

# SUMMARY OF RESEARCH ARTICLES BY JOHNNY'S AMBASSADORS

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## WHAT IS HIGH-THC MARIJUANA?

2022

[Association of cannabis potency with mental ill health and addiction: a systematic review](#) – July 2022. Higher concentrations of tetrahydrocannabinol or THC – the part of the marijuana plant that makes you high – are causing more people to become addicted in many parts of the world, a new review of studies found. Overall, use of higher potency cannabis, relative to lower potency cannabis, was associated with an increased risk of psychosis and CUD.

[Cannabis industry lobbying in the Colorado state legislature in fiscal years 2010-2021 – January 2022.](#)

The cannabis industry spent over \$7 million (inflation adjusted) from FY 2010-2021 to lobby the Colorado legislature on 367 bills. Over \$800,000 (11% of total cannabis spending) was from out-of-state clients. In 48% of lobbyist reports lobbyists did not disclose their funder's cannabis affiliation, and cannabis organizations used strategies that may have obscured the true amount and source of funding. Lobbyists and agencies concurrently represented the alcohol, tobacco, and cannabis industries, possibly facilitating inter-industry alliances when interests align. The cannabis industry dedicated significant resources towards lobbying the Colorado State Legislature on behalf of policies intended to increase cannabis use

[Closing the Loophole on Hemp-Derived Cannabis Products – A Public Health Priority](#) – Nov. 2022. State

and federal regulators should prioritize new hemp policies that ensure prohibition of sale to minors; set requirements for testing, packaging, and labeling; and place limits on potency and concentration of psychotropic products. The public health implications of psychotropic, hemp-derived cannabis products remain understudied. However, the lack of regulation over the marketing and synthesis of these products, combined with the widespread availability, warrants national surveillance and new hemp policies that close loopholes and prioritize public health.

[Marijuana and hallucinogen use among young adults reached all-time high in 2021.](#) Marijuana and hallucinogen use in the past year reported by young adults 19 to 30 years old increased significantly in 2021 compared to five and 10 years ago, reaching historic highs in this age group since 1988, according to the Monitoring the Future (MTF) panel study. Past-year, past-month, and daily marijuana use (use on 20 or more occasions in the past 30 days) reached the highest levels ever recorded since these trends were first monitored in 1988. The proportion of young adults who reported past-year marijuana use reached 43% in 2021, a significant increase from 34% five years ago (2016) and 29% 10 years ago (2011). Marijuana use in the past month was reported by 29% of young adults in 2021, compared to 21% in 2016 and 17% in 2011. Daily marijuana use also significantly increased during these time periods, reported by 11% of young adults in 2021, compared to 8% in 2016 and 6% in 2011.



[Recreational cannabis legalization alters associations among cannabis use, perception of risk, and cannabis use disorder treatment for adolescents and young adults](#) – November 2022. Following recreational legalization: 1) adolescent and young adult past-month cannabis use prevalence increased; 2) among both adolescents and young adults, the association of lower perception of risk of harm with higher cannabis use prevalence was strengthened; 3) among adolescents, the association of higher cannabis use prevalence with higher CUD treatment admissions was suppressed; and 4) among young adults, an association of higher cannabis use prevalence with lower CUD treatment admissions emerged.

## 2021

[Cannabis Vaping Skyrockets in High School Students](#) – May 2021. Just as reports of severe lung illnesses related to vaping began to make headlines in 2019, rates of cannabis vaping among high school students were soaring, according to high-quality survey data.

[Characteristics of Adults Aged ≥18 Years Evaluated for Substance Use and Treatment Planning](#) – June 2022. MARIJUANA IS THE 2ND MOST PREVALENT SUBSTANCE PATIENTS WITH PSYCHIATRIC PROBLEMS PRESENTED WITH IN THE U.S., over opioids, stimulants, heroin, sedatives, cocaine and fentanyl. Over 32 percent of respondents admitted to polysubstance use in the past 30 days, which refers to using two or more substances. The most common polysubstance combinations among the respondents were alcohol and cannabis at 17.2 percent, followed by cannabis and illicit stimulants at 3.7 percent, then alcohol and prescription opioids at 3.4 percent.

