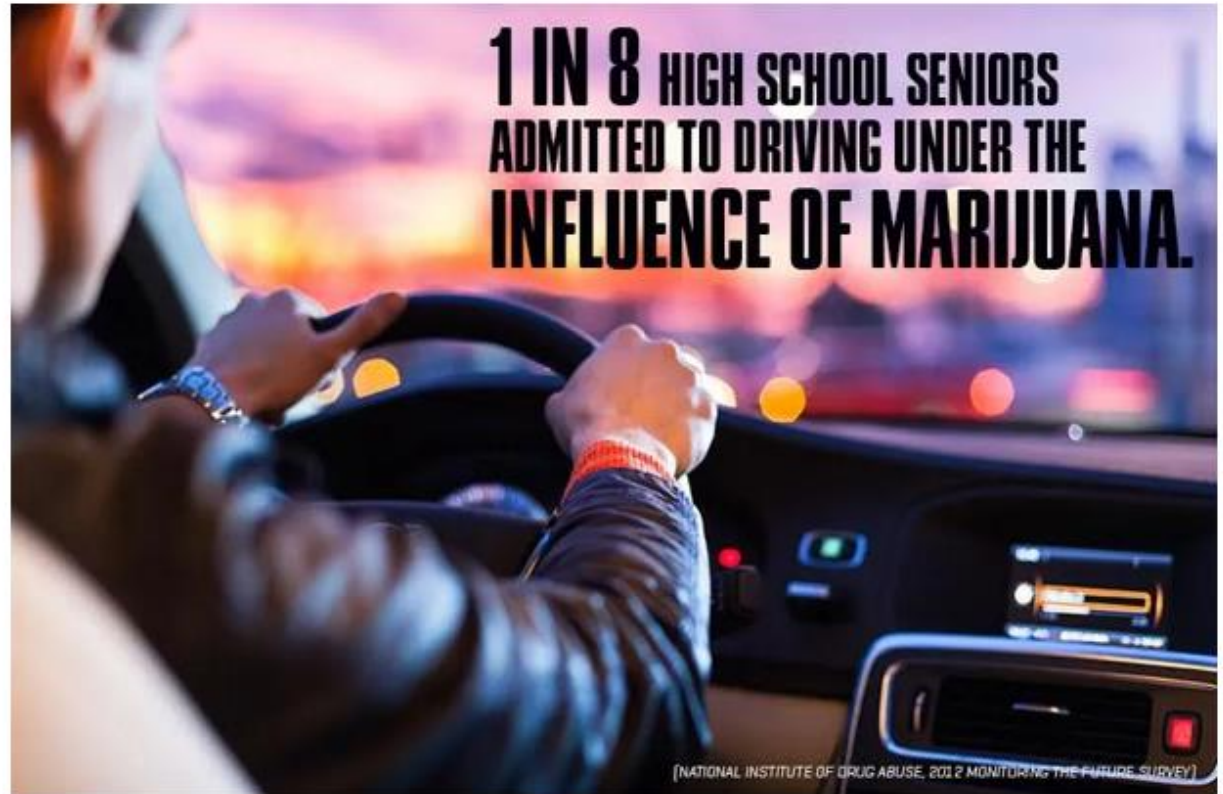
Cannabis and Anxiety



- Anxiety is often cited by adolescence as a reason they use cannabis
- Anxiety is one of the most common disorders
- Acute use of MJ can either mitigate or cause anxiety; CBD often cited as being more helpful
- Anxiety returns when person is no longer using, having not learned any skills
- 27 adolescent studies: 67% found a positive relationship between anxiety and MJ use, but relationship was unclear (causal or incidental)

Cannabis Use and Sequellae

- Most adolescents do not perceive MJ use as harmful or addictive
- As opposed to ETOH, drivers feel MJ is safer to use while driving, yet do not understand the effects (Keyes, 2016)
- Animal studies show MJ does prime the brain to the effects of other substances
- Those who use MJ have a 2.78 increased risk of opiate use disorder, as well as increased risk of stimulants, cocaine, and injection drugs (Olfson, 2018)
- 8-12% of MJ users will develop moderate to severe cannabis disorders
- Withdrawal is not fatal, but within a week of stopping can be linked to irritability or aggression, anxiety, decreased appetite, depressed mood, abdominal pain, tremor, fever chills and headaches



Vignettes

- 19 yo patient initially presented with 'cannabis-induced' psychosis, continued after abstinence to believe he was the anti-Christ, thought he was broadcasting his thoughts, paranoia, seeing colors and vibrations, multiple hospitalizations. Initially responded to medications, but stopped medication and had reoccurrence of symptoms
- 23 yo medical student, tried cannabis twice and developed a psychotic illness; was able to manage symptoms with risperidone, but has continued to notice a change in the ability to process information
- 15 yo who was smoking and vaping regularly, became convinced he was going to be killed by a neighbor, asked an acquaintance to bring him a gun before changing his mind.
- 16 yo using cannabis daily who became paranoid that there were figures following them at school, hanging at the end of the bed, starting talking to them in school
- 15 yo who believed mother was trying to poison them and stopped eating
- 14 yo who was convinced there were people trying to break in to their house, ran off thinking 'they' were chasing them
- 15 yo who thought TikTok was sending algorithms based on their feelings to control them
- 17 yo who had a manic episode after smoking cannabis at a party; up for 6 days, stopped going to class or eating regularly, was hospitalized



Fact Sheet: Cannabis and Psychosis

The growing legalization of cannabis across the United States, in addition to the frequent use of cannabis by individuals with psychosis, has led to many questions and concerns about the impacts. The following is a summary of the latest research findings regarding the link between cannabis and psychosis.

Risk of Psychosis from Cannabis Use:

- Studies have shown that THC in cannabis can cause short-term psychosis until the drug is metabolized in the body
- If exposed to cannabis in adolescence, research shows individuals are 2-4x more likely to develop a schizophrenia spectrum disorder, than if you were not exposed
 - o Not everyone who uses cannabis develops psychosis and not everyone with a psychotic disorder was exposed to cannabis.
- Consider avoiding or delaying use of cannabis until after the age of typical expression/onset of the illness (at least 25) (*age of expression can range from ~16-35 years old*)
- Those initially diagnosed with a cannabis-induced psychosis, have greater rates of developing schizophrenia over the long-term
- Frequency and amount, time of exposure, duration of exposure, and potency of cannabis all impact amount of risk for psychosis associated with cannabis use (greater frequency and duration, earlier first use, and higher potency THC = greater risk of psychosis)
- Daily and higher potency cannabis leads to increased risk of psychosis
- Today's cannabis tends to be more potent (higher levels of THC) than several decades ago
- 15% of new cases of psychosis are attributable to cannabis use
- The risk for developing schizophrenia spectrum disorders is greatest with cannabis, although other substances such as amphetamines, hallucinogens, opioids, and sedatives also increase risk.

Cannabis use after the onset of psychosis is associated with:

- More non-adherence to treatment
 - More hospitalizations
 - More ER visits
 - More relapses
 - More legal problems
 - More homelessness
- In regard to the self-medication hypothesis, cannabis use may result in a very temporary reduction in distress associated with psychotic symptoms, however, cannabis use makes symptoms of psychosis worse in the moment and over the long-term

CBD and Psychosis:

- CBD market is largely unregulated so ratios of CBD to THC, as well as general contents may vary greatly from what is advertised
- In a study examining the antipsychotic properties of CBD at Yale, CBD did not improve symptoms of psychosis



