CALIFORNIA MEDICAL ASSOCIATION

Cannabis Regulation and Physicians

Regulating cannabis, both medical and recreational use, has been a priority area for state and federal policymakers for many years. This report presents the California Medical Association's (CMA) policy development and advocacy efforts related to cannabis and the position statement adopted by the 2019 CMA House of Delegates.

BACKGROUND

Cannabis is the most commonly used illicit drug in the United States.[i] Parts of the *Cannabis sativa* plant have been controlled under the Controlled Substances Act (CSA) since 1970 under the drug class "Marihuana" (commonly referred to as "marijuana") [21 U.S.C. 802(16)]. "Marijuana" is a slang term for the dried leaves and flowers of the varieties of the cannabis plant that are rich in delta-9-tetrahydrocannabinol (THC). Cannabis is the scientific name for marijuana, and for purposes of this report, "medical cannabis" will be used to refer to cannabis that is either recommended by a physician or initiated by a patient to treat a medical condition (except where the term "marijuana" is contained in a direct quotation or referring to an official title). The term "recreational cannabis" will refer to those using it for a pleasurable effect or "high," also often referenced as "adult use of cannabis" in California.

Cannabis sativa, also known as hemp, is a species of the *Cannabinaceae* family of plants and contains more than eighty biologically active chemical compounds. The most commonly known compounds are delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). Both THC and CBD are Schedule I drugs but are entirely distinct cannabinoids that have different pharmacologic properties and physiological effects:[ii]

- THC is the most common cannabinoid found in cannabis and is associated with the psychoactive and euphoric effects of cannabis, owing to its ability to act as a partial agonist for type-1 cannabinoid (CB1) receptors.
- CBD is the second most common cannabinoid found in cannabis; unlike THC, CBD is non-psychoactive and has no abuse potential.
- Hemp is cannabis that contains a very low concentration of THC (0.3 percent or less). Plants that contain more than 0.3 percent THC are considered cannabis. Industrial hemp is hemp that is high in fiber grown for industrial purposes, such as to make rope, textiles, paper, and many other products. Hemp seeds (and the oil from the seeds) are used as a food source.

CANNABIS POTENCY AND METHOD OF USE. From 1995 to 2012, average THC levels in cannabis rose from 4 percent to 12 percent - an increase of nearly 200 percent.[iii] These products may also contain residual amounts of solvents (i.e., butane, hexane), often used to make concentrates, which are potentially toxic. To

date, little attention has focused on the impact of higher THC-containing products on cognitive performance or measures of brain structure and function in humans. This raises concern that adverse consequences associated with cannabis use may be worse now than in the past, particularly among young users. Recently, the U.S. Surgeon General Jerome Adams, M.D., warned that new strains of cannabis are more dangerous than those developed a decade ago, with concentrates delivering significantly higher levels of THC.[iv]

The type of cannabis and the route of administration can affect the onset, intensity and duration of the psychotropic effects, effects on the organ systems, and the addictive potential and negative consequences associated with its use.[v] The dried leaves and flowers (buds) of the cannabis plant may be smoked, vaporized, dabbed or consumed as edible products (e.g., cookies, brownies, gummies, etc.). Vaping produces a similar effect to that of combustible smoking,[vi] while "dabbing" is a term used for flash-vaporizing concentrated hash oil, but offers a different and stronger intoxicating effect.[vii] In contrast, consumption of edibles may not produce effects for 30 minutes to 2 hours and the perceived high may last anywhere from 5 to 8 hours or more. Given the delayed and variable onset associated with edibles, users may misperceive the initial dose as having not produced the desired effect, and may consume an excessive amount.[viii]

CANNABIS AND CANNABIS-DERIVED PRODUCTS. There is significant interest in cannabis and cannabis-derived compounds, particularly CBD, as the proliferation of these products have increased over the last several years. Cannabis-derived products are consumed for both medical and recreational purposes in a variety of methods.

The Agriculture Improvement Act of 2018 was signed into law on December 20, 2018, and removed hemp from the Controlled Substances Act. Under this law, cannabis plants and derivatives that contain no more than 0.3 percent THC on a dry weight basis are no longer controlled substances under federal law. However, the 2018 Farm Bill explicitly preserved the Food and Drug Administration's (FDA) authority to regulate products containing cannabis or cannabis-derived compounds under the Federal Food, Drug, and Cosmetic Act and section 351 of the Public Health Service Act.[ix]

FDA treats products containing cannabis or cannabis-derived compounds as any other FDA-regulated products, and are subject to the same authorities and requirements as FDA-regulated products containing any other substance. This is true regardless of whether the cannabis or cannabis-derived compounds are classified as hemp under the 2018 Farm Bill. Notably, any cannabis product (hemp-derived or otherwise) that is marketed with a claim of therapeutic benefit has to be approved by the FDA for its intended use before it may be introduced into interstate commerce. This includes those products claiming to contain CBD or other cannabis-derived compounds.

CANNABINOID-BASED MEDICATIONS. To date, the FDA has not approved a marketing application for cannabis for the treatment of any disease or condition. Other than one prescription human drug product to treat rare, severe forms of epilepsy, the FDA has not approved any other CBD products, and there is very

limited information for other marketed CBD products. Unlike drugs approved by the FDA, the manufacturing process of these products has not been subject to FDA review as part of the drug approval process, and there has been no evaluation regarding drug effectiveness, what the proper dosage is, how they could interact with FDA-approved drugs, or whether they have dangerous side effects or other safety concerns.

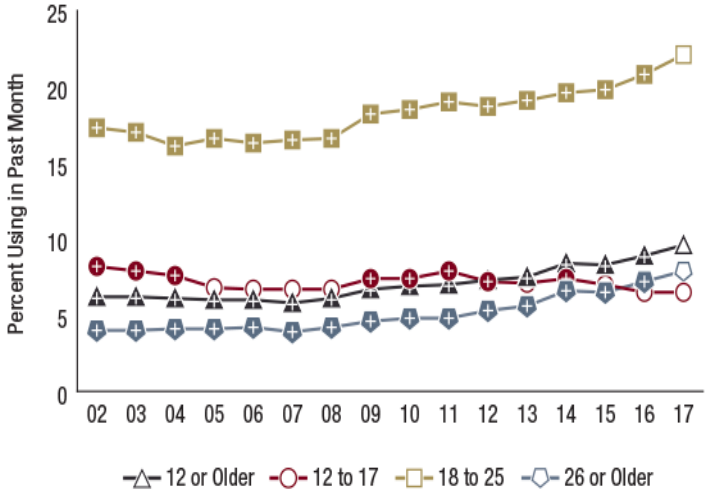
The FDA has approved one cannabis-derived and three cannabis-related drug products, meaning they are safe and effective for its intended use. This includes Epidiolex, which contains a purified form of the drug substance CBD for the treatment of seizures associated with Lennox-Gastaut syndrome or Dravet syndrome in patients two years of age and older. The agency also has approved Marinol and Syndros for therapeutic uses in the United States, including for the treatment of anorexia associated with weight loss in AIDS patients. Marinol and Syndros include the active ingredient dronabinol, a synthetic delta-9-tetrahydrocannabinol (THC) which is considered the psychoactive component of cannabis. Another FDA-approved drug, Cesamet, contains the active ingredient nabilone, which has a chemical structure similar to THC and is synthetically derived. In California, these FDA-approved products are available with a prescription from a duly DEA-authorized and licensed prescriber (e.g., physician, physician assistant, nurse practitioner, etc.).

Cannabis: Prevalence of Use, Perception of Harm and Sales Trends

CANNABIS USE PREVALENCE AND PERCEPTION OF HARM. Cannabis use has risen and fallen over the last century, but it still remains the most popular illicit drug today in the United States.[x] Research shows that the primary use of cannabis in the U.S. is recreational use, with 89.5 percent of adult cannabis users, and only 10.5 percent reporting use solely for medical purposes (36.1 percent reported dual use of medical/recreational).[xi] Further, cannabis use among youth was higher in states that have legalized non-medical cannabis, regardless of how long the policy had been implemented or whether markets had been established.[xii]

In 2017, an estimated 26.0 million Americans aged 12 or older reported as current users of cannabis. (Figure 13, SAMHSA). The number of past month cannabis users corresponds to 9.6 percent of the population aged 12 or older. Cannabis use is most prevalent among young people ages 18 to 25 (22.1 percent are current users), while 12 to 17 year olds usually have the lowest prevalence rate (6.5 percent are current users). Nationally, the percentage of people aged 12 or older who were current cannabis users in 2017 was higher than the percentages from 2002 to 2016, but this reflects increases in cannabis use among both young adults aged 18 to 25 and adults aged 26 or older. The percentage of 12 to 17 year-olds in 2017 who were current cannabis users was lower than the percentages in most years from 2009 to 2014, but it was similar to the percentages in 2015 and 2016.[xiii]

Figure 13. Past Month Marijuana Use among People Aged 12 or Older, by Age Group: Percentages, 2002-2017



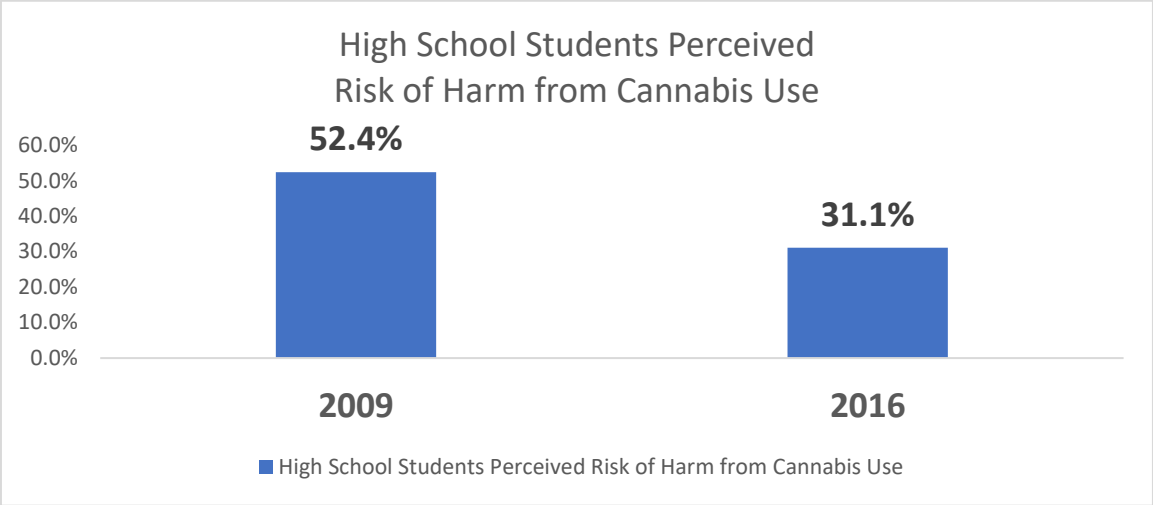
D

[+] Difference between this estimate and the 2017 estimate is statistically significant at the .05 level.