[Demystifying the endocannabinoid system](#) | Ruth Ross | TEDx Mississauga – August 2021. THC actually acts as an alternative key for the endocannabinoid receptor, so it fits into the lock, as it were, of the endocannabinoid receptor. And what it does when it binds to that receptor is it either mimics the endocannabinoid system or it disrupts the endocannabinoid system

[Five Things to Know about Delta-8 Tetrahydrocannabinol – Delta-8 THC](#) – Sept. 2021. It is important for consumers to be aware that delta-8 THC products have not been evaluated or approved by the FDA for safe use in any context. They may be marketed in ways that put the public health at risk and should especially be kept out of reach of children and pets. [Frequency of adolescent cannabis smoking and vaping in the United States: Trends, disparities and concurrent substance use, 2017–19](#) – May 2022. Cannabis use with vaping is accelerating; frequent cannabis vaping is especially increasing, with consistent increases across almost all adolescent demographic groups. Cannabis use among US adolescents remains highly associated with other substance use.

[Increases in Frequent Vaping of Cannabis Among High School Seniors in the United States, 2018–2019](#) – May 2021. Frequent vaping of cannabis significantly increased from 2.1% to 4.9%, a 131.4% increase. This increase was larger than the increase for any vaping of cannabis (which increased 85.9%). Notable significant increases occurred among students aged ≥18 years (a 154.9% increase), female students (a 183.5% increase), those who go out 4–7 evenings per week (a 163.0% increase), and those reporting past-year nonmedical prescription opioid use (a 184.7% increase).

[Joint perceptions of the risk and availability of Cannabis in the United States, 2002-2018](#) – July 2021. Those who perceived marijuana as low risk were 6 times more likely to have used the drug in the

past year compared with those who perceived it to be high risk. People who perceived marijuana to be available were 5 times more likely to have used it in the past year than those who perceived it to be unavailable. When marijuana is perceived as both low risk AND available, people were 22 times more likely to have used the drug in the past year than those perceiving the drug as high-risk and unavailable. [Lower-Risk Cannabis Use Guidelines \(LRCUG\) for reducing health harms from non-medical cannabis use: A comprehensive evidence and recommendations update](#) – Aug. 2021. Researchers from universities and institutions in many nations from around the world have updated guidelines for lower-risk marijuana use based on new evidence published since 2016.

[Marijuana use at historic high among college-aged adults in 2020](#) – Sept. 2021. Marijuana use continued to rise among college students over the past five years and remained at historically high levels among same-aged peers who are not in college in 2020, according to survey results from the [2020 Monitoring the Future \(MTF\) panel study](#).

[Op-Ed: Children and ‘Medical’ Marijuana by Dr. Libby Stuyt](#) – February 2021 <https://www.medpagetoday.com/publichealthpolicy/publichealth/90980>. Marijuana has been around for thousands of years and has been used medicinally for various ailments since 2700 B.C. Up until the 1990s, the delta-9-tetrahydrocannabinol (THC) content in the plant was under 2%-3%. When Colorado legalized marijuana for medical use in 2000, the highest concentration of THC in the plant was 5% and there were no concentrated products like “wax,” “shatter,” or “dabs.” Over the last 20 years, without any state governmental regulation to limit potency, the industry has dramatically increased the concentration of THC to where the average in the plant is now 18.8%. They have also created a range of concentrates with the average THC potency of 69.4%, some up to 95% THC.

[Prevalence of Adolescent Cannabis Vaping: A Systematic Review and Meta-analysis of US and Canadian Studies](#) – Oct. 2021. This systematic review and meta-analysis reviewed 17 unique studies from the US and Canada, with a total of 198 845 adolescents, and found that the lifetime prevalence of cannabis vaping doubled from 2013 to 2020 (6.1% to 13.6%), past 12-month use doubled from 2017 to 2020 (7.2% to 13.2%), and the 30-day prevalence of cannabis vaping increased 7-fold from 2013 to 2020 (1.6% to 8.4%). Preference for cannabis products may be shifting from dried herb to cannabis oil. The findings of this study suggest that more effective prevention and response measures are required to mitigate the increasing prevalence of cannabis vaping among adolescents.

