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Mile High Macaroons: The Medicalization of Marijuana in Colorado

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Abstract

Since the passage of Amendment 20 in November 2000, over two percent of Colorado's population has registered with the state to possess and use marijuana for medical purposes. Entry to the registry requires the recommendation of a physician for any of eight conditions, but 94 percent of users are registered for severe pain. The average age of registrants is 40 years old, and 69 percent of registrants are male. The registry requires the recommendation of a physician, and while more than 1,200 of the state's physicians have signed a medical marijuana registry form, 49 percent of all users were registered by one of just fifteen physicians. To service this demand, Colorado is now home to more than a third of America's marijuana dispensaries. Colorado's embrace of medical marijuana is due to high preexisting use of marijuana, minimal barriers to amending the state's constitution, difficulties regulating the medical marijuana industry, and entrepreneurial physicians. The social effects of the medicalization of marijuana remain impressionistic, but preliminary data are concerning.

Keywords

Cannabis, Colorado, legalization, medical marijuana, patient-doctor relationship, substance abuse

The city of Denver, Colorado's capitol and largest city, has more marijuana dispensaries than public schools, liquor stores, or even Starbucks coffee shops, an oft-cited statistic that suggests the extent of the state's medical marijuana industry (1). The city's many dispensaries advertise on street corners and in local newspapers, offering discounts and free samples of marijuana strains with evocative monikers ("Bruce Banner," "Dirt Weed," "White Widow," and "Stevie Wonder") along with sodas, ice creams, pizzas, and baked goods like "Mile High Macaroons," all prepared with marijuana.

The Mile High City is home to the nation's fastest-growing medical marijuana industry and capitol of the state with the largest per capita use of medical marijuana in the country. In this article, we review the use of marijuana by Coloradoans before medicalization, the development of the medical marijuana registry, attempts to regulate medical marijuana, the demographics of its use, the medical marijuana industry, the relationships between physicians and patients, the available mental health and substance abuse services, and the still-developing effects of medical marijuana on the state's communities.

Pre-Medicalization Use of Marijuana

The use of marijuana was quite prevalent in Colorado before the legalization of medical marijuana. In the 2000 *National Household Survey on Drug Abuse,* Colorado was one of seven states ranked in the top fifth for past month marijuana use among both adolescents and adults. The survey estimated that 10.89 percent of Coloradoans 12 to 17 years old, 20.49 percent of 18 to 25 year olds, and 5.21 percent of adults 26 years or older had used marijuana in the past month, well above the national average in every age group. Further, the survey found that Coloradoans were far less likely than other Americans to perceive that smoking marijuana once a month posed a great risk to their health, with only 27.20 percent of Coloradoans 12 to 17 years old, 20.28 percent of 18 to 25 year olds, and 34.44 percent of adults 26 years or old believing it constituted a great risk (2).

The federal survey of substance abuse treatment, the *National Survey of Substance Abuse Treatment Services*, that was conducted in October 2000 did not include questions specific to marijuana abuse. However, investigators identified Colorado as second only to the District of Columbia in the percentage of its population enrolled in substance abuse treatment. The survey found that for every 100,000 Americans aged 12 or older, 428 of them were in substance abuse treatment. Simultaneously, for every 100,000 Coloradoans aged 12 or older, 825 of them were in substance abuse treatment, a figure almost twice the national average (3). This occurred despite Colorado ranking last among American states in per capita state funding for substance abuse treatment, prevention, and research in a 2001 survey (4).

In the year preceding Colorado's medicalization of marijuana, two large, federally-funded surveys identified Colorado as a state where a large proportion of the population was in treatment for substance abuse, where marijuana was widely used, and its use was less often perceived as a significant health risk.

Amendment 20 Medicalizes Marijuana

Colorado's constitution has been characterized as the easiest in the nation to amend because citizens can place an amendment on the state ballot with only a small number of signatures, and an amendment

requires only a simple majority to pass (5). The advocacy group Coloradoans for Medical Rights spent $248,013 in support of Amendment 20, a citizen-initiated amendment that was on Colorado's November 2000 ballot (6).