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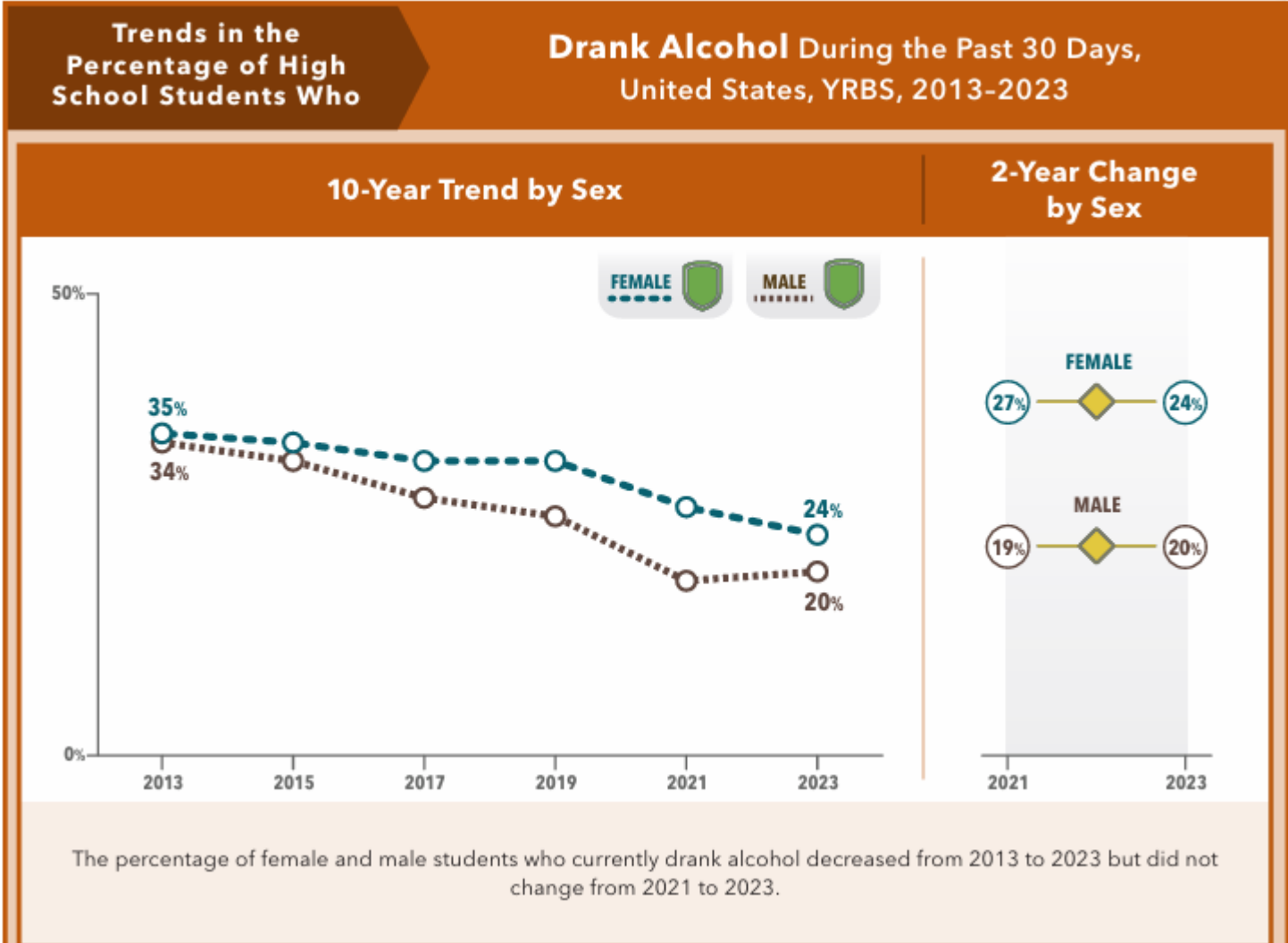
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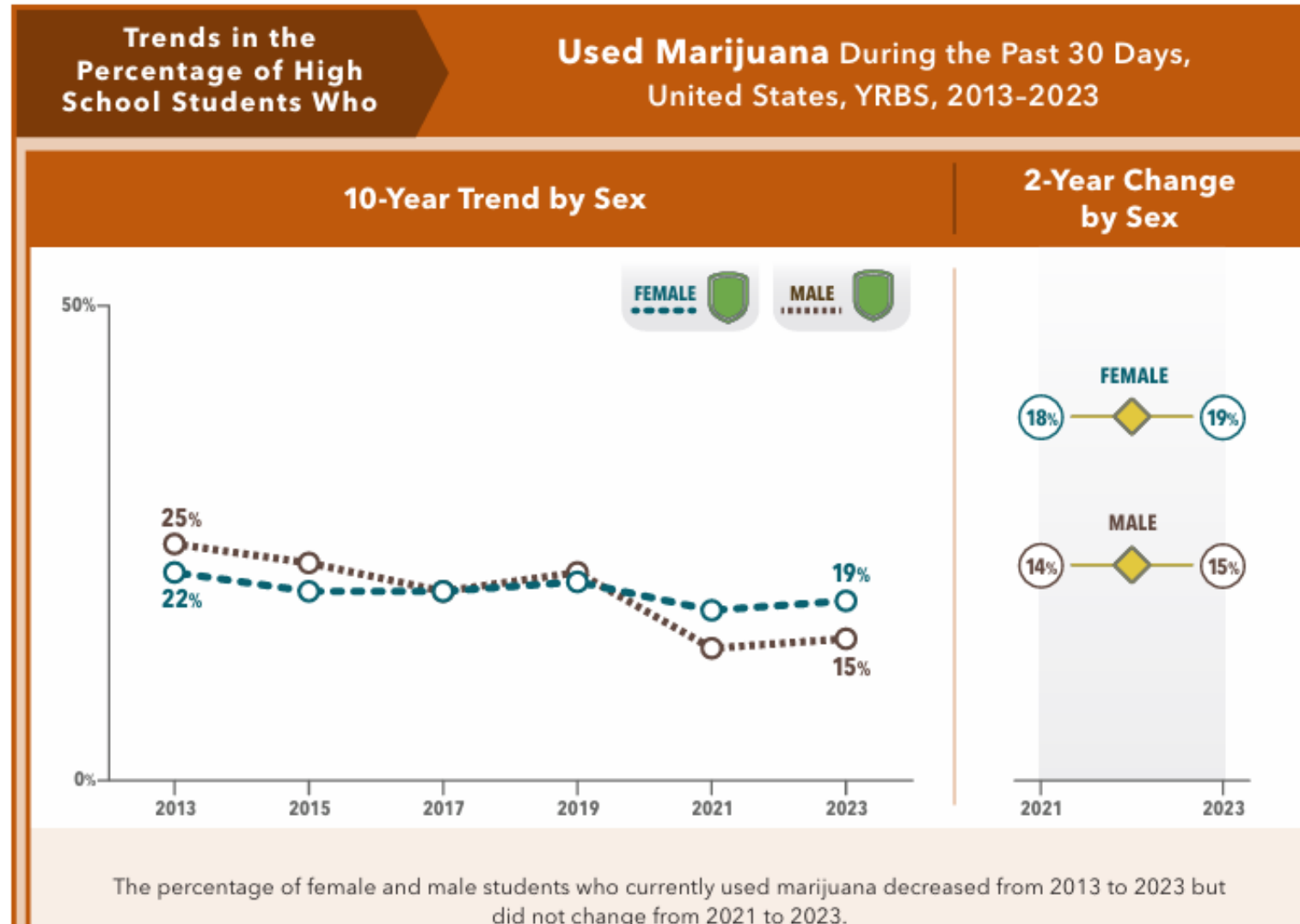
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