[Recreational Marijuana Legalization and Use Among California Adolescents: Findings From a Statewide Survey](#) – February 2021. Marijuana use among adolescents in CA increased after the state legalized the drug in 2016. Adolescent use had been steadily decreasing before legalization. There was an 18 percent increase in the likelihood of lifetime use and a 23 percent increase in past-30-day use.

[Vaping marijuana linked to lung injury in teens, worse than cigarettes](#) – March 2021. Teens are about twice as likely to report “wheezing or whistling” in the chest after vaping marijuana than after smoking cigarettes or using e-cigarettes, a new study has found. “This surprised us, we thought we would find more negative respiratory symptoms in both cigarettes and e-cigarettes users,” said study author Carol Boyd, co-director of the Center for the Study of Drugs, Alcohol, Smoking & Health at the University of Michigan in Ann Arbor. “Without a doubt, cigarettes and e-cigarettes are unhealthy and not good for lungs. However, vaping marijuana appears even worse,” she said.

[Young adult compared to adolescent onset of regular cannabis use: A 20 year prospective cohort study of later consequences](#) – January 2021. Cannabis users who began regular use in their teens had poorer

later life outcomes than non-using peers. The larger group who began regular cannabis use after leaving high school accounted for most cannabis-related harms in adulthood. Given the legalization of cannabis use in an increasing number of jurisdictions, we should increasingly expect harms from cannabis use to lie in those commencing use in young adulthood.

## 2020

[Benchmark Youth Drug Use Survey Finds Ongoing Upward Trends in Daily Marijuana Use Over Time](#) – Dec. 2020. Increases in daily marijuana use among 12th graders continue to trend upwards, at 6.9% in 2020, versus 5.8% in 2018. And daily use among 8th graders is still 50% higher than it was just two years ago, and 30% higher among 10th graders.

[Big Marijuana targets teens as much as Juul does. Will Arizona also sue them for it?](#) – February 2020. Arizona Attorney General Mark Brnovich sued two vaping companies earlier this year for illegally targeting teens and misleading consumers. Big Marijuana companies are doing exactly the same thing. Brnovich said the companies “appealed to, targeted, and exploited a generation of youth.” One of every five Arizona teens say they’ve vaped in the past 30 days, according to the most recent [Arizona Youth Survey](#).

[Changes in delta-9-tetrahydrocannabinol \(THC\) and cannabidiol \(CBD\) concentrations in cannabis over time: systematic review and meta-analysis](#) – Nov. 2020. Cannabis products with high delta-9-tetrahydrocannabinol (THC) concentrations carry an increased risk of addiction and mental health disorders, while it has been suggested that cannabidiol (CBD) may moderate the effects of THC. Concentrations of delta-9-tetrahydrocannabinol (THC) in international cannabis markets increased from 1970 to 2017 while cannabidiol (CBD) remained stable. Increases in THC were greater in cannabis resin than herbal cannabis.

[Compilation of marijuana research by George Spicka](#) 2020. George Spicka notes that there is a steady rising tide of testimony, evidence, research, and studies, showing that America is now facing a health crisis that rivals that of the one perpetuated by the tobacco industry in the marijuana industry. As a former addict, he is sharing news articles that reveal the dangers of the effects of marijuana.

[Dabbing and Vaping Soar Among Colorado High School Students](#) – August 2020. The number of Colorado high school students who use marijuana hasn’t changed much since legalization, but how they use it has changed dramatically. Different high-school students across the state, reveal that dabbing concentrates have more than doubled in four years, from 5.1% in 2015 to 10.6% in 2019, and vaping them has almost quintupled, from 4.3% in 2015 to 20.4% in 2019. Students in Denver who used the drug in the past 30 days, reveal that students are consuming high levels of concentrates with THC levels that can reach 90 percent.

[Dabbing’ Concentrated THC Is Troubling New Trend Among Teens](#) – February 2020. A much more potent way to use marijuana called “dabbing” – smoking concentrated THC, the chemical in marijuana that gets you high – is getting more popular among teens. NBC’s Gabe Gutierrez joins TODAY to tell you what parents need to know.

[Examining Associations Between Licensed and Unlicensed Outlet Density and Cannabis Outcomes From Preopening to Post Opening of Recreational Cannabis Outlets](#) – Dec. 2020. A new study

published in the American Journal of Addiction found that higher densities of marijuana storefronts as was associated with an increased likelihood that youth would use marijuana and consume more of it.