Amendment 20 passed with 54 percent of the vote; while it did not legalize either the use or possession of marijuana, the Amendment provided an affirmative defense for the use or possession of marijuana by a patient and their caregiver if a physician recommended its use (7). In Colorado, the relationship between these three parties—the patient, the caregiver, and the physician—are critical to understanding the medicalization of marijuana and the development of the medical marijuana industry.

Amendment 20 describes a patient as someone with one of eight qualifying "debilitating" conditions that include both specific diseases (cancer, epilepsy, HIV/AIDS, glaucoma) and non-specific symptoms (cachexia, muscle spasms, severe nausea, severe pain) who would like to use marijuana to alleviate these conditions. The amendment has no exclusion criteria, so a history of mental illness, substance abuse, or adverse response to marijuana is no obstacle to registering with the state to use marijuana. Patients may grow their own marijuana, or they may designate someone else to grow it on their behalf.

Amendment 20 defines a "caregiver" as "a person, other than the patient and the patient's physician, who is eighteen years of age or older and has significant responsibility for managing the well-being of a patient who has a debilitating medical condition" (8). The caregiver can legally possess or grow marijuana on behalf of a patient, but the amendment does not specify any training or regulations for these caregivers, even though possessing or growing marijuana remains a violation of federal law, as marijuana remains a Schedule I substance that is illegal to possess or use under federal law. As we will see, in practice a caregiver often means an industrial-scaled and for-profit business.

Amendment 20 does not specify that the recommending physician be trained in the medical use of marijuana or even have an unrestricted DEA license, just a Colorado medical license. The physician need only agree that a registrant has a "serious or chronic illness" and "might benefit from medical use of marijuana." The amendment does not explain how a physician determines who "might benefit from medical use of marijuana," does not require the performance of any examination or medical records to confirm the existence of the qualifying conditions, does not require the failure of other treatments, does not require communication with a person's other physicians, and does not require an ongoing patient-physician relationship (8).

Attempts to Regulate Medical Marijuana

Colorado's Department of Public Health and Environment (CDPHE) is the state agency responsible for managing the medical marijuana registry. CDPHE has struggled with the tensions between federal law, where possession of marijuana remains illegal, and state law, which was altered by Amendment 20 to include an affirmative defense in favor of the possession of marijuana. Over the past decade, the CDPHE has attempted to refine the ambiguous relationships between a medical marijuana patient, caregiver, and physician that Amendment 20 enacted.

In June 2001, the CDPHE began accepting applications to its medical marijuana registry, initially requiring a $140 fee; the current fee is $90 is to register and an additional $90 to renew each year but can be waived if a patient qualifies under the state's indigent care program (9). In 2004, the Colorado Department of Public Health and Environment began issuing registry cards to caregivers, the people who could possess or grow marijuana on behalf of registrants. However, this effectively put the state in the business of licensing marijuana growers, and the CDPHE concluded they did not have authority to issue caregiver cards because that implied state approval of an act that was illegal on a federal level. Instead, after examining the home health care programs and medical marijuana systems in other states, the CDPHE designed a regulatory system for the relationship between caregivers and their patients. In their model, caregivers would, like home-health aides, provide a range of services to patients and could provide these services to no more than five people. In November 2007, this model and the patient limit were struck down in Denver District Court for altering state law without public input (10). At the time, medical marijuana remained a marginal activity because at the end of 2008, eight years after the passage of Amendment 20, fewer than 9,000 Coloradoans had registered with the state to use and possess marijuana for a medical condition (11).

In 2009, the landscape shifted considerably. First, in March 2009, the newly-appointed United States Attorney General Eric Holder announced that the administration would give low priority to the prosecution of the use and possession of marijuana in states where use and possession were legal, reducing fear of federal prosecution, a significant deterrent to operating a business that sells a federally-prohibited substance (12). Second, the state's CDPHE again attempted to define a caregiver as someone who helped patients with their daily activities like a home health aide and to limit the number of patients who could be associated with an individual caregiver to no more than five people. During a public hearing attended by five hundred medical marijuana advocates in July 2009, the Colorado Board of Health dismissed these limits by a 4-3 vote (13). The vote effectively defined a caregiver minimally as an entity whose sole responsibility was to provide marijuana to a registrant, despite the more expansive definition in the state constitution that was quoted above, and opened the Colorado market to large-scale dispensaries.