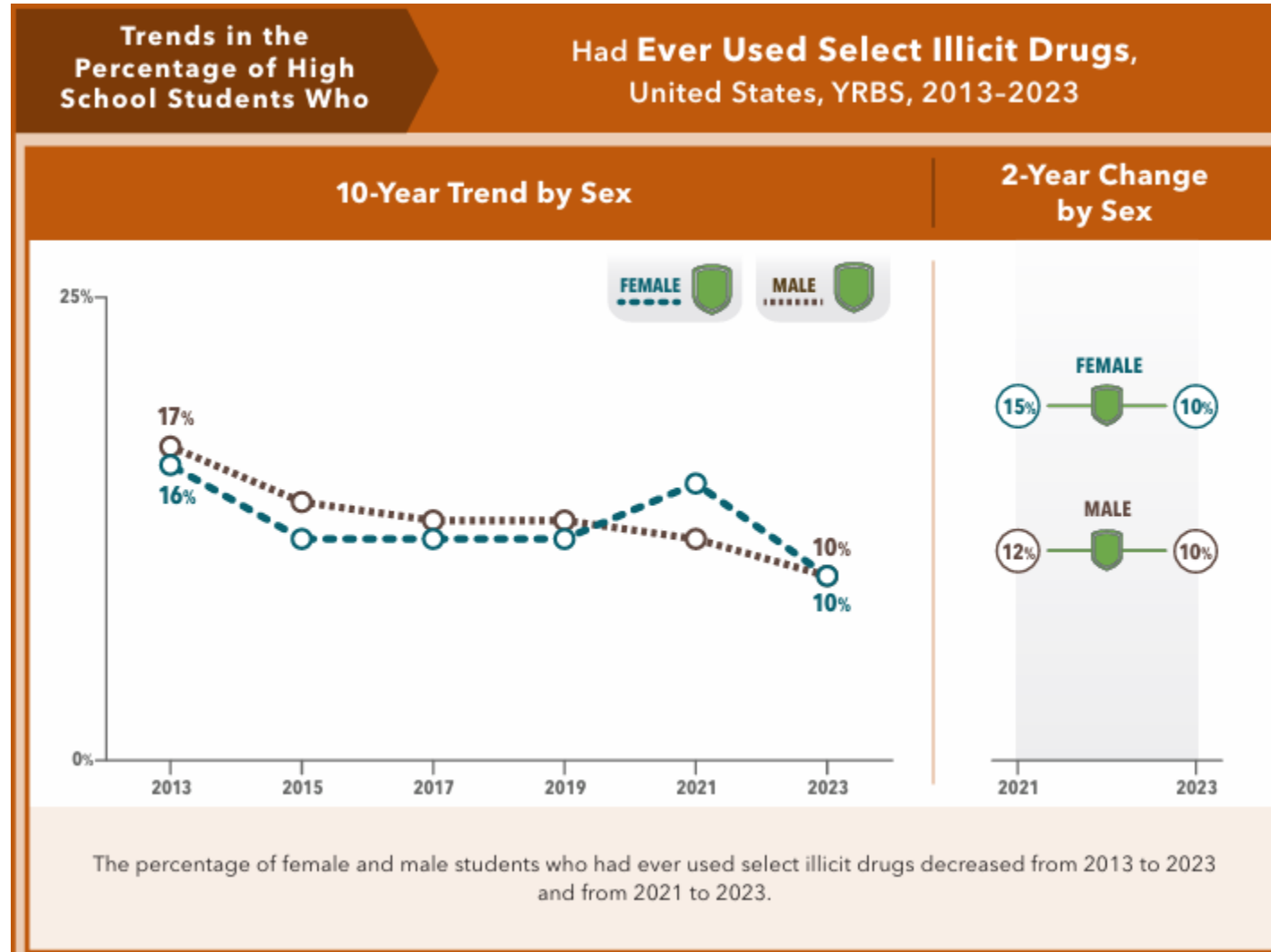
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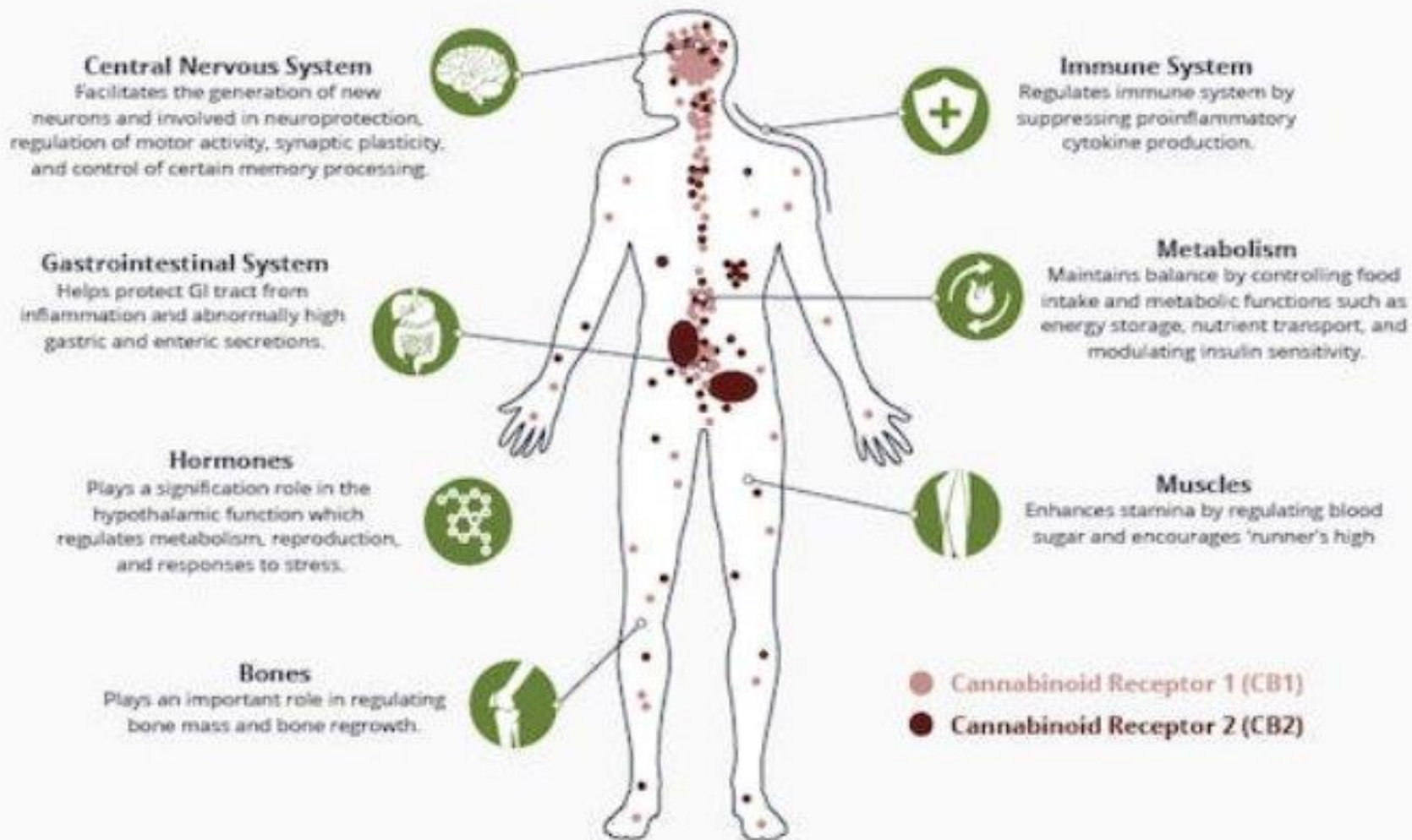
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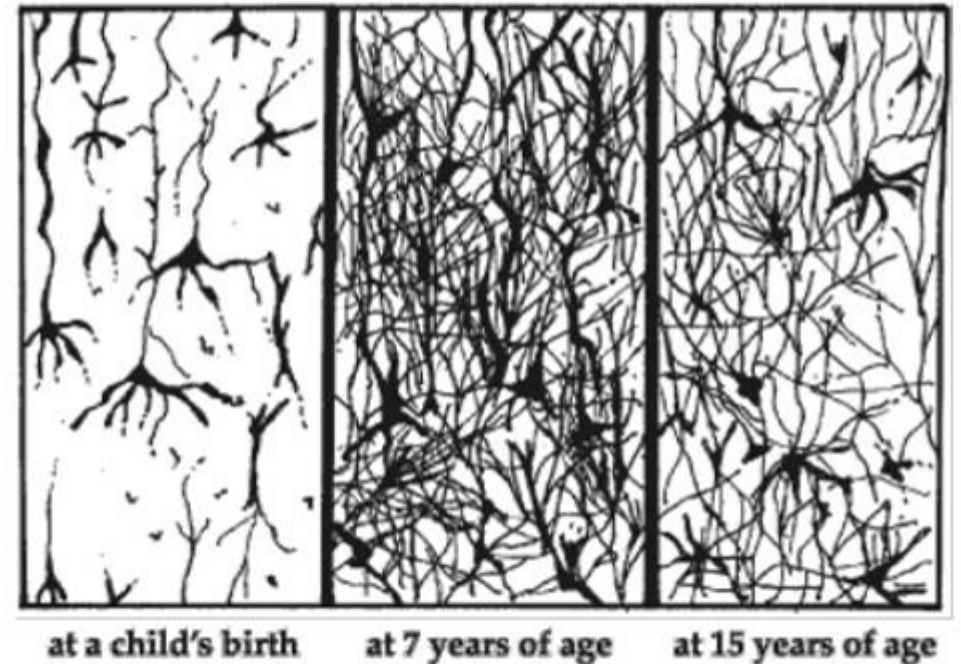