The perceived risk of harm associated with cannabis use is decreasing. A significant negative relationship has been found between cannabis use and perceived great risk of use at the sub state level across the United States; for example, sub state regions with higher percentages of cannabis use were more likely to have lower percentages of the population who think there is great risk in using cannabis.[xiv] Nationally, in 2016, only 31.1 percent of high school seniors thought regular cannabis use was harmful; in 2009 the rate was 52.4 percent (see chart). Despite the decreases in perceived risk, a 2018 Monitoring the Future study did not find a concomitant rise in overall use.[xv]

However, the same study included the first ever national questions about vaping of cannabis in the past 30 days, in the past 12 months, and in the student's lifetime. One in ten 12th grade students reported vaping in the past 12 months, and the prevalence was 3 percent, 8 percent, and 10 percent for 8th, 10th, and 12th grade students, respectively. In each grade, more than one quarter of students who had used cannabis had experience vaping it. These levels are quite high considering that vaping was relatively unknown among adolescents just five years earlier.

In 2018, annual prevalence rose substantially and significantly to 4 percent, 12 percent, and 13 percent in the three grades.[xvi] California survey estimates provide another indicator regarding adolescent use of electronic smoking devices to vape cannabis - in 2016, of California high school students who reported ever having used electronic cigarettes, or vaping, 27.1 percent reported having used cannabis or hash oil in them.[xvii]



In addition to prevalence and routes of administration, measuring the volume and intensity of use can also paint a picture in terms of changing use habits. As a proportion of past-month users, heavy users have grown from roughly one in nine in 1992 to more than one in three in 2014, indicating an increased intensity of use among current users. Additionally, the population of heavy users has not only become larger, but it has also become older as well: 26 to 34 year olds report less past-month use than 18 to 25 year olds, but they report substantially more heavy use among current users (42.2 percent). Heavy use among past-month users is lowest among 12 to 17 year olds, who tend to have lighter habits.[xviii]

CANNABIS-PRODUCT SALES TRENDS. The use of cannabis concentrates have become increasingly popular, with concentrated products all having significantly higher potency relative to traditional, whole flower products – often exceeding levels of 60 percent of THC. The oil (butane honey oil, shatter, wax, crumble) is extracted from plant material using organic solvents, such as ethanol, hexane, butane or supercritical CO_2, and can either be smoked or vaporized by pressing the extracted oil against the heated surface of an oil rig pipe. Other methods of use or consumption of cannabis include pills, tinctures, sprays, oils for cooking, creams, ointments, eye drops, and suppositories.[xix]

While whole cannabis flowers have historically been the most popular in terms of sales, other cannabis products and methods of consumption have experienced rapid growth in states that have legalized medical and recreational use (noting that given its illegal federal status, data on product sales is variable and difficult to track comprehensively). In California, the last several months of 2018 saw cannabis concentrate sales outpace whole flower sales, with vapes being the most popular concentrate. Vape sales grew 69 percent in California according to data from BDA Analytics. In particular, CBD vape sales are projected to grow into 2019 and beyond.[xx]

Additionally, cannabis edibles, such as gummies, are an increasingly popular product and method of ingestion. Specifically, edible sales reached over $1 billion in 2018 alone, and a market analysis predicts it to be worth $4.1 billion by 2022.[xxi] Tinctures are among the most popular CBD cannabis products due to their versatility. A classification under CBD oil, CBD tinctures can be added to food or drink or taken by themselves, which drove sales of CBD tinctures up 111.5 percent between Q1 of 2017 and Q1 of 2018. With the passage of the Farm Bill, extracting CBD from hemp is federally legal, and overall, the CBD market is projected to be worth $22 billion by 2022, according to market analysis by the Brightfield Group.[xxii]

Cannabis: Regulation and Legal Status

Cannabis is regulated by local, state, federal and international law. State laws have historically mirrored federal law, placing cannabis in Schedule I status, the most restrictive category reserved for substances with no accepted medical use. However, the overall landscape continues to evolve as thirty-three states and the District of Columbia have passed laws broadly legalizing cannabis in some form, including California.[xxiii] Despite movement at the state level, federal law remains an important factor in the regulation of cannabis, particularly as research is concerned.

FEDERAL REGULATION OF CANNABIS. Under the federal Controlled Substances Act, knowingly or intentionally manufacturing, distributing, dispensing, or possessing a Schedule I controlled substance is a criminal offense. In addition, a person who aids and abets another in violating federal law, or engages in a conspiracy to purchase, cultivate, or possess cannabis can be punished to the same extent as the individual who actually commits the crime.

The federal government has historically relied on state and local authorities to enforce criminal prohibitions on cannabis retail and use. The U.S. Department of Justice (DOJ), under the Obama Administration, issued a series of memos that describe the DOJ's enforcement position with regard to medical and recreational use of cannabis in states that permit the use of cannabis. These memos reflect the DOJ's position to allow states to implement laws establishing state-regulated production, distribution, and use of cannabis so long as states implement strong and effective regulatory and enforcement systems to mitigate threats to federal enforcement interests.

Note, however, that given the transition to the Trump Administration, the DOJ's guidance on enforcement continues to shift: on January 4, 2018, the DOJ under former Attorney General Jeff Sessions rescinded all three memos on federal marijuana enforcement policy and announced, "a return to the rule of law."[xxiv] The DOJ directed federal prosecutors to "enforce the laws enacted by Congress and follow well-established

principles when pursuing prosecutions related to marijuana activities." However, to date, CMA is unaware of any large-scale changes in the enforcement of state medical cannabis laws.

ROHRABACHER-FARR AMENDMENT. In 2015, §538 of the federal budget bill, known as the Rohrabacher-Farr Amendment of the Consolidated and Further Continuing Appropriations Act of 2015 (Pub.L.No. 113-235), provided that no funding allocated to the DOJ can be used to prevent states from implementing their law related to medical cannabis. In a February 27, 2015 memo, the DOJ narrowly interpreted §538 stating that it only prevents the DOJ from impeding the ability of states to carry out their medical cannabis laws. The memo explained that §538 does not bar the use of funds to enforce criminal prohibitions under the Controlled Substances Act or to take civil enforcement and forfeiture actions against private individuals or entities consistent with the Ogden and Cole memos.[xxv] As of December 2018, the Rohrabacher-Blumenauer Amendment (formerly known as Rohrabacher-Farr Amendment) was renewed. However, the most recent extension is only effective through September 30, 2019.

While the federal government has historically funded limited studies into cannabis and its components, researchers have struggled to overcome barriers to research that exist for federally banned substances. As more states have legalized cannabis, though, agencies like the National Center for Complementary and Integrative Health (NCCIH) have started ramping up their calls for research. In fiscal year 2017, the National Institutes of Health supported 330 projects totaling almost $140 million on cannabinoid research. Within this investment, 70 projects ($36 million) examined therapeutic properties of cannabinoids, and 26 projects ($15 million) focused on CBD.[xxvi] Despite this, due to its Schedule I status, the federal government has restricted research on cannabis by licensing only a single producer of cannabis that is under contract with the National Institute on Drug Abuse and requiring multiple administrative reviews on research proposals (see discussion section on research).[xxvii]

Federal banking and commercial laws have also hindered the development of commercial cannabis businesses, which prevents businesses from accessing the banking sector, accessing lines of credit, checking accounts, and other tax implications. For example, cannabis businesses are not allowed to take tax deductions on normal business expenses like employee salaries, rent and utility bills because the federal government considers their trade illegal drug trafficking -- even where cannabis sales are legal under state law.[xxviii]

CALIFORNIA REGULATION OF CANNABIS. Although medical cannabis has been legal in California since 1996, the state has undergone a major overhaul of its laws and regulations in creating a single regulatory system to govern cannabis in California.

In 1996, California voters passed Proposition 215, which decriminalized the cultivation and use of cannabis by seriously ill individuals upon a physician's recommendation (Health & Safety Code §11362.5).

Proposition 215 enacted the Compassionate Use Act of 1996 to "ensure that seriously ill Californians have the right to obtain and use marijuana [cannabis] for medical purposes where that medical use is deemed appropriate and has been recommended by a physician who has determined that the person's health would benefit from the use of cannabis.

In 2003, the California Legislature enacted the Medical Marijuana Program (MMP)[xxix] to promote the uniform and consistent application of the Compassionate Use Act. In 2015, the Medical Cannabis Regulation and Safety Act[xxx] (MCRSA) was enacted to establish a comprehensive regulatory framework for commercial medical cannabis. This regulatory framework was expanded to include recreational cannabis following the passage of Proposition 64 or "The Control, Regulate and Tax Adult Use of Marijuana Act" or "AUMA," in 2016 which legalized recreational use of cannabis by adults twenty-one (21) and older.[xxxi] CMA supported AUMA, also known as Proposition 64, which effectively became the starting point for regulating recreational cannabis in this manner.

Under AUMA, adults, defined as 21 years of age and older, are allowed to possess, process, transport, purchase, obtain, or give away to adults for free, and use up to 28.5 grams of recreational cannabis, and up to 8 grams of concentrated cannabis. AUMA only allows cannabis to be smoked or ingested in a private home or at a business licensed for on-site cannabis consumption. The law states that it does not permit individuals to smoke or ingest cannabis or cannabis products in any public place, use while operating or riding in a vehicle, or otherwise smoke cannabis in a location where smoking tobacco is prohibited. AUMA also prohibits the possession of cannabis on the grounds of schools, day care centers, or youth center while children are present. It also prohibits growing cannabis in an area that is unlocked or visible from a public place.

In addition, AUMA requires:

- Testing for contaminants, including residual solvents, processing chemicals, foreign material, and microbiological impurities;
- Packaging that is child resistant and not made to be attractive to children;
- Labeling that includes a government health warning, and list of pharmacologically active ingredients and potency;
- Designs that are not appealing to children or easily confused with commercially sold candy or foods that do not contain cannabis;
- Advertising prohibitions on specific approaches that may appeal to those under 21, and restricts health-related statements; and,
- Allows local jurisdictions to regulate and/or ban recreational cannabis businesses.

Despite the AUMA's attempt to devise a comprehensive commercial regulatory structure from scratch, it was recognized as one step in an iterative process that requires ongoing refinement and input from stakeholders. AUMA also included a CMA-supported provision to allow changes by a majority vote of the Legislature, which was aimed to help California refine the rules over time.

Commercial cannabis licensing in California began on January 1, 2018, with temporary licenses granted as medical and recreational cannabis was aligned into one regulatory system. Effective January 16, 2019, state regulations concerning all cannabis businesses were approved and took effect immediately, supplanting previous emergency regulations. The Bureau of Cannabis Control is the lead agency in regulating commercial cannabis licenses for medical and recreational cannabis in California, and is responsible for licensing retailers, distributors, testing labs, microbusinesses, and temporary cannabis events. Cal-Cannabis Cultivation Licensing, a division of the California Department of Food and Agriculture, ensures public safety and environmental protection by licensing and regulating commercial cannabis cultivators in California. The Manufactured Cannabis Safety Branch, a division of the California Department of Public Health, is responsible for regulation of all commercial cannabis manufacturing in California. The Manufactured Cannabis Safety Branch strives to protect public health and safety by ensuring commercial cannabis manufacturers operate safe, sanitary workplaces, and follow good manufacturing practices to produce products that are free of contaminants, meet product guidelines and are properly packaged and labeled.

