LESSONS LEARNED FROM MARIJUANA LEGALIZATION IN FOUR U.S. STATES AND D.C.

MARCH 2018



Reviewed by researchers from: University of Colorado at Denver Johns Hopkins University Harvard Medical School Children's Hospital Boston University of Kansas and more

SAM Smart Approaches to Marijuana
preventing another big tobacco

www.learnaboutsam.org

SAM Smart Approaches to Marijuana

preventing another big tobacco

EXECUTIVE HIGHLIGHTS

Colorado and Washington legalized marijuana in 2012, followed by Alaska and Oregon in 2014. The District of Columbia legalized cultivation and possession in 2014.

Today's highly potent marijuana represents a growing and significant threat to public health and safety, a threat that is amplified by a new marijuana industry intent on profiting from heavy use.

State laws allowing marijuana have, in direct contradiction to federal law, permitted this industry to flourish, influencing both policies and policy makers. While the consequences of these policies will not be known for decades, early indicators are troubling.

This report, reviewed by prominent scientists and researchers, serves as an evidence-based guide to what we currently observe in various states.

YOUTH AND SCHOOL IMPACTS

- Since Colorado, Washington, Oregon, Alaska, and the District of Columbia (Washington, DC) legalized marijuana, past-month use of the drug has continued to rise above the national average among youth aged 12–17 in all five jurisdictions (National Survey on Drug Use and Health [NSDUH], 2006-2017).
- Alaska and Oregon are leading the nation in past-year marijuana use among youth aged 12–17 (NSDUH, 2006-2017).
- Colorado currently holds the top ranking for first-time marijuana use among youth, representing a 65% increase in the years since legalization (NSDUH, 2006-2017).
- Young adult use (youth aged 18–25) in legalized states is increasing (NSDUH, 2006-2017).
- Colorado toxicology reports show the percentage of adolescent suicide victims testing positive for marijuana has increased (Colorado Department of Public Health & Environment [CDPHE], 2017).
- In Anchorage, school suspensions for marijuana use and possession increased more than 141% from 2015 (when legalization was implemented) to 2017 (Wohlforth, 2018).
- A study in Colorado found that about 50% of youth in outpatient substance abuse treatment reported using diverted marijuana (Wilkinson, Yarnell, Radhakrishnan, Ball, & D'Souza, 2016).

SELLING TO MINORS



• Washington state law enforcement has documented a total of 424 violations among licensed marijuana businesses. Of these, 288 violations pertained to selling marijuana to minors and 136 violations were for allowing minors access to a restricted area (Washington State Liquor and Cannabis Board [WSLCB], 2017).

• In December 2017, the Oregon Liquor Control Commission conducted a random inspection of 66 licensed marijuana retailers and found that 16 of the businesses were selling marijuana to minors (Oregon Liquor Control Commission [OLCC], 2018).



SOCIAL JUSTICE



• Washington, DC, saw public consumption and distribution arrests nearly triple between the years 2015 and 2016. A disproportionate number of those marijuana-related arrests occurred among African-Americans (Moyer, 2017; District of Columbia Metropolitan Police Department [DCMPD], 2016).

• Colorado marijuana arrests for young African-American and Hispanic youth have increased since legalization (Colorado Department of Public Safety [CDPS], 2016).

• Colorado schools that had 25% or fewer youth of color had 313 marijuana-related suspensions compared to 658 marijuana-related suspensions for schools comprised of populations with 76% or more youth of color (CDPS, 2016).

ALCOHOL CONSUMPTION NOT DECREASING

- Researchers from Oregon State University found that college students under the age of 21 who are binge drinkers have been one of the primary groups of marijuana users after legalization (Darling, 2017).
- The gallons of alcohol consumed in Colorado since marijuana legalization has increased by 8% (Colorado Department of Revenue [CDR], Colorado Liquor Excise Tax, 2017).

HOSPITAL AND ER VISITS

- In Colorado, calls to poison control centers have risen 210% between the four-year averages before and after recreational legalization (Rocky Mountain Poison and Drug Center [RMPCD], 2017 and Wang et al., 2017). Washington has seen a 70% increase in calls between the three-year averages before and after legalization (Washington State Office of Financial Management [WSOFM], 2017).
- In Colorado, the annual rate of marijuana-related emergency room visits increased 35% between the years 2011 and 2015 (CDPHE, 2017).
- Central Oregon hospitals saw a nearly 2,000% increase in emergency room visits due to marijuana poisoning, with 434 marijuana-related emergency visits in January 2016 alone, compared to a maximum of 32 visits per month prior to legalization (Kent, 2016).
- One hospital in Bend, Oregon, also had an increase in marijuana-related emergency room visits from 229 in 2012 to 2,251 in 2015; the average number of marijuana-related emergency room visits per month in the same hospital in 2016 was 552 (Hawryluk, 2017).