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 - 2% THC provided no benefit
 - 4% THC provided significant pain decrease
 - 8% THC caused increased pain or hyperalgesia

Neurocognitive Adverse Effects

- Because of role in the prefrontal cortex and hippocampus, maturation of circuits regulating attention, executive functioning, and memory can be affected by cannabis use during adolescence (Rubino, 2009)
- Persistent neurocognitive changes and lower functioning even after abstaining from cannabis use, even after a year (Meier, 2012)
- Cannabis use was adverse effects on IQ and executive functioning and declines in neural connectivity (Camchong, 2017)
- Those who start using before 17 yo have reduced odds of high school graduation, more likely to have cannabis use disorder, more likely to use other illicit substances and tobacco, and more suicide attempts (Silins, 2014)

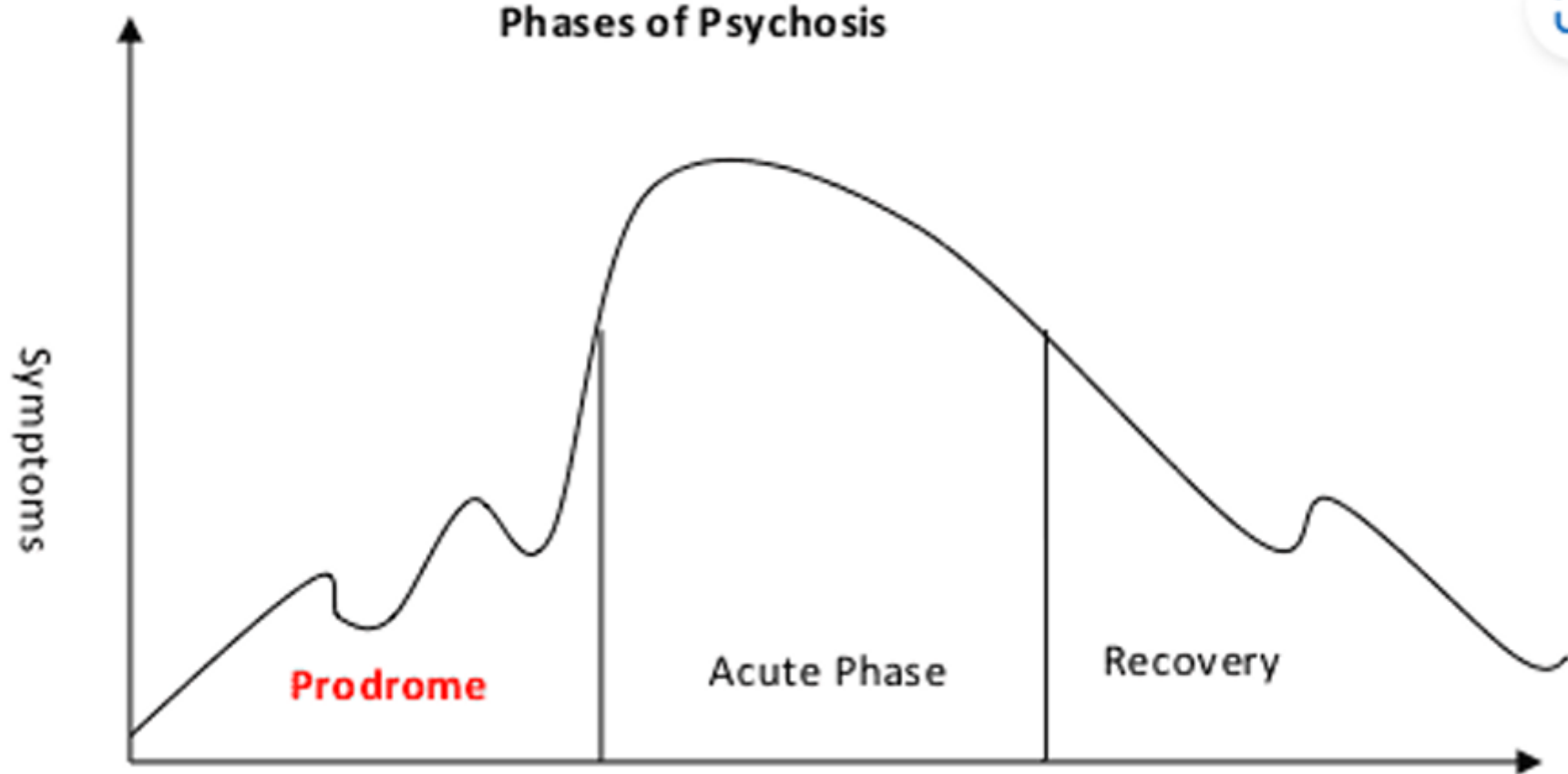


Psychosis

- A range of conditions that affect the mind in which there has been some loss of contact with reality
- Hallucinations and delusions can be very real and distressing
- Also changes to thought processes, mood, sleep, and behavior
- Majority of cases first occur between 13-30
- Use of THC in particular may trigger psychosis in certain individuals, especially with earlier use and more potent strains
- Accelerated loss of grey matter volume in those with schizophrenia



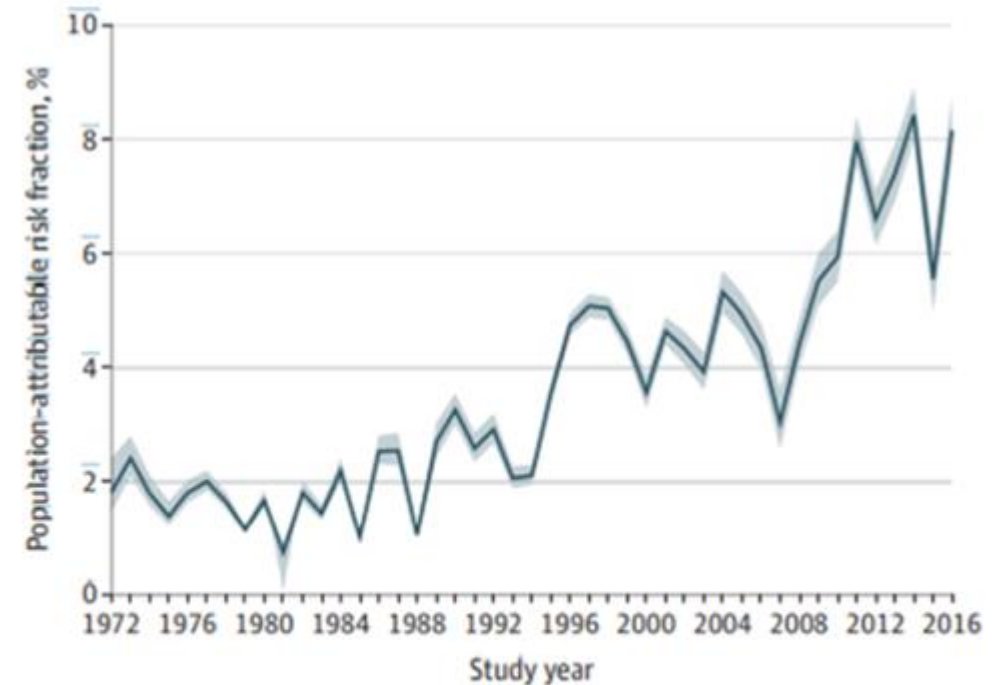
Phases of Psychosis



Increased potency in past 2 decades has resulted in a 4-fold increase in cannabis use and Schizophrenia

- Very large longitudinal population-based study of **7,186, 834 individuals** in Denmark
- The population-attributable risk fraction for cannabis use disorder in schizophrenia increased from approximately 2% in the period to 1995 to approximately 6% to 8% since 2010.
- This study challenges the often-cited argument against causality that an expected increase in cases of schizophrenia attributable to cannabis use has not been observed.
- Hjorthøj C et al. JAMA Psychiatry July 21, **2021**

Figure 2. Development of the Population-Attributable Risk Fraction (PARF) of Cannabis Use Disorder in Schizophrenia in Denmark



Shaded areas indicate 95% CIs.