One of the more controversial regulations affecting local agencies is California Code of Regulations section 5416(d), which provides that deliveries may be made to "any jurisdiction within the State of California." This regulation applies even if a local jurisdiction prohibits cannabis deliveries in its community.

In addition to authorizing the delivery of cannabis, the state regulations also:

- Prohibit the use of certain advertisement techniques that may be attractive to minors and prohibits the advertisement of free cannabis goods or giveaways of any type of product;
- Strictly control the handling of cannabis waste;
- Impose stricter enforcement of temporary cannabis events;
- Give priority to applicants for state licenses who can demonstrate that their commercial cannabis business was in operation under the Compassionate Use Act of 1996, as of Sept. 1, 2016;
- Update manufacturing processes and procedures;
- Update cannabis labeling requirements for all cannabis products, including required government warnings; and,
- Set allowable THC concentration limits for edible cannabis products - single-serving edibles products cannot exceed 10 milligrams of THC and packages of edibles could not exceed 100 milligrams of THC. (16 C.C.R. §§5000 *et seq.*).

TAX FUND. The AUMA taxes recreational cannabis and recreational cannabis products at a 15% excise tax, to be imposed upon the purchaser. This is in addition to any sales and use tax imposed by the state and local governments. Effective November 9, 2016, medical cannabis is exempt from the excise tax if the purchaser has a government-issued medical cannabis card indicating that they are a qualified patient or primary caregiver consistent with current law. A cultivation tax is imposed on all marijuana that enters the commercial market, including medical cannabis, at a rate of $9.25 per dry weight ounce of flowers and $2.75 per dry-weight ounce of leaves.

A tax fund created the following allocations:

Allocations	Annual Funding	Duration
Community reinvestment grants to local health departments and nonprofit organizations to support a variety of purposes	$10 million for 5 years, then $50 million thereafter	2018-19 and ongoing
Research and evaluation of the implementation and effect of AUMA	$10 million	2018-19 through 2028-29
Establish and adopt protocols related to impaired driving	$3 million	2018-19 through 2022-23
Medical research on marijuana	$2 million	2017-18 and ongoing

Following those allocations, all remaining revenues are to be apportioned as follows:

- 60% for youth programs targeted at education and prevention;
- 20% to clean up and prevent environmental harm from illegal marijuana activities; and
- 20% for (1) programs designed to reduce driving under the influence of alcohol, marijuana and other drugs; and, (2) a grant program designed to reduce potential negative impacts on public health or safety as a result of AUMA.

As it pertains to the 60 percent amount, the AUMA specifies that it shall go to a Youth Education, Prevention, Early Intervention and Treatment Account, and it will be disbursed by the California Department of Health Care Services (DHCS) for programs designed to educate youth about and to prevent substance use disorders, and to prevent harm from substance use. DHCS shall enter into agreements with the California Department of Public Health and the California Department of Education to implement and administer these programs.

MEDICAL CANNABIS IN CALIFORNIA. The Compassionate Use Act (CUA) applied to patients with cancer, anorexia, AIDS, chronic pain, spasticity, glaucoma, arthritis, and migraine. In addition, it applies to

"any other illness for which marijuana provides relief." The MMP clarified the concept of a "serious medical condition," which can qualify a patient to obtain an ID card and use medical cannabis upon a physician's recommendation: AIDS, anorexia, arthritis, cachexia, cancer, chronic pain, glaucoma, migraine, persistent muscle spasms (including those associated with multiple sclerosis), seizures (including those associated with epilepsy), and severe nausea. Further, the concept includes any other chronic or persistent medical symptom that either:

- Substantially limits the ability of the person to conduct one or more major life activities as defined in the ADA; or
- If not alleviated, may cause serious harm to the patient's safety or physical or mental health. (Health & Safety Code §11362.7(h).)

The language of the CUA provides that physicians cannot be "punished or denied any right or privilege" for having recommended cannabis to a patient for medical purposes. Therefore, it should be impermissible for a state governmental entity to punish a physician either criminally or civilly under state law, or to subject the physician to loss of license or other administrative sanction, solely on the basis of having made an oral or written recommendation for the medical use of cannabis (at least for a serious medical condition).

A physician's discussion and, if appropriate, recommendation, of the use of medical cannabis, in

accordance with standard physician practices, does not, in the absence of other factors, violate either

state law or the professional standard of practice. For a more thorough discussion of the laws surrounding medical cannabis, refer to CMA Health Law Library document #3209, "Medical Cannabis." [xxxii]

The MBC assures physicians, who recommend the use of medical cannabis to their patients as part of their regular practice, that they will not be subject to investigation or disciplinary action if they arrived at that decision in accordance with accepted standards of medical responsibility. In April 2018, the MBC updated their 2004 informational statement and released Guidelines for the Recommendation of Cannabis for Medical Purposes (MBC Cannabis Guidelines). The MBC Cannabis Guidelines are available at **www.mbc.ca.gov/Publications/guidelines_cannabis_recommendation.pdf**.

Regardless of state law, due to its federal Schedule I status, physicians who are found to be aiding and abetting another in violation of the Controlled Substances Act can be subject to federal prosecution, revocation of DEA registration, and exclusion from public program such as Medicare and Medi-Cal.

In addition, due to the historical absence of a robust regulatory structure in California regarding the manufacturing and distribution of cannabis, there is a lack of information regarding the type of cannabis a patient may be using and any potential drug interactions.

Cannabis: Summary of Health Effects

In January 2017, the National Academies of Sciences, Engineering, and Medicine (NASEM) published a comprehensive report entitled "The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and the Recommendations for Research." The report's recommendations outline priorities for a research agenda and highlight the potential for improvements in data collection efforts and enhanced surveillance capacity. The report also contained 98 conclusions based on the accumulated evidence related to cannabis or cannabinoid use and health.

THERAPEUTIC EFFECTS. The report examined a broad range of possible health effects of cannabis and cannabinoids. The findings are organized into five evidence categories: conclusive, substantial, moderate, limited, and no/insufficient evidence.

The report found conclusive evidence of modest therapeutic efficacy for cannabis, cannabis-based products, or synthetic cannabinoids for three conditions:

- Cancer patients experiencing chemotherapy-induced nausea and vomiting;
- Chronic pain1; and,
- Multiple sclerosis-related spasticity.

For other conditions evaluated, NASEM either found no therapeutic effects or inconclusive evidence of effects. Although there is only conclusive evidence for these three conditions, it is notable that California's Compassionate Use Act of 1996 established the right for patients to obtain and use cannabis when prescribed for "cancer, anorexia, AIDS, chronic pain, spasticity, glaucoma, arthritis, migraine, or any other illness for which [cannabis] may provide relief." In terms of adverse effects of recreational cannabis use, NASEM found substantial, but not conclusive, evidence for:

- Worsening respiratory symptoms and more frequent chronic bronchitis episode associated with long-term cannabis smoking;
- Increased the risk of motor vehicle accidents associated with cannabis use;
- Unintentional cannabis overdose injuries in children;
- Lower birthweight of children with maternal cannabis smoking; and,
- Development of psychoses associated with frequent cannabis use.

[1] "Chronic pain" is the term as referenced in the NASEM report; as noted in the "Pain Management and Opioids" section, most studies of the efficacy of cannabinoids on pain are for neuropathic pain.

PAIN MANAGEMENT AND OPIOIDS. While the NASEM report found the use of cannabis for the treatment of pain to be supported by well-controlled clinical trials, they acknowledged many of the cannabis products used for federally-approved research largely differs from the cannabis products sold in state-based dispensaries. As a result, very little is known about the efficacy, dose, routes of administration, or side effects of commonly used and commercially available cannabis products in the United States. Further, recent systematic reviews identified limited to moderate evidence that cannabis alleviates neuropathic pain and insufficient evidence for other types of pain.[xxxiii,xxxiv,xxxv] When taken together, there is inconclusive evidence that cannabinoids effectively manage chronic pain, and large numbers of patients must receive treatment with cannabinoids for a few to benefit, while not many need to receive treatment to result in harm.[xxxvi]

No randomized clinical trials have been performed to study the effect of substituting cannabis for opioids in patients taking or misusing opioids to relieve pain. Other studies linking cannabis with fewer opioid overdoses are limited in their methodology and causation cannot be inferred. The largest prospective study on cannabis as a substitute for opioids associated cannabis use with more subsequent pain, less self-efficacy for managing pain, and no reductions in prescribed opioid use.[xxxvii,xxxviii] New research even suggests adults who combine prescription opioids for severe pain and cannabis report elevated anxiety and depression symptoms, with no increased pain reduction.[xxxix] There is sufficient and expanding evidence indicating that cannabis use will not curb the opioid crisis.[xl]

Despite this, several states are easing policy restrictions on cannabis use without the benefit of appropriate research. Colorado became the third state (following New York and Illinois) to allow physicians to recommend cannabis for any condition for which they would prescribe an opioid.

CANNABIS USE DISORDER. In recent years, cannabis use disorder (CUD) has been termed an official psychiatric disorder via the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) and it replaces the previous diagnoses of cannabis abuse and cannabis dependence. CUD is a diagnosable psychiatric disorder defined as a problematic pattern of cannabis use leading to clinically significant personal, social, physical, and/or psychological distress or impairment.xli,xlii Although some progress has been made in standardizing terminology, explicit characterizations of cannabis use patterns that precede abuse or dependence still remain unclear. A major contributor to this issue is the lack of official distinction between “risky” or “problem” use of cannabis.[xliii,xliv]

CUD is common in the United States, is often associated with other substance use disorders, behavioral problems, and disability, and goes largely untreated.[xlv] An analysis found that 2.5 percent of adults - nearly 6 million people - experienced CUD in the past year, while 6.3 percent had met the diagnostic criteria for the disorder at some point in their lives.[xlvi] On average, 9 percent of individuals who initiate cannabis use will

develop CUD in their lifetime.[xlvii] Initiating cannabis use at an earlier age and increasing frequency of use are significantly associated with developing CUD.

Treatment for CUD usually occurs on an outpatient basis, but residential treatment may be required for patients who cannot remain abstinent in an ambulatory setting or those with multiple concurrent substance use disorders. Treatment may occur in an inpatient hospital setting if the patient is psychotic, suicidal, severely depressed or agitated, or requires hospitalization because of another concurrent psychiatric disorder.[xlviii] Notwithstanding, the number of publicly-funded treatment admissions for cannabis has declined overall since 2010. According to the 2015 TEDS data, cannabis accounts for 14 percent of publicly-funded treatment admissions in the United States.[xlix] California-specific data indicates that cannabis is the third most prevalent drug reported at time of admission to substance use treatment at 17 percent.[l] These percentages do not include privately-funded treatment.

CANNABINOID HYPEREMESIS SYNDROME (CHS). CHS is associated with chronic cannabis use resulting in cyclical vomiting, sometimes requiring several visits before associating the symptoms with cannabis use. Due to more potent strains of cannabis, CHS is becoming more frequently diagnosed.