[In an exploratory randomized, double-blind, placebo-controlled, cross-over study, psychoactive doses of intravenous delta-9-tetrahydrocannabinol fail to produce antinociceptive effects in healthy human volunteers](#) – July 2020. In this exploratory controlled study, intravenous THC lacked significant antinociceptive properties in experimental model of acute pain (it failed to reduce pain using different methods of pain induction).

[Low Potency Cannabis: Towards a Rational Policy](#) – Peak Health Center. Marijuana has been used as medicine for thousands of years but the use and consumption of it has changed dramatically. The potency of marijuana and cannabis concentrates has increased dramatically over the past 50 years, posing new potential risks and dangers that should be carefully considered. This article is a neutral, scientific medical examination of marijuana. It is intended to help lawmakers and congressmen come up with a rational policy, nationwide.

[Mapping cannabis potency in medical and recreational programs in the United States](#) – March 2020. In conclusion, our findings suggest that medicinal programs are operating in a similar fashion to recreational programs based on the products they offer online (high THC), which are not adequate for medical use and could contribute to risky misconceptions towards medicinal cannabis.

[Marijuana – Parent UP Kansas City](#) – Aug. 2020. Many states have legalized marijuana for medicinal and recreational purposes. As laws and norms change, it is easy to confuse the facts about the drug's impact on brain development and public health. Marijuana is often one of the first drugs a teen is offered, and 78 percent of teens say that they have close friends who use marijuana. This new landscape makes it even more crucial that we're clear on one fact: No amount of marijuana use among youth is safe.

[Older people don't know what dabbing is](#) – January 2020. Twenty percent of Americans have either used dabs themselves or know someone who has, and another 29 percent are unsure if they know someone who has used the drug. Half of the youngest millennials (18–24-year-olds) have or know someone who has used the drug. Just three percent of seniors can say the same.

[Risk of Persistence and Progression of Use of 5 Cannabis Products After Experimentation Among Adolescents](#) – more addiction for high THC – Jan. 2020. The persistence of cannabis use was stronger for combustible cannabis and cannabis concentrate than for blunts or edible cannabis, and the association of progression to higher levels cannabis use was stronger for cannabis concentrate than for any other product, suggesting that combustible cannabis and cannabis concentrate may carry a higher potential for use disorder. Combustible cannabis and cannabis concentrate should be targeted in prevention campaigns to reduce the rates of progression to heavy cannabis use in adolescent populations and the adverse health effects that have been associated with heavy cannabis use early in life.

[Tetrahydrocannabinol: harmful even in low doses](#) – March 2020. Results from a recent study show that there are at least transient psychiatric symptoms associated with even relatively low doses of THC. There is sufficient evidence to warn people that using THC could increase their risk of developing psychiatric symptoms or even a psychotic illness.

[The Marijuana Market As An “Essential Service” Threatens Everyone](#) – April 2020. Risks presented by continued marijuana use is not only to the patients themselves, but also to those with whom they interact, both their loved ones and their wider community. Using marijuana not only worsens patients’ physical health, making them more susceptible to infection from Covid-19, but marijuana intoxication further distorts their judgment and undermines their responsible behavior, weakening their self-protection and the protection of those close to them.

[What’s the Deal with Cannabis?](#) – February 2020. When you vape cannabis, you’re inhaling more than just THC. Scientists have discovered that the mist you inhale can contain dangerous chemicals and tiny metal particles that settle in your lungs, causing inflammation and making it hard to breathe. Investigators, who’ve been trying to solve the mystery of what’s made more than 2,000 people sick and killed at least 39 others since March 2019, think a likely culprit is vitamin E acetate, a thickener that illegal sellers add to THC-laced cartridges.

## 2019

[Dabs, Wax, Vaping Weed, Edibles and the Real Impact of High Potency THC Products: What Parents Need to Know](#) – September 2019. Parents should firm up their ‘no use’ messages to teens, as many parents are feeling they are not able to impact their children’s use of weed at all. It is particularly daunting now as it appears our culture is accepting weed as ‘normal’ and the latest fantasy cure to medical and financial woes. No use of cannabis at all is safe for developing teen brains. Parents must speak in terms that are caring, knowledgeable and firm to their tweens and teens and describe the science behind the negative short and long-term effects of high potency THC products.