Credit to Dr. Elizabeth Stuyt, MD

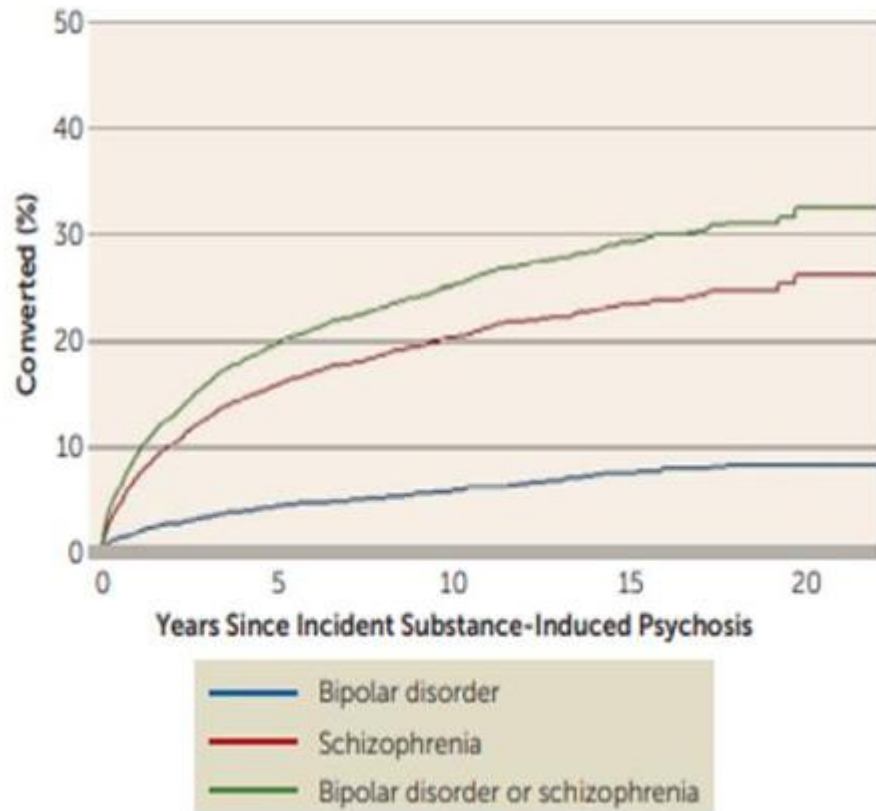
Marijuana and Psychosis

- Ten European and one Brazilian site, 901 pts c 1st episode of psychosis, 1237 healthy controls (Lancet)
- Daily marijuana use and high-potency marijuana (THC>10%) are strongest predictors of a psychotic episode
- Individuals with high potency MJ 1.6 times more likely to develop psychosis than non-users
- High potency and daily use 5 times more likely to develop psychosis than non-users
- 12.2% of episodes of 1st episode psychosis could be prevented, rising to 30.3 % in London and 50.3% in Amsterdam



Rates of conversion to schizophrenia or bipolar disorder after substance-induced psychosis

FIGURE 1. Rates of Conversion to Schizophrenia and Bipolar Disorder Following Incident Substance-Induced Psychosis in a Registry Study (N=6,788)



- 32.2% of patients with substance-induced psychosis later converted to either bipolar disorder or schizophrenia
- Highest conversion rate (47.7%) was for cannabis-induced psychosis
- Young age associated with a greater risk of conversion, risk highest in the range of 16-25 years
- Self-harm after an episode of substance-induced psychosis also linked with a greater risk of conversion to schizophrenia or bipolar disorder

Epub 2021 Feb 22.

Cannabis use in adolescence and risk of psychosis: Are there factors that moderate this relationship? A systematic review and meta-analysis

Sarah Kanana Kiburi ^{1 2}, Keneilwe Molebatsi ^{3 4}, Vuyokazi Ntlantsana ⁴, Michael T Lynskey ⁵

63 studies in narrative review, 18 studies in meta-analysis

Important factors for psychosis risk:

- age of onset of cannabis use
- frequency of cannabis use
- exposure to childhood trauma
- concurrent use of other substances
- genetic factors

Biggest risk factors with cannabis for psychosis or schizophrenia

- Using cannabis before the age of 16; best to use after brain maturation
- Dose-dependent relationship of risk
- Any cannabis use associated with a 40% increased risk of psychosis
- Higher frequency and potency increases risk and severity of psychotic symptoms
- Those with a family history of psychosis are 2.5-10 times more likely to develop a psychotic illness

Prevalence of cannabis use in early psychosis

- 33-54% of individuals with clinical high risk symptoms use cannabis
- 22-50% of individuals with first episode of psychosis use cannabis
- Cannabis use increases risk for having psychosis symptoms, both attenuated and acute
- Youth at CHR-p may use cannabis to alleviate depression, anxiety, or negative symptoms
- After the onset of positive symptoms, may be used as a way of coping with those symptoms
- Earlier age of use and higher usage of high-THC is associated with poorer outcomes

Cannabis and Bipolar Disorder



- Relatively well-known association between marijuana and psychotic spectrum illnesses
- Several articles have shown that marijuana may worsen manic symptoms in those with bipolar disorder
- Cannabis may also be a causal risk factor, with an increased incidence of up to three-fold
- *Cannabis use and mania symptoms: a systematic review and meta-analysis, Gibbs, M, et al; J Affective Disord Jan 2015*

Cannabis and Depression

- Meta-analysis of 11 studies and 23.317 individuals
- OR of developing depression in MJ users vs non-users is 1.37 (95% CI 1.16-1.62)
- OR of anxiety not statistically significant 1.18 (95% CI 0.84-1.67)
- OR of suicidal ideation of 1.50 (95% CI 1.11-2.03)
- OR for suicide attempt of 3.46 (95% CI 1.53-7.84)



(Gobbi, 2019)