SPECIAL POPULATIONS. While more high quality research is needed, there are special-risk populations for which the adverse effects of cannabis are particularly heightened:

- **WOMEN WHO ARE PREGNANT OR BREASTFEEDING.** In its Committee Opinion on Marijuana Use During Pregnancy and Lactation, the American College of Obstetricians and Gynecologists (ACOG) reported that 34% to 60% of cannabis users continued use during pregnancy, with many women believing that it is relatively safe to use during pregnancy.[li] If a woman consumes cannabis while pregnant, she will expose the fetus to THC, the primary psychoactive component in cannabis, through her bloodstream.[lii,liii] A 2016 systematic review and meta-analysis of evidence shows that fetuses exposed to THC are more likely to experience lower birth weight and higher odds of placement in NICU/ICU.[liv] Studies suggest that women who consume cannabis during pregnancy may have a greater risk of anemia.[lv] Acute effects of cannabis consumption include a decrease in blood pressure, which may increase the risk of falls causing injury to both mother and fetus.[lvi] Other findings from two prospective longitudinal cohort studies show that heavy in utero exposure (at least 5 times per week) to THC can negatively effect children's neurocognitive development.[lvii,lviii] Both ACOG and the American Academy of Pediatrics (AAP) have published evidence-based guidelines regarding cannabis use during pregnancy and lactation that may be helpful for clinicians in screening for cannabis use in these populations and engaging in informed discussions with patients.[lix,lx]
- **CHILDREN AND YOUTH.** While it is illegal in California for anyone under 21 years of age to smoke, consume, buy, or possess recreational cannabis, a significant proportion of adolescents report using cannabis. Further, some adolescents and youth may use cannabis for medical purposes. However, cannabis use in adolescence is associated with a number of potential adverse outcomes. In particular, the human brain continues to develop until the age of 25. Multiple sources have established that regular cannabis use during adolescence and early adulthood can cause functional and structural changes to the brain, impairing its development.[lxi] Still other harmful outcomes may present into adulthood (e.g.,

adverse social behaviors,[lxii] decreased neuropsychological and cognitive function,[lxiii] and increased risk for depression, anxiety, and suicidality[lxiv]). Moreover, during adolescence, cannabis is associated with increased psychiatric emergency department visits[lxv,lxvi] and increased risk for psychosis.[lxvii]

While California data is still in its infancy as the legal cannabis market develops, we can look to lessons from other states to provide perspective.

In 2013, Colorado became one of the first states to legalize the retail sale and possession of recreational cannabis for adults over age 21. Last year, the Colorado Division of Criminal Justice Office of Research and Statistics released "Impacts on Marijuana Legalization in Colorado," a report that compiles and analyzes data on cannabis-related topics including crime, impaired driving, hospitalizations and ER visits, usage rates, effects on youth, and more. Some of the findings include:

- **EDUCATION AND YOUTH USE:** Colorado has not experienced an increase in cannabis use among young people, although it was the single most common reason for school expulsions in the 2016 - 2017 school year, the first year it was broken out as its own category. Cannabis also has not impacted graduation rates or dropout rates in Colorado. Graduation rates have increased while dropout rates have decreased since 2012.
- **DRIVING:** The number of drivers in fatal crashes who tested above the legal limit of THC decreased to 35 in 2017, down from 52 in 2016. The number of citations for marijuana-only impairment stayed steady between 2014 to 2017 at around 7 percent of all DUI arrests. That's roughly 350 citations out of nearly 5,000 DUI arrests each year, the report said.
- **ARRESTS:** Total cannabis arrests dropped by half during a five-year period, decreasing to 6,153 in 2017 from 12,709 in 2012. Cannabis possession arrests - the majority of all cannabis-related arrests - were cut by more than half during the same period, dropping to 5,154 from 11,361.
- **CRIME:** Cannabis grown illegally on public lands — an indicator for the size of the black market —is on the rise with 80,926 plants seized in 2017, a 73 percent increase in five years. Organized crime cases almost tripled in five years, increasing to 119 in 2017 from 31 in 2012.
- **HEALTH:** Rates of hospitalization with possible cannabis exposures increased steadily from 2000 through 2015. The number of adults who use cannabis increased between 2014 and 2017, with men getting high more often than women and young adults ages 18 to 25 the most frequent users.[lxviii]

POLICY DISCUSSION

Prior to adoption of the 2019 position statement, CMA had adopted extensive policies concerning cannabis regulation in October 2011, when CMA adopted a position on cannabis legalization through its white paper "Cannabis and the Regulatory Void."

Policy recommendations included:

- "Reschedule" medical cannabis in order to encourage research lending to responsible regulation;
- Regulate recreational cannabis in a manner similar to alcohol and tobacco;
- Tax cannabis; and
- Facilitate dissemination of risks and benefits of cannabis use.

Other relevant policy subsequently adopted includes requiring the dispensing of medical marijuana in childproof containers and the development of strict labeling guidelines and regulations that ensure accuracy in ingredients and potency of all marijuana products sold as medical or recreational products. The same policy urges the implementation of strict marketing and advertising standards. CMA also supports a tightly restricted regulatory system that will reduce the negative impacts associated with cannabis legalization, particularly among the youth and adolescent population.

Given CMA's policy in the area, the only cannabis legislation CMA took a position on in 2019 was AB 420 which sought to ensure the research of cannabis by authorizing the University of California to cultivate cannabis and establish the California Cannabis Research Program.

"Cannabis and the Regulatory Void"

In October 2011, CMA adopted a position on cannabis legalization when the Board of Trustees unanimously adopted the white paper "Cannabis and the Regulatory Void." The CMA Legalization and Taxation of Marijuana Technical Advisory Committee (TAC) found that the public movement toward legalization of medical cannabis has inappropriately placed physicians in the role of gatekeeper for public access to this botanical. The TAC found that effective regulation is possible only if cannabis is rescheduled at the federal level.

"Cannabis and the Regulatory Void" was the first ever declaration by a state medical association that essentially supported the legalization of recreational cannabis as policy approach to regulating the product. This report evaluates each of the policy recommendations from the 2011 white paper to assess if the objective has been met, the opportunities available in our current landscape to strengthen the policy and/or meet expectations, and if any of the recommendations should be modified given the sweeping changes that have been made to cannabis policy since this document was produced.

"RESCHEDULE" MEDICAL CANNABIS TO ENCOURAGE RESEARCH LENDING TO RESPONSIBLE REGULATION. Research surrounding cannabis that meets modern scientific standards has remained limited due to cannabis' status as a federally restricted Schedule I substance. Since adoption of CMA's 2011 document, not much has changed to facilitate a robust research agenda and many of the existing barriers to well-controlled clinical trials remain. Despite the changes in state policy towards legalization, and the increasing prevalence of cannabis use and its implications for public health, the federal government

continues to enforce restrictive policies and regulations on research into the health implications of cannabis products. Particularly as these cannabis products evolve, as do use patterns and trends, the need for evidence-based information on the health effects of cannabis and cannabinoids remains a priority.

The 2017 NASEM report identified several barriers to conducting basic, clinical and population-level health research on cannabis and cannabinoids. Researchers seeking to obtain cannabis or cannabinoids must navigate a series of review processes that may involve the National Institute of Drug Abuse (NIDA), the FDA, the U.S. Drug Enforcement Administration (DEA), institutional review boards, offices or departments in state governments, the researcher's home institution and potential funders.[lxix] The approval process to conduct basic and clinical cannabis research can be overwhelming, time-consuming and has discouraged researchers from pursuing grant funding.[lxx] For example, in addition to the series of federal approvals that a researcher must obtain, California also requires that all trials involving Schedule I or II controlled substances be registered with and approved by the Research Advisory Panel of California.[lxxi]

In addition to regulatory barriers to research, there are also barriers to cannabis supply and funding limitations. For years, the University of Mississippi (pursuant to a contract with NIDA) provided the sole source of research-grade herbal cannabis in the United States. As a result, the varieties of cannabis that have been made available to researchers through NIDA were limited in strain and not of comparable potency to what patients might obtain from a dispensary. Therefore, since the variety of products that are sold to consumers might differ from research-produced cannabis, these federally-approved studies may lack external validity.[lxxii]

In 2015, the DEA approved a significant increase in the amount of cannabis that can be grown at the

University of Mississippi, as a result of the increased research surrounding cannabidiol. Recent projections indicate that the DEA increased its quota for growing cannabis for research purposes by more than five times due to "increased usage projections for federally approved research projects." Additionally, in August 2016, the DEA announced a policy change designed to foster research by expanding the number of DEA-registered cannabis manufacturers and provide researchers with a more varied and robust supply of cannabis. The policy was intended to allow entities to apply to become registered with the DEA so they can grow and distribute cannabis for FDA-authorized research purposes.[lxxiii] Despite this 2016 policy, the DEA has yet to approve any of the over two dozen pending applications to grow cannabis for research purposes.[lxxiv] One of the applicants, the Arizona-based Scottsdale Research Institute, filed a writ in federal court to compel the DEA to move on the applications. The petition described the marijuana received from Mississippi as "sub-par," particularly for clinical trials.[lxxv] At the current writing of the report, as a result of pressure at the federal level, the DEA announced it will issue regulations to expand the quantity and variety of cannabis that it permits for use in officially sanctioned scientific and medical research. After finalizing

the rule, the agency said, it will begin reviewing all of the applications that have been pending to cultivate cannabis.[lxxvi]

There has been some progress to expand research into cannabis's therapeutic effects within California. The Center for Medicinal Cannabis Research (CMCR) at the University of California was created in 2000 to produce clinical and preclinical studies of cannabinoids and its therapeutic potential. More recently, AUMA provided CMCR with $2,000,000 annually, which is utilized for grants to support cannabis-related studies that further enhance the understanding of the efficacy and adverse effects of cannabis and cannabinoids as pharmacological agents for the treatment of medical and psychiatric disorders, and their potential public health impacts.[lxxvii]

Current CMCR studies examine the effects of cannabis on pain, as well as public safety issues surrounding the use of cannabis and cannabinoids. Some of the ongoing studies include the following:

- "*A randomized, controlled trial of Dronabinol and vaporized cannabis in neuropathic low back pain*" is examining whether eight weeks of at-home treatment (oral Dronabinol vs. vaporized cannabis) results in a significant analgesic response, as well as the effects that regular dosing may have on driving performance.
- "A randomized, controlled trial of cannabis in healthy volunteers: Evaluating simulating driving, field performance tests, and cannabinoid levels" was authorized by State of California AB 266 (Bonta) in order to determine the effect that cannabis use has on driving performance, and whether it is possible to develop improved methods (iPad-based cognitive tests, blood/breath/oral fluid) to detect cannabis-impaired drivers.
- "*Effect of cannabis and endocannabinoids on HIV neuropathic pain*" examines the acute effects of cannabis and endocannabinoids on pain, as well as the relationship between dispensary-obtained cannabis and pain changes, using a text-messaging tool.