The Demographics of Medical Marijuana Use

Freed from the threats of federal prosecution and involved relationships to registrants, the medical marijuana registry has experienced dramatic growth since 2009.

In the applications processed by the CDPHE by the end of March 2011, the average age of registrants is 40 years old, and 69 percent of registrants are male. The CDPHE has received 137,556 applications and issued 123,890 registry cards. Only forty of the registrants are under the age of 18 (14). More than 2 percent of the state's population is now registered to use medical marijuana, and, on a per capita basis, Colorado has twice as many medical marijuana users as California (7). Analyses of this data reveal that medical marijuana registration is highest in Colorado's ski counties, which has the state's highest median income and educational levels (15).

In the applications processed by the CDPHE by the end of March 2011, 94 percent of Colorado medical marijuana registrants are qualified for severe pain. Figure 1 enumerates the medical conditions for which users are qualified to take medical marijuana; note that users can be qualified for more than one condition (14). The average medical marijuana user in Colorado is a middle-aged man that was registered by one of fifteen physicians for severe pain.

Growing the Medical Marijuana Industry

A recent summary of the nation's medical marijuana markets by the American Cannabis Research Institute hailed Colorado "as the fastest growing and most business-friendly market." The report, based on voluntary surveys of medical marijuana dispensary owners, concluded that together California and Colorado constitute 92 percent of all medical marijuana sales in the United States' $1.7 billion medical marijuana industry (16). While it is difficult to evaluate the accuracy of this claim because it is based on survey data, the implication is clear—medical marijuana is a growing industry in Colorado.

The CDPHE reports that by the end of March 2011, sixty-three percent of the state's medical marijuana registrants had designated a specific caregiver (14). It is unclear from the CDPHE how many of those caregivers are dispensaries, but it is clear that dispensaries, establishments where medical marijuana can be purchased, have become the public face of medical marijuana in Colorado. By presenting a Colorado medical marijuana registry card, a person can purchase up to two ounces, or more if medically necessary, from a dispensary. In August 2009, a medical marijuana patient was acquitted for possession of two pounds of marijuana after arguing that he needed more medicine because of the severity of his illness (17). Until 2010, people could use marijuana in the dispensaries, so many of them resembled a coffee shop or bar more than a pharmacy, a business where the substance was both purchased and consumed, but it has now become illegal for a patient to use their marijuana onsite. Despite this change, as recently as April 2011, marijuana dispensary employees were themselves complaining that some dispensaries were giving out free marijuana for public consumption at conventions (18). Dispensaries compete for patrons as vigorously as the bars of Colorado, taking out advertisements in local newspapers and offering incentives like free joints on birthdays and discounted prices on weekdays.

In 2010, the Drug Enforcement Administration announced the results of criminal background checks it conducted on the owners of medical marijuana dispensaries. The DEA found that 18 percent of owners had felony convictions, 28 percent had been arrested in connection with drug crimes, and four owners had been arrested on murder or involvement with a homicide charge (19).

In June 2010, in response to the concern of legislators that the dispensaries were poorly regulated, Colorado House Bill 1284 was signed by then-governor Bill Ritter. House Bill 1284 created a medical marijuana licensing authority within the state's Department of Revenue, prohibited non-residents and transplants of less than two years from operating a dispensary, prohibited people convicted of drug-related felonies or of any felony in the past five years from operating a dispensary, required dispensaries to grow a minimum of 70 percent of the marijuana they sell, allowed local municipalities to ban dispensaries and associated marijuana-growing operations in their town, placed a one-year moratorium on new dispensaries, and specifically distinguished between dispensaries and caregivers. In short, the law regulated dispensaries at the state level while increasing local control, denied dispensaries the constitutional protections afforded to caregivers by Amendment 20, and effectively required grow operations to affiliate with a dispensary (20). As a result, municipalities have begun shutting down dispensaries and grow operations that operate in violation of these new regulations (21).