[Monitoring the Future – The National Institute on Drug Abuse](#) – 2019. Monitoring the Future is an annual survey of 8th, 10th, and 12th graders conducted by researchers at the Institute for Social Research at the University of Michigan, Ann Arbor, under a grant from the National Institute on Drug Abuse, part of the National Institutes of Health. Since 1975, the survey has measured how teens report their drug, alcohol, and cigarette use and related attitudes in 12th graders nationwide; 8th and 10th graders were added to the survey in 1991. 42,531 students from 396 public and private schools participated in the 2019 survey.

[More kids using vape pens to smoke pot, police warn](#) – February 2019. Many vape packages found in Wisconsin appear to be packaged and purchased on the West Coast, in states where marijuana is legal, but they are transported and sold illegally. They are packaged to attract teens. Smoking one THC cartridge is equivalent to smoking three or four joints at the same time, causing psychotic episodes and odd behavior among teens with developing brains.

[National Institute on Drug Abuse – What is Marijuana?](#) – December 2019. Marijuana is the most commonly used psychotropic drug in the United States, after alcohol. Its use is widespread among young people. In 2018, more than 11.8 million young adults used marijuana in the past year. The number of teens in 8th and 10th grades who say they use it daily has increased. With the growing popularity of vaping devices, teens have started vaping THC (the ingredient in marijuana that produces the high), with nearly 4% of 12th graders saying they vape THC daily. In addition, the number of young people who believe regular marijuana use is risky is decreasing.

[Potent pot, vulnerable teens trigger concerns in first states to legalize marijuana](#) – June 2019. With some marijuana products averaging 68 percent THC — exponentially greater than the pot baby boomers once smoked — calls to poison control centers and visits to emergency rooms have risen. In the Denver area, visits to Children’s Hospital Colorado facilities for treatment of cyclic vomiting, paranoia, psychosis and other acute cannabis-related symptoms jumped to 777 in 2015, from 161 in 2005. The increase was most notable in the years following legalization of medical sales in 2009 and retail use in 2014, according to a study in the Journal of Adolescent Health published in 2018.

[Teenagers vaping marijuana at higher rates than ever before, new study says](#) – December 2019. Many educators are concerned about the growing marijuana trend in students. In western Colorado, Olathe Middle and High School Principal Scot Brown shows dozen vape pens and other devices confiscated in just a 4-day period. Almost 50 percent of his students have vaped nicotine or marijuana.

[Teens, Young Adults More Likely to Take Up Marijuana if Parents Use It](#) – November 2019. Researchers found that kids with moms who had used marijuana in the past, but not for at least a year, were 30% more likely to take up marijuana compared to kids with mothers who never used the drug. Compared with kids whose moms never used marijuana, those whose mothers used the drug within the past year, but fewer than 52 times, were 70% more likely to have started using cannabis. Similarly, kids with dads who used marijuana within the past year, but fewer than 52 times, were 80% more likely to take up cannabis compared to kids whose parents never used the drug.

## 2018

[America’s Invisible Pot Addicts](#) – August 2018. Public-health experts worry about the increasingly potent options available, and the striking number of constant users. Cannabis is not benign, even if it is relatively benign, compared with alcohol, opiates, and cigarettes, among other substances. Thousands of Americans are finding their own use problematic in a climate where pot products are getting more potent, more socially acceptable to use, and yet easier to come by, not that it was particularly hard before.

[Changes in cannabis potency and first-time admissions to drug treatment: A 16-year study in the Netherlands](#) – Psychological Medicine January 2018. Since 2000, cannabis has become the primary illicit drug responsible for first-time admissions to specialist drug treatment, superseding opiates and cocaine. These trends have been evident in several countries including the Netherlands, but also across Europe as a whole. A recent analysis of data submitted to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) found evidence for increasing cannabis admissions across 16 of the 22 countries examined. The authors speculated that these changes could be due to several factors, including an increase in cannabis use, cannabis potency and changes in drug treatment services.