Proposed legislation would expand the CMCR research program and address some of the cannabis supply issues mentioned above. Assembly Bill 420 (Lackey) authorizes CMCR to cultivate cannabis for its use in research, effectively circumventing several of the limitations by using federally-approved cannabis through the University of Mississippi. The bill also expands the purview of the program's studies to examine the effect of cannabis on motor skills, the health and safety effects of cannabis, cannabinoids, and other behavioral and health outcomes. Importantly, AB 420 also authorizes controlled clinical trials to focus on examining testing methods for detecting harmful contaminants in cannabis, including mold and bacteria.

While these ongoing studies are promising, overall, there have been methodological challenges with clinical trials that are of low methodological quality and lack standardization.[lxxviii] As a result, there still exists a lack of reliable data to properly guide physicians on how to recommend cannabis by product and dosage amount,

and patients may be unaware of potential treatment options. Similar to other drugs that have been studied extensively, rescheduling cannabis from a Schedule I drug would support population-level studies into the health effects of cannabis and a robust cannabis research agenda.

The NASEM report suggests efforts at the federal level to ensure that cannabis research is of high methodological quality by the development of research standards and benchmarks to guide data collection methods, research methods and design, and reporting. Overall, the report recommended prioritizing cannabis research across multiple research groups, including clinical and applied research. Additionally, development of the evidence base must also be supported by strong data collection efforts and improved public health surveillance capacity.[lxxix]

REGULATE RECREATIONAL CANNABIS IN A MANNER SIMILAR TO ALCOHOL AND TOBACCO. The 2011 CMA white paper recognized that there is a need for oversight and quality control with cannabis products, just as there is with alcohol, tobacco and food products. Such oversight and quality control, aimed at protecting personal and public health, would be accomplished with legalization and regulation at both the federal and state levels.

Oversight of the cannabis industry and practices has been sought through the establishment of California's Cannabis Advisory Committee under the Bureau of Cannabis Control (BCC). The committee advises the BCC and the other licensing authorities – the California Department of Food and Agriculture and the California Department of Public Health – on the development of regulations that help protect public health and safety and reduce the illegal market for cannabis. Similar to the Tobacco Education and Research Oversight Committee, the CAC began its work in November 2017, holding 10 meetings statewide in its inaugural year. The CAC released a report in 2018 that provided over 70 recommendations for the Bureau and other state agencies to implement related to cannabis.[lxxx]

It was anticipated that the California cannabis market place would take some time to shake out and settle, and data is still early about the effects of a legalized cannabis environment that is comparable to tobacco and alcohol regulation. However, an analysis comparing CDPH's initial regulations to tobacco control best practices revealed a need to prioritize public health over business interests - requiring stronger approaches to labeling, packaging, and product formulations.[lxxxi] The subsequent and adopted final regulatory package represents a responsive effort by state agencies to public health advocate concerns as the legal medical and recreational cannabis market plays out.

Unlike tobacco and alcohol regulation, there does not exist a federal structure that appropriately regulates cannabis and cannabis product marketing – due to its Schedule I status. As a result, there is not much conformity between states with respect to cannabis advertising regulations. As more states have legalized both medical and recreational cannabis use, and the cannabis products evolve, emerging brands have

developed sophisticated national marketing campaigns that could potentially have an effect across state lines. A case study of one brand in particular highlights this issue:

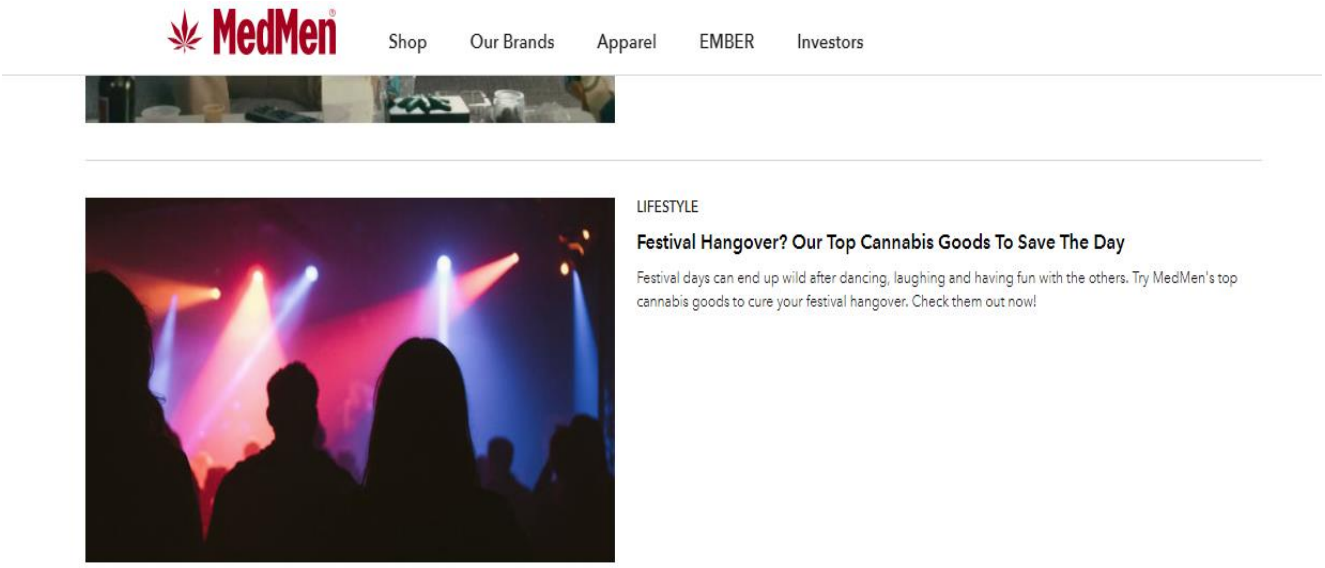


Figure 1: Screenshot from MedMen.com/blog/lifestyle

"MedMen is a US-based, publicly traded company that owns and operates licensed cannabis facilities involved with the cultivation, manufacture, and retail distribution of marijuana. The self-proclaimed "Apple Store of Weed," MedMen is a lifestyle marijuana brand that operates under its newest slogan: "Welcome to the new normal" and has locations in Arizona, California, Florida, Illinois, Nevada, and New York (including a flagship on Fifth Avenue). This past year, MedMen initiated a well-funded national advertising campaign, including advertising buys on The Howard Stern Show (with a potential audience of 100 million since Sirius XM's acquisition of Pandora) and The Adam Carolla Show (which holds the Guinness World Record for most downloaded podcast). Sleek, bright red billboards, YouTube videos, and social media advertisements coordinate both with the company's yoga and apparel line that are sold in all 50 states. With MedMen's product offerings, consumers can integrate marijuana into almost every aspect of their life, including bath soaps and bombs, candy, cosmetics, drink mixers or tincture, food, medicinal products (e.g., pain pills or sleep aids), pet products, sex lubricants, and vaporizers."[lxxxii]

As the authors note, health and medicine are implied in the name of this company, even though a majority of MedMen's stores sell recreational cannabis. The company's lifestyle blog includes claims that cannabis goods can "cure your festival hangover, such as sore feet, headaches, zapped energy, wave of blues (see Figure 1)."[lxxxiii] Despite these health claims, MedMen's products do not carry health warnings about the potential adverse effects of cannabis use.

Furthermore, more and more cannabis industry are engaging in alternative methods from traditional marketing – while paid advertising on Facebook and Google is restricted, many cannabis companies have still managed to promote themselves on social media. For example, Kim Kardashian threw a CBD-themed baby shower and her posts about the party most likely reached 12.3 million people.[lxxxiv] As one account executive mentions, digital marketing is the future of cannabis and they are seeking to maximize social media influencer campaigns, digital public relations and email marketing.[lxxxv] More recently, while Facebook does not currently permit advertising of cannabis-related businesses, whether digital, mail-order or brick and mortar, it is reportedly exploring loosening that restriction to permit licensed medical and recreational marijuana retailers to run ad campaigns. Previously Facebook reversed course to allow pages that include the words "cannabis" or "marijuana" to show up in its search results, at least for pages that had gone through the site's verification process.[lxxxvi]

There is also some concern that cannabis industry may be using advertising techniques and messages that appeal to youth, in many ways similar to attempts by Juul and other electronic cigarette companies. Just as with tobacco, the developing brain is more susceptible to addiction, and exposure among youth could potentially result in greater numbers of heavy users.[lxxxvii] Given the prevalence data indicating youth uptake of novel cannabis and tobacco products, such as electronic smoking devices and cannabis use (i.e., vaping), decreases in perception of harm related to using cannabis, and risk profile, a greater emphasis on federal oversight related to advertising protections is needed. Of concern, sixteen states have now reported 153 cases of serious, vaping-related respiratory illnesses in the past two months, and many of the patients are teenagers or young adults.[lxxxviii]

While the AUMA and subsequent California regulations placed restrictions on cannabis advertising, even with those restrictions, there are opportunities for retailers and manufacturers to promote cannabis to consumers, particularly online and on mobile apps, where age screens help marketers ensure they are not reaching consumers under 21 years old. Recently, the FDA held a public hearing during which it signaled that health claims associated with cannabis-related products was a primary concern. On July 22, the agency issued a warning letter to Curaleaf, a top CBD manufacturer, regarding its claims that several of its CBD products provide specific health benefits. The FDA cited the following Curaleaf health claims as problematic, among others:

- "CBD has been demonstrated to have properties that counteract the growth of [and/or] spread of cancer."
- "CBD was effective in killing human breast cancer cells."
- "CBD has also been shown to be effective in treating Parkinson's disease."
- "CBD has been linked to the effective treatment of Alzheimer's disease …."

A key component to preventing underage and other vulnerable group exposure to cannabis company advertising and targeted marketing is to restrict marketing and advertising practices that appeal to youth. AUMA prescribes various restrictions and requirements on the advertising or marketing of cannabis and cannabis products applicable to commercial cannabis licensees. For example, it prohibits cannabis companies from advertising or marketing their products using false or misleading health-related statements or claims. Advertising is permitted on broadcast, cable, radio, print and digital communications as long as 71.6% of the audience is "reasonably expected to be 21 years or older" based on audience composition data.

There has been some criticism from public health advocates that the marketing restrictions do not go far enough in preventing underage and other vulnerable group exposure. While cannabis is not subject to the same constraints on advertising restrictions as tobacco, the advertising of cannabis - even in states where it is legal - remains a grey area of the law.[lxxxix] A 2018 report issued by the California Cannabis Advisory Committee recommended that adult-use cannabis should not be allowed to make health claims in advertising.[xc] As of the report's release, the recommendation has not been implemented; however, the statute clearly prohibits a licensee from publishing or disseminating any advertising containing a health-related statement that is untrue or creates a misleading impression as to the effects of cannabis consumption on health conditions. The Bureau of Cannabis Control has included this in its disciplinary guidelines. CDPH regulations further state that health-related statements must be supported by a totality of publicly-available scientific evidence and be supported by significant scientific agreement. CDPH conducts product label reviews when conducting inspections of manufacturers to ensure they adhere to the statutory and regulatory requirements (see Section 40410 Labeling Restrictions).