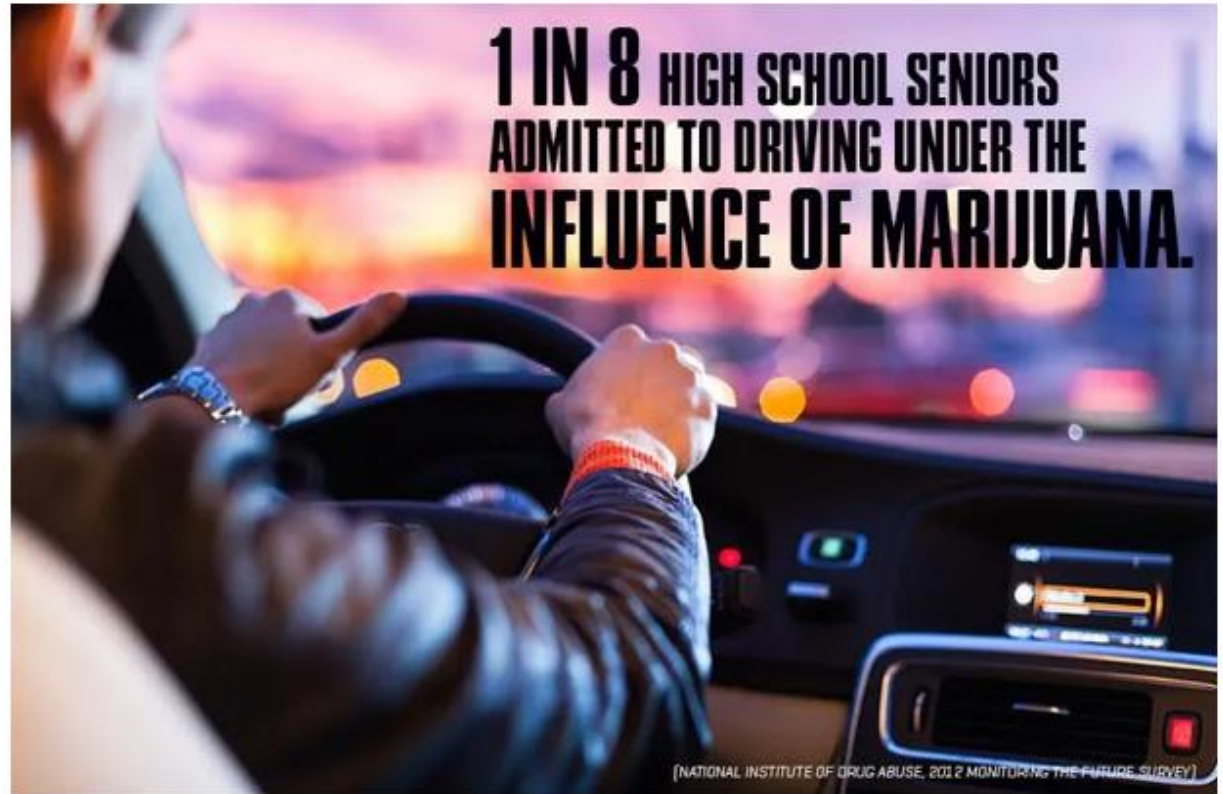
Cannabis and Anxiety



- Anxiety is often cited by adolescence as a reason they use cannabis
- Anxiety is one of the most common disorders
- Acute use of MJ can either mitigate or cause anxiety; CBD often cited as being more helpful
- Anxiety returns when person is no longer using, having not learned any skills
- 27 adolescent studies: 67% found a positive relationship between anxiety and MJ use, but relationship was unclear (causal or incidental)

Cannabis Use and Sequellae

- Most adolescents do not perceive MJ use as harmful or addictive
- As opposed to ETOH, drivers feel MJ is safer to use while driving, yet do not understand the effects (Keyes, 2016)
- Animal studies show MJ does prime the brain to the effects of other substances
- Those who use MJ have a 2.78 increased risk of opiate use disorder, as well as increased risk of stimulants, cocaine, and injection drugs (Olfson, 2018)
- 8-12% of MJ users will develop moderate to severe cannabis disorders
- Withdrawal is not fatal, but within a week of stopping can be linked to irritability or aggression, anxiety, decreased appetite, depressed mood, abdominal pain, tremor, fever chills and headaches



Vignettes

- 19 yo patient initially presented with 'cannabis-induced' psychosis, continued after abstinence to believe he was the anti-Christ, thought he was broadcasting his thoughts, paranoia, seeing colors and vibrations, multiple hospitalizations. Initially responded to medications, but stopped medication and had reoccurrence of symptoms
- 23 yo medical student, tried cannabis twice and developed a psychotic illness; was able to manage symptoms with risperidone, but has continued to notice a change in the ability to process information
- 15 yo who was smoking and vaping regularly, became convinced he was going to be killed by a neighbor, asked an acquaintance to bring him a gun before changing his mind.
- 16 yo using cannabis daily who became paranoid that there were figures following them at school, hanging at the end of the bed, starting talking to them in school
- 15 yo who believed mother was trying to poison them and stopped eating
- 14 yo who was convinced there were people trying to break in to their house, ran off thinking 'they' were chasing them
- 15 yo who thought TikTok was sending algorithms based on their feelings to control them
- 17 yo who had a manic episode after smoking cannabis at a party; up for 6 days, stopped going to class or eating regularly, was hospitalized

Youth Cannabis Use Prevention

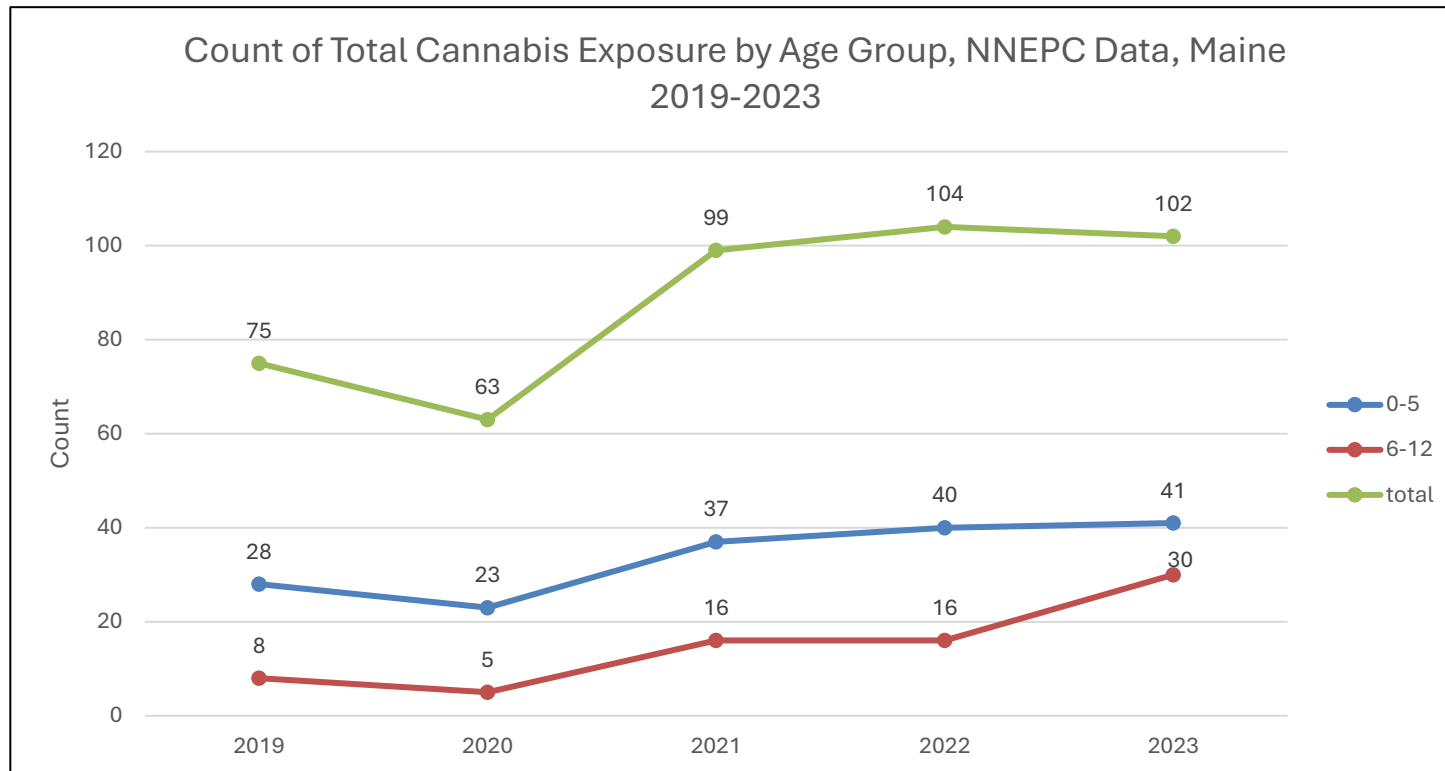
Maine Center for Disease Control and Prevention
Division of Disease Prevention