House Bill 1284 requires the dispensaries to report their business to the state's Department of Revenue, allowing for a better approximation of the scope of the industry. While we were unable to locate a comprehensive portrait of this revenue for this publication, we know that as of September 2010, 809 dispensaries were registered in Colorado, more than a third of all the nation's dispensaries (7). The state requires dispensaries to pay annual licensing fees of $7500 to serve 300 or fewer patients, $12,500 to serve 301 to 500 patients, and $18,000 to serve 501 or more patients, along with additional fees to cultivate marijuana or manufacture edible products containing marijuana (22). In the fiscal year ending June 30, 2010, the state collected $8.2 million in licensing fees. The state received 818 applications to operate dispensaries, 321 applications to make products containing marijuana, and 1,237 applications to cultivate marijuana (23). Many of the state's municipalities are similarly assessing licensing fees on dispensaries and grow operations. The state is also collecting sales tax on the purchase of medical marijuana. By November 2010, the state had collected $2.2 million in sales tax from medical marijuana sales, and the cities of Denver and Colorado Springs collected, respectively, an additional $2.2 million and

$380,000 in local sales taxes (24). In all, the state of Colorado itself is estimated to annually receive $20 million in registration fees, dispensary and grow-operation licenses, and sales tax (25).

Effects on Substance Abuse and Treatment

Since the majority of medical marijuana registrants joined the registry since 2008, it is difficult to know the precise impact of medicalization on the prevalence of substance abuse and treatment. Anecdotally, we note that at the public safety-net hospital where we practice, the routine urine drug screen no longer includes cannabis because its use is believed to be so prevalent. We hear frequently from patients in substance abuse treatment that they will not discontinue marijuana because a doctor recommended it.

A recent survey of adolescents admitted to a Denver substance abuse treatment program found that, while none of them were themselves registered to use medical marijuana, 81.3 percent of them knew someone registered to use medical marijuana and that 48.8 percent of these adolescents had obtained marijuana from someone registered to use (26). At least one adult, a fifty-one year old high school cafeteria manager, has been arrested for diverting marijuana to adolescents (27). We are conducting a survey about use and diversion among adults but are unable to report data at this time.

Unfortunately, the effects, if any, of medical marijuana on substance abuse in Colorado are not fully reflected in the federally-funded surveys that are the best measure of statewide trends in substance use, abuse, and treatment. As of this writing, data from the National Household Survey on Drug Abuse is available only through the year 2008, when medical marijuana use began to accelerate and marijuana dispensaries became publicly visible. According to these surveys, the estimated percentage of Coloradoans who had used marijuana in the past year does not appear to have varied from 2003 through 2008, as shown in Figure 2. Colorado ranks fourth among American states in per capita use of cannabis, with 9.24 percent of residents using cannabis in the preceding thirty days. As shown in Figure 3, the estimated percentage of Coloradoans who had initiated marijuana use does appear to have accelerated among 18 to 25 year olds from 2006 to 2008, but we do not know if the trend is significant. More suggestive, as shown in Figure 4, is the gradually eroding percentage of Coloradoans who perceived that smoking marijuana once a month posed a great risk over the period 2003 through 2008 (28). However, the Treatment Episode Data Set (TEDS) Report of Substance Abuse Treatment Admissions includes data through the year 2010. As shown in Figure 5, which summarizes the primary drug at admission to substance abuse treatment during the years 2004 to 2010, there was an increase in the percentage of Coloradoans entering substance abuse treatment that identified cannabis as their primary substance of abuse during 2010 (29). We present this data to suggest trends but acknowledge that additional data and analysis is required before significant observations can be made. The effect of medical marijuana on substance abuse and treatment in Colorado needs additional study, especially given the recent expansion of the medical marijuana registry and industry in the state, but appears to decrease the perception that smoking marijuana poses a great risk to health and may be associated with both increased use among 18 to 25 year old Coloradoans and increased percentages of the admissions to substance abuse treatment.

Unfortunately, Colorado has very limited substance abuse and mental health services, and those services are concentrated in the state's urban corridor. Among American states, Colorado ranks thirty-fifth in per capita mental health expenditures and fiftieth in the number of inpatient psychiatry beds, after losing 71 percent of its psychiatric hospital beds over the last two decades (30). Colorado's suicide rate has long ranked above the national average, but the CDPHE recorded a dramatic increase in 2009 with 940 suicides, a suicide rate of 18.4 deaths per 100,000 residents that is almost double the national average (31). As a state, Colorado has a high rate of substance abuse and a limited rate of services; the effects of medical marijuana on substance use, abuse, and treatment deserve rigorous investigation.

Crime and Education

Similarly, the effects of medical marijuana on crime and education remain unclear.