Existing CMA policy recommends regulatory controls related to cannabis legalization should include advertising and marketing restrictions, monitoring and enforcement of industry practices, warning labels, and a strong data collection system to evaluate the consequences of use in an ongoing capacity.[xci] It also states that CMA urges strict regulations regarding sales and marketing of marijuana products be implemented, in line with existing regulations for alcohol and tobacco.[xcii]

TAX CANNABIS. The 2011 TAC report recommends that a tax be levied on cannabis as a means of collecting funds dedicated to regulation, enforcement and education. The California Department of Tax and Fee Administration is the state agency tasked with administering business permits and taxes, including those involving cannabis. Cannabis cultivators, processors, manufacturers, retailers, microbusinesses, and distributors making sales must now obtain a seller's permit from this agency. Similarly, distributors of cannabis and cannabis products must also register to obtain cannabis tax permits and to report and pay state cannabis taxes.

AUMA imposed taxes on the sale of both medical and recreational cannabis. The state levies two excise taxes on cannabis: a retail excise tax and a cultivation tax. The AUMA taxes recreational cannabis at a 15% excise tax, to be imposed upon the purchaser. This is in addition to any sales and use tax imposed by the state and local governments. Medical cannabis is exempt from the excise tax if the purchaser has a government-issued medical cannabis card indicating that they are a qualified patient or primary caregiver consistent with current law.

CALIFORNIA CANNABIS TAX REVENUE. In the first year of collecting cannabis taxes, the state fell short by over $100 million in projected tax revenue. California's Department of Tax and Fee Administration reported tax revenue collection of $345.2 million for the first full year of legalization (sales commenced on January 1, 2018). This was nearly half of the $643 million that was initially expected during the first full year of adult-use sales.[xciii] The Administration has acknowledged that there is considerable uncertainty in putting forth projections for cannabis tax revenue.

Additionally, a new Pew Charitable Trusts report confirms that market uncertainties will continue to be a challenge for revenue forecasters and policymakers. The difficulty in forecasting revenue is compounded by the fact that states have only recently begun to understand the recreational cannabis market: the level of consumer demand for cannabis products, the types of users and how much they might pay for the drug, and competition with the black market.[xciv] Given the complexity, size and how little was previously known about the California cannabis market, it is not surprising that uncertainty in tax revenue has been a factor thus far.

ILLICIT CANNABIS MARKET. It has been hypothesized that California's consolidation of industry and consistent enforcement is taking longer than expected, particularly because of a thriving illicit black market. As much as 80 percent of the cannabis sold in California comes from the black market, according to an estimate by New Frontier Data, a firm that tracks cannabis sales and trends.[xcv] Analysts also found that California's illicit cannabis market was valued at an estimated $3.7 billion last year, more than four times the size of the legal market.[xcvi] Of concern, unlicensed cannabis products have been linked to 21 cases in California of severe lung disease that appear to be connected to vaping.[xcvii]

Several of the reasons cited for the illicit cannabis market include:

- **TAX RATE:** Legal cannabis shops in the state pay a high tax rate. This includes a 15 percent excise tax on purchases of cannabis and cannabis products, local taxes that vary but average about 8 percent, and a wholesale tax of $9.25 for every ounce of cannabis flowers and $2.75 per ounce on cannabis leaves. For example, one legal cannabis shop reported a tax rate of almost 35 percent, which discourages compliance and consumer purchase. Black market cannabis retailers do not pay taxes and avoidance allows for lower cannabis prices. One estimate shows that black market cannabis may cost close to $80 per ounce less than legal cannabis.[xcviii]

- **LOCAL BAN ON CANNABIS SALES:** About 80 percent of California cities do not allow cannabis sales.[xcix] Regional variations in access to legal shops, may prompt some users to turn to illicit markets.
- **INADEQUATE ENFORCEMENT:** A 2018 report from the state Cannabis Advisory Committee on the first year of legal cannabis sales in California says there is problem that requires urgent action: "Fragmented and uncoordinated" enforcement has allowed the black market to flourish, threatening licensed business with unfair competition. While California officials have tripled the number of raids on unlicensed cannabis shops in the last year and seized $30 million in pot products, legal industry leaders say enforcement is still inadequate to break the dominance of the black market in the state.[c] A new audit by the state Department of Finance also concluded that the Bureau of Cannabis Control's ("Bureau") staffing and facilities are "not sustainable to provide effective and comprehensive oversight of cannabis activities throughout California."[ci] State budget issues have interfered with enforcing cannabis license laws, and the state relies heavily on coordination with local law enforcement to engage in stings. For example, the Costa Mesa Police Department served search warrants for the Bureau on two unlicensed pot shops, and authorities seized $2.7 million worth of cannabis products.[cii] However, many cities also have strained resources which limits their ability to help enforce the laws. More recently, the Bureau has launched a statewide public information program, "Get #weedwise", encouraging consumers to only purchase cannabis from licensed businesses and warning unlicensed businesses to become licensed.[ciii]

TAX ALLOCATION. California's revenue pays for administrative costs associated with cannabis legalization, and then uses excess funds for programs related to drug use, including economic development, academic studies, and youth programs. There still remain questions as to how the tax revenue for several of its allocations are to be spent. For example, AUMA specifies that 60 percent of leftover tax monies shall go to a Youth Education, Prevention, Early Intervention and Treatment Account, and it will be disbursed by the California Department of Health Care Services (DHCS) for programs designed to educate youth about and to prevent substance use disorders, and to prevent harm from substance use. DHCS shall enter into agreements with the California Department of Public Health and the California Department of Education to implement and administer these programs.

Other than specifying that cannabis be appropriately taxed, and that medical cannabis patients not be unduly financially burdened to access the medical market for state-specific health conditions, CMA has not weighed in on any of the specific issues that may affect revenue projections – for example, the rate at which the tax should be structured, local and state enforcement funding and priorities, and state government staffing. It should be noted that both Colorado and Washington adjusted cannabis regulation shortly after legalization in their states, suggesting California should continue to prioritize flexibility in the policy process to facilitate changes as needed. For example, Colorado, while struggling to meet its projections in the first three years after legalization, eventually exceeded its tax revenue projection.[civ]

FACILITATE DISSEMINATION OF RISKS AND BENEFITS OF CANNABIS USE. The 2011 TAC document recommended that the outcomes of clinical research should be publicly shared so as to educate the public. In 2019, the California Department of Public Health (CDPH) put forth a public awareness campaign called "Let's Talk Cannabis" with the goal of providing consumers with the facts about cannabis to help them make safe and informed choices. The goal is to share science-based information to increase awareness about cannabis and the potential health impacts. There are FAQ's available for certain high-risk groups, such as pregnant and breastfeeding women, youth, parents, etc. In support of the recommendation, CMA could partner with the state and other stakeholders to increase dissemination of these consumer-based resources.

CMA is concerned about the potential adverse health impacts associated with cannabis use in special-risk populations. Recently, the U.S. Surgeon General, Jerome Adams, issued an advisory on cannabis use and the developing brain. The advisory states the following:

> *"No amount of marijuana use during pregnancy or adolescence is known to be safe. Until and unless more is known about the long-term impact, the safest choice for pregnant women and adolescents is not to use marijuana. Pregnant women and youth--and those who love them--need the facts and resources to support healthy decisions. It is critical to educate women and youth, as well as family members, school officials, state and local leaders, and health professionals, about the risks of marijuana, particularly as more states contemplate legalization."*

At this point in time, there is limited information physicians can rely upon to properly discuss and recommend cannabis to patients. Recently, the Los Angeles County Department of Public Health offered a comprehensive course with Continuing Medical Education credit for health care providers entitled "The Evolving Science and Policy of Cannabis: What Health Professionals Need to Know."[cv] The course explains several of the medical and legal considerations surrounding cannabis, and educates health care providers so they may be equipped to screen for cannabis use and prepare to have informed discussions with their patients. Providers are also provided with supplemental articles for more in-depth information, on relevant topics such as:

- Screening and Referral for Cannabis Misuse and Cannabis Use Disorders;
- Cannabis Toxicity;
- Pregnant and Breastfeeding Women and Cannabis; and,
- Youth and Cannabis.

CMA is the ACCME-recognized continuing medical education (CME) accreditor for California. CMA offers a number of CME programs and services to support the lifelong learning of physicians and other health care professionals. Partnering with educational organizations to organize a CME course for

physicians on the cannabis-related clinical and policy components would be a way to increase physician education in this area.

EQUITY EFFORTS AND PROGRAMS RELATED TO CANNABIS CRIMINALIZATION. While discussed in the 2011 TAC report itself, CMA did not adopt policy on this topic in 2011. The War on Drugs has produced profoundly unequal outcomes across marginalized groups, particularly among low-income and communities of color. Disparities in arrests and incarceration are seen for both drug possession law violations as well as low-level sales.[cvi] Nearly 80 percent of people in federal prison and almost 60 percent of people in state prison for drug offense are African-American or Latino.[cvii] It is estimated that between 1915 and 2016, California law enforcement made 2,756,778 cannabis-related arrests. According to a report by the Drug Policy Alliance, there were approximately 500,000 people arrested for cannabis-related felonies and misdemeanors between 2006 - 2015.[cviii]

Elimination of policies that result in the unfair criminalization of low-income and communities of color is one way to address disproportionate drug law enforcement. For example, adjusting criminal records can have a significant impact on peoples' lives, as felonies and misdemeanors create barriers to employment, housing, public benefits and more. Recognizing that, AUMA allows a person currently serving a sentence for a cannabis-related conviction, who would not have been guilty of an offense, or who would have been guilty of a lesser offense under AUMA had that act been in effect at the time of the offense, to petition for a recall or dismissal of sentence. Under the law, people with certain felonies or misdemeanors on their records are now legally entitled to petition the courts to expunge or reduce their cannabis convictions. Some offenses that were crimes but are now legal include possessing up to an ounce of cannabis and growing up to six cannabis plants for personal use.

To help facilitate expungement, in 2018, the California Legislature passed AB 1793, which made AUMA reductions and sealing almost automatic. Under AB 1793, by July 1, 2019, the Department of Justice will be providing prosecuting agencies with a list of cases where there is a conviction that is potentially eligible for recall or dismissal of sentence, dismissal and sealing, or redesignation pursuant to Health and Safety Code Section 11361.8 based on the records in the state summary criminal history information database.[cix]

Enacting social equity programs are another way to repair some of the harms done to minorities by the War on Drugs. SB 1294 passed last year and established the California Cannabis Equity Act of 2018,

which allows a local jurisdiction to submit an application to the Bureau of Cannabis Control for a grant to assist local equity applicants and local equity licensees through that local jurisdiction's equity program. Equity programs provide a pathway for people impacted by the aggressive and overly punitive drug policies to access capital, receive technical support, and benefit from workforce development in the cannabis

industry. On July 31, 2019, the Bureau of Cannabis Control announced that it is accepting applications for grant funding authorized by the California Cannabis Equity Act of 2018 (Equity Act), established by Senate Bill 1294. The Bureau was appropriated $10 million to award to cities and counties assisting equity applicants and licensees through their local equity programs focusing on inclusion and support of persons in the cannabis industry who were negatively or disproportionately impacted by cannabis prohibition.[cx]

POSITION STATEMENT

The following position statement on the regulation of cannabis, was adopted by the CMA House of Delegates on October 26, 2019.