Presentation to the Joint Standing Committee on
Health and Human Services

January 22, 2025

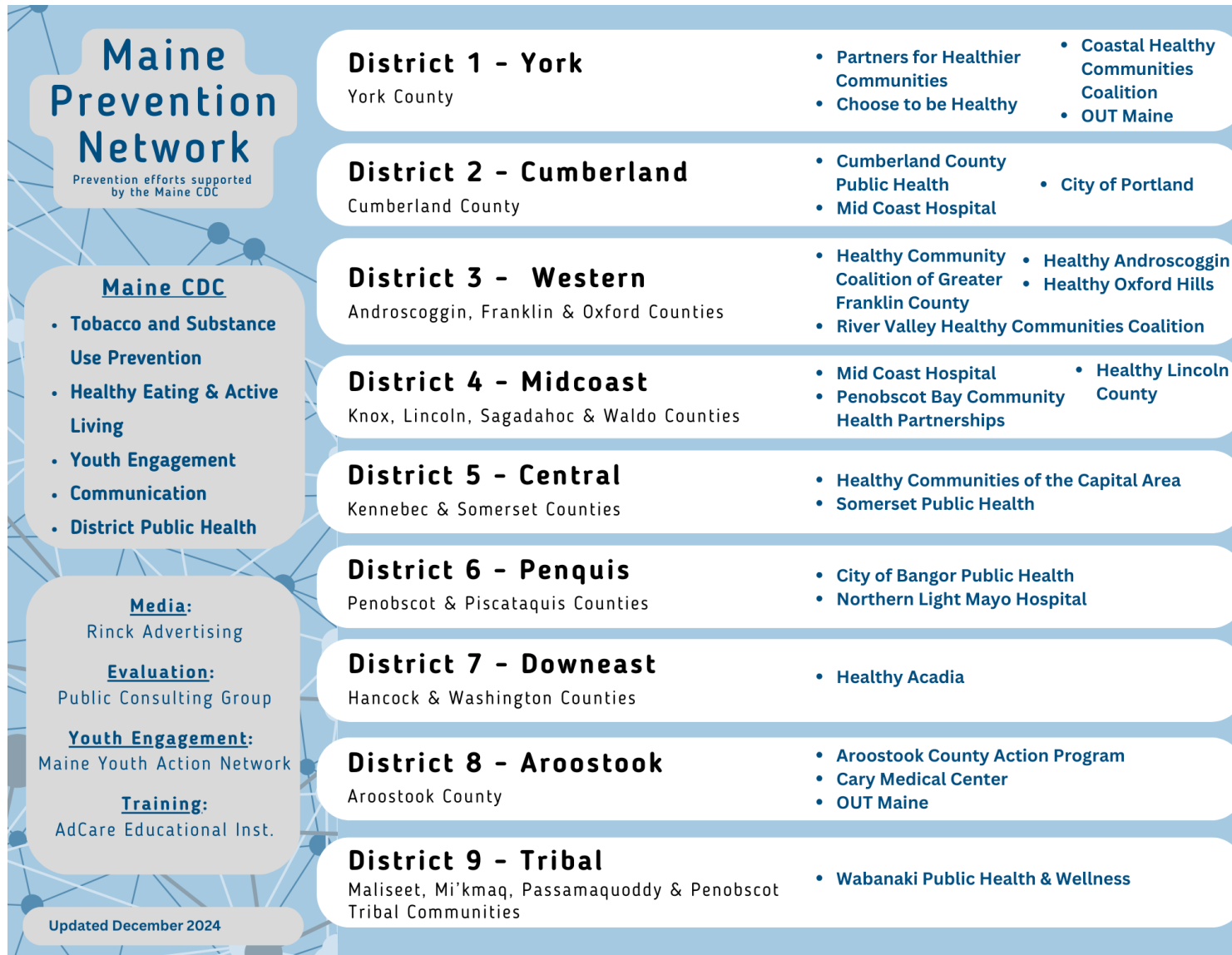


Northern New England Poison Center (NNEPC) Maine Cannabis Exposures Data, 2019-2023



- Data reflects cannabis exposures that were reported to NNEPC
- In 2023:
 - 41 (40.2%) were among children ages 0-5
 - 30 (29.4%) were among children ages 6-12

Maine Prevention Network



A collaboration between Maine CDC's Tobacco and Substance Use Prevention and Control and Chronic Disease Programs and District-level community partners who work statewide to implement evidence-based prevention programming for Substance Use, Tobacco and Obesity Prevention, Youth Engagement and Empowerment, and Mass-Reach Health Communications.

Risk Factors for Youth Cannabis Use

Risk Factors for Youth Cannabis Use exist at various levels, including:

Individual and Peer

- Perceptions of peer use
- Low perception of risk/harm of using cannabis
- Sensation-seeking

Family

- Use of cannabis by parents or siblings
- Limited parental monitoring
- Parental acceptance of substance use

Community (School, Policy, Social Norms)

- Limited sense of belonging to school and community
- Widespread availability to cannabis/perceived ease of access
 - E.g., high density of access in a community through retail, delivery, and off-premise sales
- Exposure to cannabis marketing
- Advertising and branding that appeal to youth
- New products designed to attract youth

Cannabis Use Prevention Efforts

- Evidence-based programs in schools and youth-serving organizations
 - Many programs are focused on skill building, refusal skills, and goal-setting
 - Best practices are to avoid one-time assemblies and programs including scare tactics
- Prevention of access in homes and from families
 - Social hosting prevention
 - Safe storage
 - Partnerships with retailers, families, distribution through community events and settings
- Efforts to enhance connection to school and community
- Restorative school policies
 - Utilizing programs like the [Student Intervention Reintegration Program \(SIRP\)](#) for students who violate school substance use policies
- Social norms messaging
- Policy
 - Decision-maker education
 - Support with school and organizational policy
- Mass-Reach Health Communications- [Good to Know Maine](#)
 - Upcoming campaign run will focus on Lower-Risk Cannabis Use Guidelines
- Statewide collaboration between Maine CDC, OCP, and local partners

Good to Know Maine



As a parent, it's good to know how to **TALK** with your kid about cannabis.



It's good to know how cannabis can affect your **MENTAL HEALTH.**

Public Health Opportunities to Improve Cannabis Prevention Efforts

Maintaining packaging/labeling and marketing regulations that do not appeal to children

- Plain packaging, limiting pictures/imagery that may appeal to kids
- Including the universal symbol on all product packaging, including in the Medical Use program

Sustainable funding for evidence-based community prevention efforts

- Bolster statewide substance use prevention efforts for youth and parents

Continued education with families and parents, as well as healthcare and social services providers

Resources

[SAMHSA's Preventing Youth Access to Marijuana](#)

Getting It Right From The Start: [Principles for Protecting Youth, Public Health & Equity in Cannabis Regulation](#)

[Maine Prevention Network](#)

[Good to Know](#)

Contact

Maine Center for Disease Control and Prevention

Megan Scott, Substance Use Prevention Program Manager

Megan.Scott@maine.gov



Maine’s universal symbol (pictured) is an important visual indicator on edible adult use cannabis products



The universal symbol makes individuals aware of an edible adult use cannabis product that may otherwise look like a candy, chocolate bar, or other non-cannabis product outside of its original packaging.

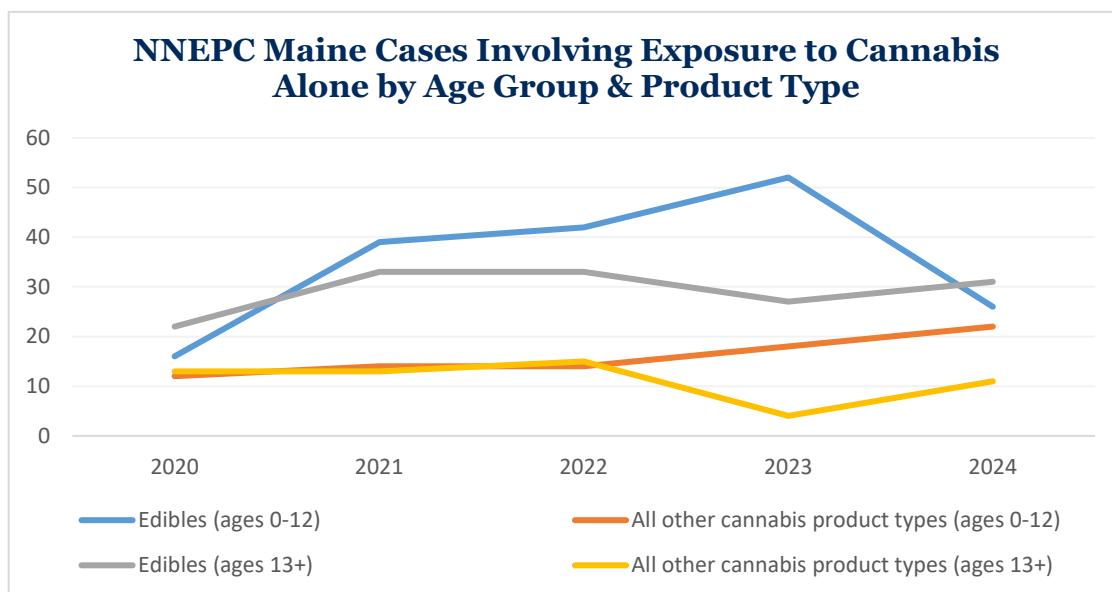
Examples of *compliant* edible adult use cannabis products:




Examples of *non-compliant* edible adult use cannabis products:



Data on cannabis exposures by age group and product type



The Northern New England Poison Center (NNEPC) has indicated that they tend to get fewer calls after clinicians have seen a few of the same poisoning cases and know what to do. It is also unclear whether the edible-related exposures are a result of edible adult use cannabis products or edible cannabis products from Maine’s medical or illicit markets that do not have a universal symbol requirement.