There have been several reports of crimes in which medical marijuana was involved, including two separate fatal car accidents in which the drivers appear to have been intoxicated on medical marijuana (32). The Colorado Department of Transportation reports that the percentage of the state's driving fatalities in which the driver was impaired by drugs increased every year between 2005 and 2009. By 2009, the Department of Transportation described 48 percent of the state's driving fatalities as impaired driving and says that in half of those fatalities, marijuana was the impairing substance (33). In response, the state's House of Representatives recently passed House Bill 1261, which limits drivers to no more than five nanograms of THC per millimeter of blood; a version of the bill is considered likely to become law later in 2011 (33).

Dispensaries themselves are associated with a number of crimes, but the nature of the association remains unclear. At this point, the evidence remains mostly anecdotal: reports of burglaries and homicides at dispensaries have featured prominently in the state's newspapers, but analyses by the Denver and Colorado Springs Police Departments found no significant difference in the incidence of crimes around dispensaries, and an analysis by *The Denver Post* even found a decrease in crime in the city's neighborhoods with the most dispensaries (34).

Authorities are increasingly concerned that dispensaries, and their associated grow operations, will divert marijuana to the criminal market. A registrant can possess up to two ounces of marijuana and up to six marijuana plants—three mature plants, three production plants. However, a mature plant can produce up

to a pound each. In February 2011, a South Dakota couple was arrested with ten pounds of marijuana, much of it labeled with the name of a Denver dispensary (35). Authorities have reported diversion of medical marijuana to the neighboring state of Nebraska (36).

With regards to the state's public school system, the Colorado Department of Education reported that during the 2009-2010 school year, the number of students suspended statewide for drug-related offenses spiked 31 percent from 3,202 to 4,205 in the year following the increased use of medical marijuana. Similarly, the number of students expelled statewide for drug-related offenses increased 40 percent from 534 to 749. While these are only associations, this rise in the expulsion rate ended a decade of declining expulsions for drug-related offenses (37).

We need additional data to better ascertain the relationships between the expanding use of medical marijuana and the state's criminal and education systems.

The Marijuana Patient-Physician Relationship

Less frequently acknowledged is how medical marijuana is altering the relationships between patients and physicians in Colorado. Unlike a traditional patient-physician relationship, where a physician has multiple responsibilities to a patient, in Colorado's medical marijuana system a physician was, until June 2010, responsible for simply "recommending" marijuana to a person whom they believed could benefit from its use. Marijuana remains a restricted Schedule 1 substance with limited evidence to suggest its indication, contraindication, dosage, and adverse effects. In this context, physicians willing to recommend marijuana seemingly ought to be extraordinarily scrupulous. However, the amendment requires only a diminished version of standard medical care. Physicians recommending marijuana are not required by the amendment to conduct a diagnostic examination, physical, mental, laboratory, or otherwise. Further, the amendment does not require coordination of care with a registrant's other physicians or even review of past records. Since enrollment on the medical marijuana registry is confidential, the information is excluded from the state's controlled substance monitoring program, which allows other physicians to see which controlled substances have been dispensed to a patient.

Dispensaries often advertise their relationships with recommending physicians, and some physicians see medical marijuana registry applicants in offices adjacent to or even within dispensaries. Under the original arrangement, physicians were often employed by a dispensary. They did not have to provide ongoing care or to be available if complications arose. Patients pay out-of-pocket for physician approval with advertised rates averaging $100 and the state registry fee of $90 (38). The medicalization of marijuana in Colorado includes a narrowed account of the relationship between a patient and a physician, in which a physician gives permission to use an otherwise illegal substance without the usual fiduciary responsibilities of a physician.

In this setting, a small number of entrepreneurial physicians have dominated the medical marijuana registry. According to data generated by the CDPHE in December 2010, 1,241 Colorado physicians had signed medical marijuana registry forms, but 911 of these physicians have signed fewer than six registry forms (11). In an update through the end of January 2011, the CDPHE found that of the approved medical marijuana registrations, 49 percent had been signed by one of fifteen physicians, and 10 percent of all registration forms in the state had been signed by a single physician, as illustrated in Figure 6 [personal communication, Apr 2011].