COSTS RELATED TO HIGHLY POTENT TETRAHYDROCANNABINOL (THC) BURNS

According to the Oregon Burn Center, Butane Hash Oil explosions have resulted in at least 30 burn victims between July 2015 to July 2016, costing about $5,154,202 in total treatment costs (Oregon State Police-Drug Enforcement Section [OSPDES], 2017).

THE BLACK MARKET

- Narcotics officers in Colorado have been busy responding to the 50% increase in illegal grow operations across rural areas in the state (Stewart, 2017).
- In 2016 alone, Colorado law enforcement confiscated 7,116 pounds of marijuana, carried out 252 felony arrests, and made 346 highway interdictions of marijuana headed to 36 different U.S. states (RMHIDTA, 2017).
- The U.S. mail system has also been affected by the black market, seeing an 844% increase in marijuana seizures (RMHIDTA, 2017).
- A leaked police report in Oregon revealed that at least 70% of marijuana sales in 2016 were on the black market and around three to five times the amount of marijuana consumed in Oregon leaves the state for illegal sales (Hughes, 2017; Associated Press, 2017, August 14; OSPDES, 2017).
- The U.S. Attorney in Oregon reported in 2018 that "Oregon has a massive marijuana overproduction problem," with 2,644 pounds of marijuana in outbound postal parcels and over $1.2 million in cash seized in 2017 alone (Williams, 2018).

CRIME

- The crime rate in Colorado has increased 11 times faster than the rest of the nation since legalization (Mitchell, 2017), with the Colorado Bureau of Investigation reporting an 8.3% increase in property crimes and an 18.6% increase in violent crimes (Colorado Bureau of Investigation [CBI], 2017).
    - A study funded by the National Institutes of Health showed that the density of marijuana dispensaries was linked to increased property crimes in nearby areas (Freisthler, Gaidus, Tam, Ponicki, & Gruenewald, 2017).
    - The Boulder Police Department reported a 54% increase in public consumption of marijuana citations since legalization (Boulder Police Department [BPD], 2017).
- In Alaska, misdemeanor and vehicle thefts have dramatically increased since legalization. Alaska's national ranking for larceny moved up from 16th to 2nd and motor vehicle theft from 16th to 5th after marijuana became legal (Alaska Department of Public Safety [ADPS], 2016).
- Oregon's national ranking went from 17th to 11th for property crime, 12th to 7th for larceny, and 13th to 8th for motor vehicle theft, from 2014 to 2016, respectively. (Disaster Center, n.d.).

THE WORKPLACE

- Marijuana urine test results in Washington and Colorado are now double the national average (Quest Diagnostics, 2016).
- Insurance claims have become a growing concern among companies in legalized states (Hlavac & Easterly, 2016).