**Overview of OCP's Initiatives:
Public Health & Youth Cannabis Use**

Lisa Roberts
Deputy Director of Strategic Initiatives

Office of Cannabis Policy
Maine Department of Administrative and Financial Services
<https://www.maine.gov/dafs/ocp>


1

OCP's Mission & Public Health Purview

Mission Statement - To ensure the health and safety of all Mainers by effectively and responsibly licensing and regulating cannabis establishments.

Intersections with public health:

- Public health campaigns (education & behavior change)
- Data sharing with public health organizations
- Contributes funding for MIYHS cannabis questions
- Participant in CDC Cannabis & Tobacco Workgroups
- Independent initiatives to address emerging trends



2

Maine's Two Cannabis Programs

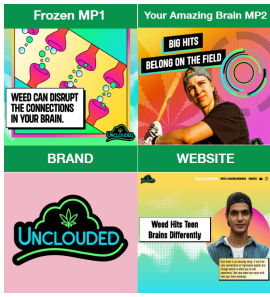

Adult Use <small>Cannabis Legalization Act (Adult Use)—Title 28-B</small>	Medical Use <small>Maine Medical Use of Cannabis Act—Title 22, Chapter 55B-C</small>
<ul style="list-style-type: none"> • Mandatory testing • Inventory tracking • Excise and sales tax • Universal symbol • Edible THC limits • Consumers ages 21+ 	<ul style="list-style-type: none"> • Voluntary testing • No inventory tracking • Sales tax • Signifier on edibles • No edible THC limits • Patients ages 18+*

3

OCP Public Health & Safety Campaign: Unclouded

The **Unclouded** campaign provides important information about the risks of using cannabis as a teen.

- When: October 2022 – August 2023
- Target: Teens (ages 13-17)
- Goals: Delay initiation or prevent use
- Tactics: Digital campaign & website

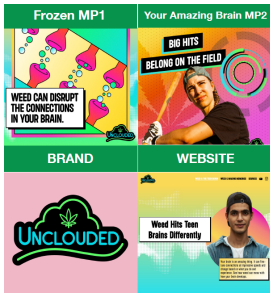




4

OCP Public Health & Safety Campaign: Unclouded

Campaign Outcomes

- **86%** of surveyed teens were aware of the campaign
- **83%** of teens who were aware of the campaign had heard the fact, “Using weed can impact your ability to process, focus and react,” compared to only **17%** of teens who were campaign unaware
- **56%** of campaign aware teens reported using cannabis less often in the last 6 months versus **29%** of campaign unaware teens

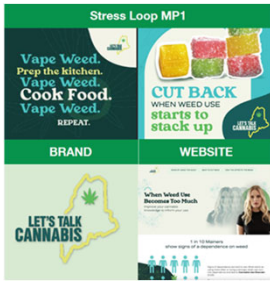



5


OCP Public Health & Safety Campaign: Let's Talk Cannabis

The **Let's Talk Cannabis** campaign provides important information for young adults about recognizing the signs of a dependency on cannabis.

- When: December 2022 – March 2023
- Target: Young Adults (ages 18-25)
- Goals: Prevent the escalation of use or de-escalate use
- Tactics: Digital campaign & website



Stress Loop won the 2023 Silver MUSE Award in the "Video - Public Service & Activism" category!





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OCP Public Health & Safety Campaign: Let's Talk Cannabis

Campaign Outcomes

- **20%** of campaign unaware young adults reported that they intend to use daily in the next 12 months versus only **6%** of those who were campaign aware
- **70%** of campaign aware young adults agreed that including cannabis into your daily routine can increase THC dependency and become a problem, versus only **56%** of those unaware
- **62%** of the campaign unaware *had not* changed how often they use cannabis in the past 6 months while only **36%** of the campaign aware stated they had not changed how often they use






7

OCP Public Health & Safety Campaign: LTC Maine Parents

The **Let's Talk Cannabis Maine Parents** campaign provides information and resources for talking to teens about cannabis.

- Target: Parents and Adult Mentors (of ages 11-17)
- Goals: Encourage cannabis prevention conversations with youth; mental health focus
- Tactics: Digital campaign, website, influencers, & toolkit






8

OCP Public Health & Safety Campaign: LTC Maine Parents

Campaign Outcomes

- **71%** were aware of the campaign after 8 weeks of flighting
- **89%** had already discussed cannabis with their teens, but **48%** reported having a conversation with their teen in the past 3 months because of the campaign
- **76%** agreed the campaign materials helped them recognize that teen cannabis use comes with risks, especially for their mental health

9

Safe Storage for ME Pilot Program

Program Overview

- 200+ medical and adult use retail locations statewide to distribute free lockable storage bags
- 5,000 bags purchased & delivered directly to participating retailers
- ~2,500 survey responses

Consumer/Patient Feedback

"This product is very helpful and I use it every day"

"This is an awesome program for safe cannabis storage / use. Thank you for spearheading this"

"Bigger bags to be able to handle more edibles as this is what I'm most afraid of my children getting into"

"My experience is I feel so much better being able to trust my medication will be hard to access. And only available to myself."

"I think it's great and it will help parents to safely store any marijuana products so young kids can't accidentally see or touch it"

Survey Highlights

- 62% of respondents are parents and 83% have pets in their home
- 40% of all respondents had never heard of safe storage before
- 67% of those who had never heard of safe storage have minors in their home

FREE Safe Storage Bag
Safe Storage for ME



10

Regulations & Marketing to Youth – Background


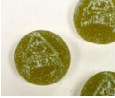
- The rules governing Maine's Medical Use of Cannabis Program were last updated in the Spring of 2018 and do not address packaging, labeling, advertising, or marketing.
- The *Cannabis Legalization Act* in 2019 contained several prohibitions for adult use cannabis packaging, labeling, advertising, and marketing that were further defined in the 2019 Adult Use Cannabis Program Rule. Such prohibitions included:
 - Marketing, advertising, and signs that had a high likelihood of reaching persons under 21 years of age or that were specifically designed to appeal to persons under 21 years of age
 - Packaging and labeling that was in violation of a federal trademark law, that was specifically designed to appeal to a person under 21 years of age, or that used a label or packaging that depicts a human, animal, or fruit
 - Cannabis products manufactured in the distinct shape of a human, animal, or fruit or that were specifically designed to make the product appeal to a person under 21 years of age

11

Regulations & Marketing to Youth – Current State

During the Second Regular Session of the 131st Legislature, several bills were enacted that rolled back existing public health safeguards.

- **P.L. 2023, ch. 641** (Emergency, Law without Signature, April 21, 2024), *An Act to Change the Requirement for Edible Cannabis Products to Be Stamped or Embossed on Each Serving with a Universal Symbol*
- **P.L. 2023, ch. 679**, *An Act to Protect Liberty and Advance Justice in the Administration and Enforcement of the Cannabis Legalization Act and the Maine Medical Use of Cannabis Act*

Above: Formerly compliant and non-compliant universal symbol on gummies

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Thank you!

Office of Cannabis Policy
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<https://www.maine.gov/dafs/ocp>

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