[Higher average potency across the United States is associated with progression to first cannabis use disorder symptom](#) – December 2018. This study provides prospective evidence suggesting higher potency cannabis, on average in the U.S., increases risk for onset of first cannabis use disorder symptom. Development of guidelines regarding cannabis potency is critical for reducing the costs associated with negative health outcomes.

[Marijuana: Facts Parents Need to Know](#) – July 2018. Marijuana refers to the dried leaves, flowers, stems, and seeds from the Cannabis Sativa or Cannabis Indica plant. The terms cannabis and marijuana are often used interchangeably. Extracts from the plant can be made into hash oil or wax. Cannabis products contain the mind-altering chemical delta-9-tetrahydrocannabinol (THC). They can also contain more than 400 other chemicals.

[What to call the plant, the paraphernalia, and the products \(without sounding like an old hippie\)](#) – November 2018. The culture that has grown around the cannabis community continues to develop and evolve with new trends, technologies, nomenclatures, and neologisms. Terms for just the Marijuana plant have at least 10 different names currently trending in this decade.

## 2017 and later

[Marijuana as Medicine? The Science Beyond the Controversy](#) – 2001 National Academy of Sciences. Some clinical studies not only have failed to demonstrate that THC relieves pain but have also found that the drug has the opposite effect. In these experiments, volunteers who experienced painful shocks, heat, or pressure from a tourniquet reported that THC actually increased their sensitivity to pain.

[Patterns of Cannabis Use During Adolescence and Their Association with Harmful Substance Use Behaviour: Findings from a UK Birth Cohort](#) – Oct. 2016. Cannabis and tobacco are highly correlated, and it is difficult to distinguish their separate effects. Furthermore, the gateway hypothesis suggests a sequence to the use of various drugs, as such there is no single 'gateway' drug, and one might expect tobacco and alcohol to predict later cannabis use and other illicit drug use. Adolescent substance use also clusters with other risk behaviours which are strongly associated with outcomes in adulthood.

[Relief-Oriented Use of Marijuana by Teens](#) – April 2009. Teens involved in regular and long-term use of marijuana for relief constructed their use of marijuana as essential to feeling better or "normal" in situations where they perceived there were few other options available to them. Of key importance in the findings are the unmet health needs of these youth. Health issues such as depression, insomnia, and anxiety were significant problems that interfered with these youths' ability to function at school, maintain relationships with family and friends, and feel that they could live a normal life.

[The Facts About Marijuana Concentrates](#) – NIDA 2017. A marijuana concentrate is a highly potent THC- (Tetrahydrocannabinol) concentrated mass that looks like honey or butter. For that reason, it's often called "honey oil" or "budder" on the street. Marijuana concentrates contain extraordinarily high THC levels ranging from 40 to 80 percent THC amounts. This form of marijuana can be up to four times stronger in THC content than high grade or top shelf marijuana, which normally measures around 20 percent THC levels.

[Video: Introduction to Butane Hash Oil](#) – 2013. Simply put, BHO is made by blasting marijuana with butane, a solvent that takes all the THC with it and nothing else. Evaporating away the butane leaves only the resin, a viscous, amber-colored, waxy substance. BHO is vaporized, either in a pan or using a dabbing pipe, which is where the phrase "Dabbing Err!" comes from—you blowtorch the titanium bowl piece until it's red hot, then you use a pointy tool to press the oil onto the metal and it bursts into a vapor cloud that you inhale rapidly.



[Video: What Commercialization is Doing to Cannabis](#) – November 2017. In 2012, Colorado legalized cannabis and added to what has fast become a multibillion-dollar global industry for all things weed-related: from vape pens to brownies and beyond. But to say that we've legalized marijuana is subtly misleading — what we've really done is commercialized THC, says educator Ben Cort, and that's led to products that are unnaturally potent. In an eye-opening talk, Cort examines the often-unseen impacts of the commercial cannabis industry — and calls on us to question those who are getting rich off of it.

[What Is “Dabbing” and Why Parents Need to Worry](#) – October 2014. Dabbing” is a way to get the quickest, long-lasting high with a single inhale. In fact, a single puff from a pipe or vaping pen can give the effect of smoking many joints. Unfortunately for parents, the new vaping pens make it extremely difficult to see, smell or detect.