1. CMA supports federal legislation, including rescheduling cannabis, to encourage high quality and longitudinal cannabis research, including clinical and observational research, health policy and health economics research, public health and public safety research, especially in at-risk and under-researched populations, such as children and youth, older populations, pregnant and breastfeeding women, and heavy users.

2. CMA supports efforts to fund and improve federal and state-based public health surveillance efforts so as to encourage the systematic collection and development of a comprehensive database on the health effects of therapeutic and recreational cannabis use, including public health and public safety impacts.

3. CMA supports a tightly restricted regulatory system that will reduce negative impacts associated with cannabis legalization, particularly among youth and adolescent populations. CMA recommends that regulatory controls related to cannabis legalization should include advertising and marketing restrictions, monitoring and enforcement of industry practices, warning labels, and a strong data collection system to evaluate the consequences of use in an ongoing capacity.

4. CMA urges the development of strict labeling guidelines and regulations ensuring accuracy in ingredients and potency of all cannabis products sold as therapeutic or recreational products. CMA urges that strict regulations regarding sales and marketing of cannabis products be implemented, in line with existing regulations for alcohol and tobacco.

5. CMA supports a comprehensive state and federal regulatory structure that provides oversight and enforcement of advertising and marketing practices, particularly of misleading health claims and statements, by manufacturers and retailers selling cannabis and cannabis-derived products.

6. CMA recognizes that the safety of cannabis use during pregnancy, childhood or adolescence is not known.

7. CMA supports a targeted public education campaign on the health impacts of cannabis use, including cannabis use disorder, specific to particular populations. Such education should emphasize the potential for serious adverse effects in particular populations and identify conditions for which evidence provides

some support for therapeutic use. Public education should address the increased risks of serious adverse effects, particularly for youth, pregnant and breastfeeding women, associated with vaping and other methods of delivery; more frequent use; and from the use of unregulated or high potency cannabis.

8. CMA urges the state to fund and increase enforcement and surveillance efforts of unlicensed cannabis dispensaries to reduce the size of the illegal market.

9. CMA will identify and increase clinician education and training opportunities to improve familiarity with the health impacts related to cannabis, including risks and benefits, the evidence-base and state of research as it enhances neuroscience knowledge, and the medical and legal implications associated with cannabis and cannabis-derived products.

10. CMA supports physician expert led development of more consistent and clinically informed policies and protocols for health plans, health systems and hospitals around the use of cannabis.

11. CMA supports social equity efforts, such as cannabis equity programs and record expungement, to rectify the damage caused by punitive cannabis policies that have disproportionately impacted low-income and communities of color.

12. CMA opposes "Zero Tolerance" enforcement policies as applicable to cannabis use that result in suspension or expulsion of students, and thus jeopardize access to education for students. Such students should have access to strategies for early intervention and treatment when indicated.

13. CMA supports access to medically necessary interventions, as provided by appropriately trained clinicians, for individuals in custody of law enforcement and/or criminal justice authorities (arrest, detention, jailing or imprisonment) who suffer from cannabis use disorder.

14. CMA will promote awareness of poisoning of infants, children and pets through unintentional ingestion of cannabis products and support education and other measures to decrease accidental ingestion.

15. CMA supports the immediate ban on sales of vaping products until further scientific studies can be done to ensure the short-term and long-term safety of these products.

16. CMA opposes policies of health plans, health systems, and hospitals that have pain management programs that automatically eliminate patients who use therapeutic cannabis.

[i] Substance Abuse Center for Behavioral Health Statistics and Quality. Results from the 2017 National Survey on Drug Use and Health: Detailed Tables. SAMHSA.

[ii] Russo, E.B., and Guy G.W., A Tale of Two Cannabinoids: the Therapeutic Rationale for Combining Tetrahydrocannabinol and Cannabidiol, Medical Hypotheses 66(2):234–246 (2006).

[iii] ElSohly, M. A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J. C. (2016). Changes in cannabis potency over the last 2 decades (1995-2014): Analysis of current data in the United States. Biological Psychiatry, 79, 613-619.

[iv] https://thehill.com/hilltv/rising/447080-surgeon-general-warns-marijuana-could-be-more-dangerous-than-it-was-a-decade

[v] Ehrler, M. R., E. C. Deborah, and D. A. Yurgelun-Todd. 2015. Subjective and cognitive effects of cannabinoids in marijuana smokers. In P. Campolongo and L. Fattore (eds.), Cannabinoid modulation of emotion, memory, and motivation. New York: Springer. Pp. 159–181.

[vi] Abrams, D. I., H. P. Vizoso, S. B. Shade, C. Jay, M. E. Kelly, and N. L. Benowitz. 2007. Vaporization as a smokeless cannabis delivery system: A pilot study. Clinical Pharmacology and Therapeutics 82(5):572–578.

[vii] Loflin, M., and M. Earleywine. 2014. A new method of cannabis ingestion: The dangers of dabs? Addictive Behaviors 39(10):1430–1433.

[viii] Ghosh, A., and D. Basu 2015. Cannabis and psychopathology: The meandering journey of the last decade. Indian Journal of Psychiatry 57(2):140–149.

[ix] H.R. 5485. https://www.congress.gov/bill/115th-congress/house-bill/5485

[x] National Survey on Drug Use and Health (NSDUH), Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, 2017.

[xi] Schauer, G. L., B. A. King, R. E. Bunnell, G. Promoff, and T. A. McAfee. 2016. Toking, vaping, and eating for health or fun: Marijuana use patterns. American Journal of Preventive Medicine 50(1):1–8.

[xii] Hughes, M., R. Lipari, and M. Williams, State Estimates of Adolescent Marijuana Use and Perceptions of Risk of Harm from Marijuana Use: 2013 and 2014, in SAMHSA - The Center for Behavioral Health Statistics and Quality Report. 2015.

[xiii] National Survey on Drug Use and Health (NSDUH), Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, 2017.

[xiv] Wadsworth, E. and Hammond, D. (2018), Differences in patterns of cannabis use among youth: Prevalence, perceptions of harm and driving under the influence in the USA where non-medical cannabis markets have been established, proposed and prohibited. Drug Alcohol Rev., 37: 903-911. doi:10.1111/dar.12842

[xv] Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2019). Monitoring the Future national survey results on drug use 1975-2018: Overview, key findings on adolescent drug use. Ann Arbor: Institute for Social Research, University of Michigan

[xvi] Ibid.

[xvii] California Department of Public Health and California Tobacco Control Program, 2016 California Student Tobacco Survey. 2016.

[xviii] The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

[xix] Guidance for State Medical Cannabis Testing Programs. 2016, Association of Public Health Laboratories.

[xx] BDS Analytics. https://bdsanalytics.com/are-old-school-concentrates-still-on-fire/

[xxi] Arcview Group. Edibles. https://arcviewgroup.com/product/edibles/

[xxii] Brightfield Group. https://www.brightfieldgroup.com/post/cbd-worth-22-billion-by-2022

[xxiii] https://www.governing.com/gov-data/safety-justice/state-marijuana-laws-map-medical-recreational.html

[xxiv] Justice Department Issues Memo on Marijuana Enforcement (January 4, 2018), DOJ website at www.justice.gov/opa/pr/justicedepartment-issues-memo-marijuana-enforcement

[xxv] Christopher Ingraham, How the Justice Department seems to have misled Congress on medical marijuana, The Washington Post (August 6, 2015), available at www.washingtonpost.com/news/wonk/wp/2015/08/06/the-justice-department-says-it-misled-congress-on-medical-marijuana/

[xxvi] NIH. Marijuana Research. https://www.drugabuse.gov/drugs-abuse/marijuana/nih-research-marijuana-cannabinoids

[xxvii] The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

[xxviii] Fox Rothschild. Cannabis Industry State Tax Guide. https://www.foxrothschild.com/content/uploads/2018/08/Cannabis-Tax-E-book-Septemberv2-2018-2.pdf

[xxix] Health & Safety Code §§11362.7 to 11362.83 (S.B. 420, Stats. 2003, ch. 875)

[xxx] Business & Professions Code §§19300 *et seq.* (A.B. 243, States. 2015, ch. 688; A.B. 266, Stats. 2015, ch. 689; S.B. 643, Stats. 2015, ch. 719).

[xxxi] Health & Safety Code §11362.1; Proposition 64.

[xxxii] CMA Health Law Library document #3209, "Medical Cannabis"

[xxxiii] Nugent SM, Morasco BJ, O'Neil ME, et al. The effects of cannabis among adults with chronic pain and an overview of general harms. Ann Intern Med. 2017;167(5):319-331. doi:10.7326/M17-0155

[xxxiv] Campbell G, Hall W, Degenhardt L, Dobbins T, Farrell M. Cannabis use and non-cancer chronic pain—authors' reply. Lancet Public Health. 2018;3(10):e469. doi:10.1016/S2468-2667(18)30182-8.

[xxxv] Stockings E, Campbell G, Hall WD, et al. Cannabis and cannabinoids for the treatment of people with chronic noncancer pain conditions: a systematic review and meta-analysis of controlled and observational studies. Pain. 2018;159(10):1932-1954. doi:10.1097/j.pain.0000000000001293

[xxxvi] Hill KP. Medical Use of Cannabis in 2019. JAMA. Published online August 09, 2019322(10):974–975. doi:10.1001/jama.2019.11868

[xxxvii] Humphreys K, Saitz R. Should physicians recommend replacing opioids with cannabis? [published online February 1,2019]. JAMA. doi:10.1001/jama.2019.0077

[xxxviii] Psychiatry Advisor. Substitution of Opioids With Cannabis Not Recommended for Treating Addiction. April 8, 2019/ https://www.psychiatryadvisor.com/home/topics/addiction/substitution-of-opioids-with-cannabis-not-recommended-for-treating-addiction/

xxxix Andrew H. Rogers, Jafar Bakhshaie, Julia D. Buckner, Michael F. Orr, Daniel J. Paulus, Joseph W. Ditre, Michael J. Zvolensky. Opioid and Cannabis Co-Use among Adults With Chronic Pain. Journal of Addiction Medicine, 2019; 13 (4): 287 DOI: 10.1097/ADM.0000000000000493.

xl Finn K. Why Marijuana Will Not Fix the Opioid Epidemic. Mo Med. 2018;115(3):191–193.

xli APA (American Psychiatric Association). 2013. Diagnostic and statistical manual of mental disorders, 5th ed. Arlington, VA: American Psychological Association

xlii Patel J, Marwaha R. Cannabis Use Disorder. [Updated 2019 Jun 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538131/

xliii Casajuana, C., H. López-Pelayo, M. M. Balcells, L. Miguel, J. Colom, and A. Gual. 2016. Definitions of risky and problematic cannabis use: A systematic review. Substance Use & Misuse 51(13):1760–1770.

xliv The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

xlv Ibid.