The identity of these frequent recommenders is confidential, and most members of this small group of physicians responsible for the majority of the recommendations to the state's medical marijuana registry have avoided publicity, but two physicians have had actions taken against their license in response to recommending medical marijuana. Dr. Paul Bregman, a radiologist who describes himself as an expert in depression and bipolar disorder, has spoken publicly about recommending medical marijuana (39). Dr. Bregman's license was briefly suspended in the last year for an undisclosed reason by the state's Medical Board but was recently reinstated (40). In addition, Dr. Manuel De Jesus Aquino surrendered his Colorado medical license in December 2010 after the office of the state's attorney general office filed a complaint for violating the state's Medical Practice Act. Dr. Aquino recommended marijuana to a twenty year old woman he saw at a dispensary without conducting an examination, taking a medical history, or counseling the young woman on the risks marijuana posed to her twenty-eight week pregnancy. The woman subsequently delivered a child who tested positive for marijuana, triggering the complaint against Dr. Aquino. Dr. Aquino first obtained his Colorado medical license in 2007. Before surrendering his license in February 2011, Dr. Aquino described his specialty as medical marijuana and his employer as a Denver-area dispensary (41).

To redress these situations, the governor signed Senate Bill 109, which regulates the marijuana patient-physician relationship, into law in June 2010. Senate Bill 109 requires physicians to take a complete medical history, to conduct an appropriate physical examination, and to be available for follow-up care. Physicians are now required to have valid, unrestricted licenses from both the DEA and the state of Colorado. Physicians who recommend medical marijuana are now prohibited from having an economic interest in a medical marijuana dispensary or grow operation and from being paid by a dispensary to write recommendations (42). As a result of these regulations, eighteen physicians who were specializing in medical marijuana were no longer allowed to recommend medical marijuana because they did not possess valid and unrestricted DEA and Colorado licenses (43). At least two of these physicians, Dr. Janet Dean and Dr. James Satt, have publicly complained that physicians with restricted licenses should

be allowed to recommend medical marijuana (44). Despite these regulations, the CDPHE recently reported to the authors that of the 36, 319 recommendations received from July 1, 2010 to January 31, 2011 (after the passage of Senate Bill 109), 49.3 percent of the recommendations were again from one of fifteen physicians [personal communication, Apr 2011].

While medical marijuana recommendations remain the province of a small group of entrepreneurial physicians, little is known about the physicians in the state who are recommending medical marijuana to a small number of patients as part of their regular practice. We are aware of surveys currently being conducted of these physicians, but no data is publicly available at this time. We look forward to learning more about the Colorado physicians who do and do not recommend medical marijuana.

Future Developments and Regulations

As Colorado's medical marijuana system continues to mature, we anticipate additional regulation and ballot initiatives, while hoping for additional research into the effects of medical marijuana on Colorado's communities with regards to substance abuse, mental health, education, and crime.

We discussed several of the state's regulatory efforts above, but the situation is changing rapidly. As part of the House Bill 1284 that was signed into law in June 2010, the state established a Medical Marijuana Enforcement Division within the Department of Revenue that will regulate the medical marijuana industry. These rules will be fully enforced beginning July 1, 2011 and will constitute the country's most stringent regulation of medical marijuana (45). We also anticipate more local regulation, which is allowed under House Bill 1284; as of this writing, thirty-two municipalities have banned medical marijuana dispensaries and industries (46).

Meanwhile, we expect additional citizen-initiated ballot measures. In 2006, marijuana advocates placed Amendment 44, which would have legalized possession of up to an ounce of marijuana by an adult twenty -one years or older without a medical marijuana card, on the ballot (47). While that measure was decisively defeated and possession of marijuana remains illegal in Colorado, several municipalities have decriminalized the possession of less than an ounce (48). Marijuana advocates are publicly discussing a new ballot initiative in 2012 that would amend the state's constitution to decriminalize the use and possession of marijuana, legalizing recreational use (49).

Finally, we hope our account reveals the need for high-level evidence on the use of medical marijuana, its effects on substance abuse and treatment, adolescent use, the education system, criminal behavior, and the relationships between patients and physicians.

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Conflict of Interest

I declare that I have no proprietary, financial, professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled Mile High Macaroons: The Medicalization of Marijuana in Colorado except for the following: employment at Denver Health.
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