xlvi Hasin DS, Saha TD, Kerridge BT, et al. Prevalence of Marijuana Use Disorders in the United States Between 2001-2002 and 2012-2013. JAMA Psychiatry. 2015;72(12):1235–1242. doi:10.1001/jamapsychiatry.2015.1858

xlvii Lopez-Quintero C, Pérez de los Cobos J, Hasin DS, et al. Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: Results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Drug Alcohol Depend. 2011;115(1-2):120-130. doi:10.1016/j.drugalcdep.2010.11.004

xlviii Gorelick, DA. Treatment of cannabis use disorder in adults. August 2019. https://www.uptodate.com/contents/treatment-of-cannabis-use-disorder-in-adults#H2175132357

xlix DEA. https://www.dea.gov/sites/default/files/2018-11/DIR-032-18%202018%20NDTA%20final%20low%20resolution.pdf

l 2017 Statewide Needs Assessment and Planning Report, California Outcomes Measurement System Treatment. California Department of Health Care Services
http://www.dhcs.ca.gov/formsandpubs/publications/Documents/SNAP_2017_Report_FINAL.pdf

li Marijuana use during pregnancy and lactation. Committee Opinion No. 722. American College of Obstetricians and Gynecologists. Obstet Gynecol. 2017;130:e205–9. doi:10.1097/01.AOG.0000467192.89321.a6

lii Bailey, J. R., H. C. Cunny, M. G. Paule, and W. Slikker, Jr. 1987. “Fetal disposition of delta 9-tetrahydrocannabinol (THC) during late pregnancy in the rhesus monkey.” Toxicol Appl Pharmacol 90 (2):315-21.

liii Hutchings, D. E., B. R. Martin, Z. Gamagaris, N. Miller, and T. Fico. 1989. “Plasma concentrations of delta-9-tetrahydrocannabinol in dams and fetuses following acute or multiple prenatal dosing in rats.” Life Sci 44 (11):697-701

liv Gunn, J. K., C. B. Rosales, K. E. Center, A. Nunez, S. J. Gibson, C. Christ, and J. E. Ehiri. 2016. “Prenatal exposure to cannabis and maternal and child health outcomes: a systematic review and meta-analysis.” BMJ Open 6 (4):e009986. doi: 10.1136/bmjopen-2015-009986.

lv Gunn JK, Rosales CB, Center KE, Nunez A, Gibson SJ, Christ C, Ehiri JE. Prenatal exposure to cannabis and maternal and child health outcomes: A systematic review and meta-analysis.BMJ Open 2016 Apr 5; 6(4):e009986,2015-009986

lvi Gunn JK, Rosales CB, Center KE, Nunez A, Gibson SJ, Christ C, Ehiri JE. Prenatal exposure to cannabis and maternal and child health outcomes: A systematic review and meta-analysis.BMJ Open 2016 Apr 5; 6(4):e009986,2015-009986

lvii Porath AJ, Konefal S, Kent P. Clearing the smoke on cannabis: Maternal cannabis use during pregnancy—an update. Ottawa, ON: Canadian Centre on Substance Use and Addiction; 2018

lviii Day N, Richardson G. Maternal Health Practices and Child Development Study, 1991.

lix https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Marijuana-Use-During-Pregnancy-and-Lactation

lx AAP. http://pediatrics.aappublications.org/content/pediatrics/early/2018/08/23/peds.2018-1889.full.pdf

lxi The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

lxii Green KM, Ensminger ME. Adult social behavioral effects of heavy adolescent marijuana use among African Americans. Dev Psychol. 2006;42(6):1168-1178.

lxiii Meier MH, Caspi A, Ambler A, et al. Persistent cannabis users show neuropsychological decline from childhood to midlife. Proc Natl Acad Sci U S A. 2012;109(40):E2657-E2664

lxiv Gobbi G, Atkin T, Zytynski T, et al. Association of cannabis use in adolescence and risk of depression, anxiety, and suicidality in young adulthood: a systematic review and meta-analysis. JAMA Psychiatry. 2019;76(4):426-434.

lxv Hall KE, Monte AA, Chang T, et al. Mental health-related emergency department visits associated with cannabis in Colorado. Acad Emerg Med. 2018;25(5):526-537.

lxvi Wang GS, Davies SD, Halmo LS, Sass A, Mistry RD. Impact of marijuana legalization in Colorado on adolescent emergency and urgent care visits. J Adolesc Health. 2018;63(2):239-241.

lxvii Kuepper R, van Os J, Lieb R, Wittchen HU, Höfler M, Henquet C. Continued cannabis use and risk of incidence and persistence of psychotic symptoms: 10 year follow-up cohort study. BMJ. 2011;342:d738.

lxviii Colorado. Impacts of Marijuana Legalization. https://www.colorado.gov/pacific/publicsafety/news/colorado-division-criminal-justice-publishes-report-impacts-marijuana-legalization-colorado

lxix The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

lxx Nutt, D. J., L. A. King, and D. E. Nichols. 2013. Effects of Schedule I drug laws on neuroscience research and treatment innovation. Nature Reviews Neuroscience 14(8):577–585.

lxxi Health & Safety Code Sections §11480 & §11481

lxxii The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

lxxiii DEA. https://www.federalregister.gov/documents/2016/08/12/2016-17955/applications-to-become-registered-under-the-controlled-substances-act-to-manufacture-marijuana-to

lxxiv https://swalwell.house.gov/sites/swalwell.house.gov/files/LettertoDOJDEAreCannabis%20May%202019.pdf

lxxv https://www.documentcloud.org/documents/6209820-SRI-Petition-for-Marijuana-Growing.html

lxxvi https://s3.amazonaws.com/public-inspection.federalregister.gov/2019-18456.pdf?utm_source=federalregister.gov&utm_medium=email&utm_campaign=pi+subscription+mailing+list

lxxvii UCSD. Background of Cannabis Research Projects. https://www.cmcr.ucsd.edu/index.php/background

lxxviii The National Academies of Sciences Engineering and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC: The National Academies Press. 2017.

lxxix Ibid

lxxx BCC. Annual Report 2018. https://www.bcc.ca.gov/about_us/documents/cac_annual_report_2018.pdf

lxxxi Daniel G. Orenstein & Stanton A. Glantz (2018) Regulating Cannabis Manufacturing: Applying Public Health Best Practices from Tobacco Control, Journal of Psychoactive Drugs, 50:1, 19-32, DOI: 10.1080/02791072.2017.1422816

lxxxii Ayers JW, Caputi T, Leas EC. The Need for Federal Regulation of Marijuana Marketing. JAMA. Published online May 16, 2019321(22):2163–2164. doi:10.1001/jama.2019.4432

lxxxiii Medmen. https://medmen.com/blog/lifestyle/festival-hangover-our-top-cannabis-goods-to-save-the-day

lxxxiv Hsu, Tiffany. Ads Pitching CBD as a Cure-All Are Everywhere. Oversight Hasn't Kept Up. New York Times, August 13, 2019. https://www.nytimes.com/2019/08/13/business/media/cbd-marijuana-fda.html

lxxxv Fotis Georgiadis. Medium. https://medium.com/authority-magazine/digital-marketing-is-the-future-of-cannabis-3f7e9597d82c

lxxxvi https://www.benzinga.com/markets/cannabis/18/10/12500581/facebook-to-allow-verified-cannabis-pages

lxxxvii Ayers JW, Caputi T, Leas EC. The Need for Federal Regulation of Marijuana Marketing. JAMA. Published online May 16, 2019321(22):2163–2164. doi:10.1001/jama.2019.4432.

lxxxviii CDC. https://emergency.cdc.gov/newsletters/coca/081619.htm

lxxxix Public Health Law Center. http://www.publichealthlawcenter.org/sites/default/files/resources/tclc-synopsis-marijuana-tobacco-2015_0.pdf

xc BCC. Annual Report 2018. https://www.bcc.ca.gov/about_us/documents/cac_annual_report_2018.pdf

xci BOT 102-17

xcii HOD 111-15

xciii CDTFA. Cannabis Tax Revenue 2018. https://cannabis.ca.gov/2019/02/19/california-department-of-tax-and-fee-administration-reports-cannabis-tax-revenues-for-fourth-quarter-of-2018/

xciv Pew Charitable Trusts. Forecasts Hazy for State Marijuana Revenue, August 2019. https://www.pewtrusts.org/-/media/assets/2019/08/sfh_forecast_hazy_for_state_marijuana_revenue_updated.pdf

xcv Murphy, Kevin. Cannabis' Black Market Problem. April 4, 2019. https://www.forbes.com/sites/kevinmurphy/2019/04/04/cannabis-black-market-problem/

xcvi McGreevy, Patrick. California's black market for pot is stifling legal sales. Now the governor wants to step up enforcement, February 18, 2019. https://www.latimes.com/politics/la-pol-ca-gavin-newsom-crackdown-pot-black-market-20190219-story.html

xcvii Allday, Erin. Unlicensed marijuana vaping products eyed in 20 states. August 21, 2019. https://www.sfchronicle.com/news/article/Unlicensed-marijuana-vaping-products-eyed-in-20-14369013.php

xcviii Statistica. Most expensive U.S. marijuana dispensary prices compared to street prices as of January 2016, by state (in U.S. dollars). https://www.statista.com/statistics/589821/street-and-dispensary-marijuana-price-difference-by-us-state/

xcix Fuller, Thomas. 'Getting Worse, Not Better': Illegal Pot Market Booming in California Despite Legalization April 17, 2019. https://www.nytimes.com/2019/04/27/us/marijuana-california-legalization.html

c McGreevy, Patrick. California seizes $30 million in black market cannabis from illegal pot shops. July 22, 2019. https://www.latimes.com/california/story/2019-07-19/california-crackdown-illegal-pot-shops-marijuana

ci DOF. Audit of BCC. July 2019. https://esd.dof.ca.gov/reports/reportPdf/4D56A90E-BC9D-E911-9108-00505685B5D1/Bureau%20of%20Cannabis%20Control%20Performance%20Audit%20July%202019

cii McGreevy, Patrick. California seizes $30 million in black market cannabis from illegal pot shops. July 22, 2019. https://www.latimes.com/california/story/2019-07-19/california-crackdown-illegal-pot-shops-marijuana

ciii BCC. Advisory Committee. https://bcc.ca.gov/about_us/documents/media_20190621.pdf

civ Marketwatch. https://www.marketwatch.com/story/heres-what-the-numbers-show-about-the-impact-of-legalizing-marijuana-2019-04-09

cv LA County Department of Public Health. CME Cannabis. http://rx.ph.lacounty.gov/RxCannabis0918

cvi Drug Policy Alliance. http://www.drugpolicy.org/issues/race-and-drug-war

cvii Drug Policy Alliance.http://www.drugpolicy.org/resource/drug-war-mass-incarceration-and-race-englishspanish

cviii Drug Policy Alliance.http://www.drugpolicy.org/news/2016/08/its-not-legal-yet-nearly-500000-marijuana-arrests-california-last-decade

cix Assembly Bill 1793. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB1793

cx BCC. Equity Grant Program. https://www.bcc.ca.gov/about_us/equity_grant.html