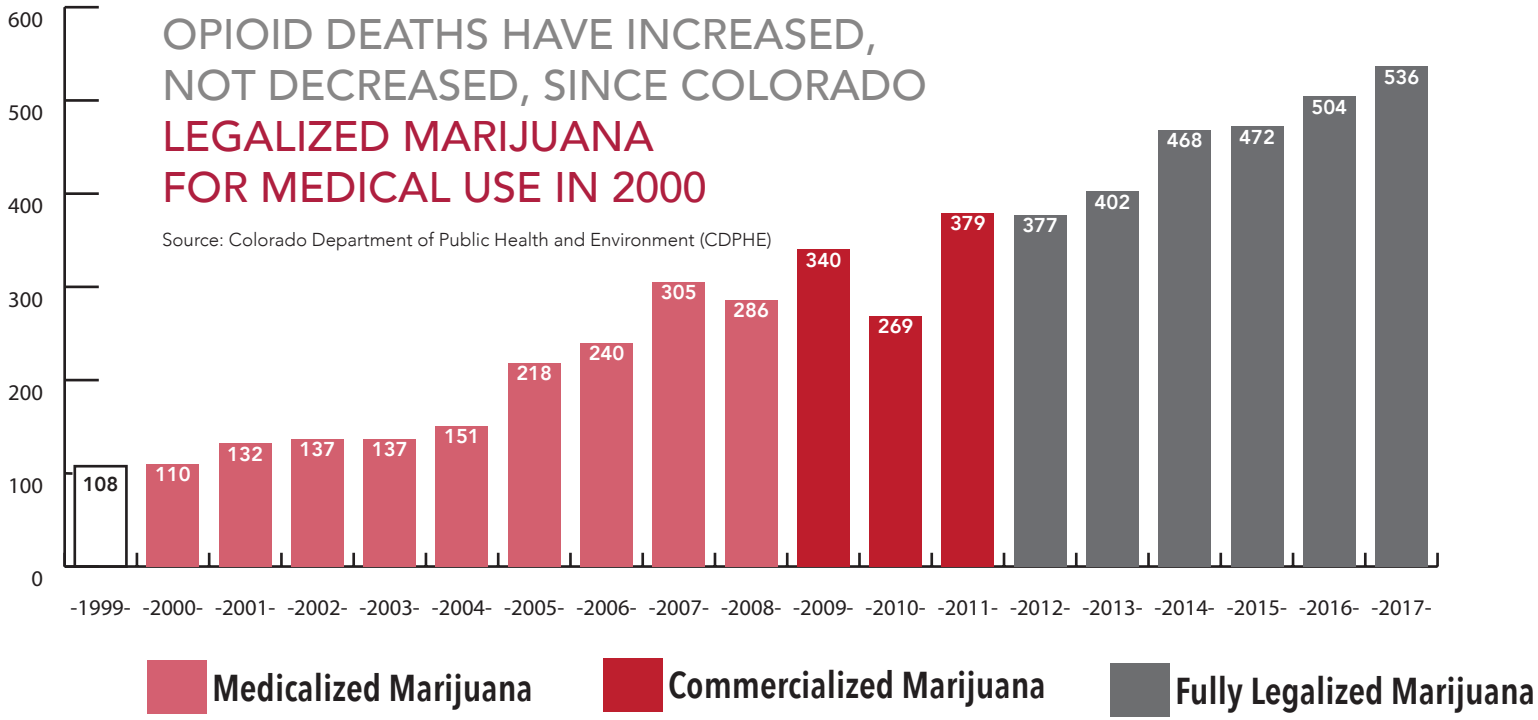
IMPAIRED DRIVING

- The number of drivers in Colorado intoxicated with marijuana and involved in fatal traffic crashes increased 88% from 2013 to 2015 (Migoya, 2017). Marijuana-related traffic deaths increased 66% between the four-year averages before and after legalization (National Highway Traffic Safety Administration [NHTSA], 2017).
    - Driving under the influence of drugs (DUIDs) have also risen in Colorado, with 76% of statewide DUIDs involving marijuana (Colorado State Patrol [CSP], 2017).
- Washington State experienced a doubling in drugged driving fatalities in the years following legalization (T. Johnson, 2016).
- In Oregon, 50% of all drivers assessed by drug recognition experts (DRE) in 2015 tested positive for THC (OLCC, 2015).

MARIJUANA POLICY SINCE 2012

In 2012, Colorado and Washington voters passed referendums legalizing marijuana, accelerating the growth of a multibillion dollar, addiction-for-profit industry, and causing negative impacts both inside and outside of those states. We now have five years of data, lessons learned, and negative impacts affecting both families and communities.

The goal of the industry is to successfully convert young, casual users into heavy, more frequent users. Given this nation's addiction epidemic—deaths driven largely by opioids—the rise of lax legalization policies comes at an especially inopportune time. In the time that the opioid epidemic has increased, the percentage of marijuana users who are using the drug frequently has skyrocketed (Institute for Behavior and Health [IBH], n.d.). This is unsurprising, as peer-reviewed research has revealed early marijuana use more than doubles the likelihood of opioid use later in life (Secades-Villa, Garcia-Rodríguez, Jin, Wang, & Blanco, 2015; Olfson, Wall, Liu, & Blanco, 2017).



MARIJUANA POLICY SINCE 2012

Although the full picture resulting from legalization will not be clear for decades, we need not wait that long to understand some key consequences.

The states that have legalized marijuana have among the highest rates of marijuana use in the country. Other data show:

- Higher rates of marijuana-related driving fatalities.
- More marijuana-related emergency room visits, hospitalizations, and accidental exposures.
- Expansion of a lucrative criminal market.
- Increases in marijuana-related crimes and juvenile offenses.
- Increases in workplace problems, including labor shortages and accidents.

In 2013, the U.S. Department of Justice (DOJ) decided to take a hands-off approach toward legalization at the state level.

Officially, the DOJ stated it would only get involved if any of the eight requirements laid out in the Cole Memo were violated (for example, sales to minors or increases in drugged driving).

Unfortunately, according to the U.S. Government Accountability Office (GAO), the DOJ took no meaningful action even as states were routinely in violation of the Cole Memo (U.S. Government Accountability Office, 2015).

However, public health and safety departments and law enforcement agencies in the states where legalization has been in place the longest have produced primary data and impact reports that shine a light on how current marijuana policies are failing to protect the health of the general population (Northwest High Intensity Drug Trafficking Area [NHIDTA], 2016; RMHIDTA, 2017; WSOFM, 2017; Oregon Health Authority [OHA], 2016; Alaska Department of Public Safety [ADPS], 2016; Washington Traffic Safety Commission [WTSC], 2016; CDPS, 2016; OSPDES, 2017).

In 2018, guidance from the DOJ returned to pre-Cole Memo policies, signaling uncertainty for the future of the marijuana industry. Despite state votes, marijuana remains illegal at the federal level and state actors violating federal law are committing felonies and risking significant consequences.

ADVERSE EFFECTS ON HEALTH OUTCOMES

As commercialization increases in legalized states, false advertising of marijuana products as being "natural" and "healthier than alcohol and tobacco" have greatly decreased the perceived risk of harm related to marijuana use. The main psychoactive ingredient in marijuana, THC, has now been observed to cause many different types of mental and physiological health problems—especially in children and youth.



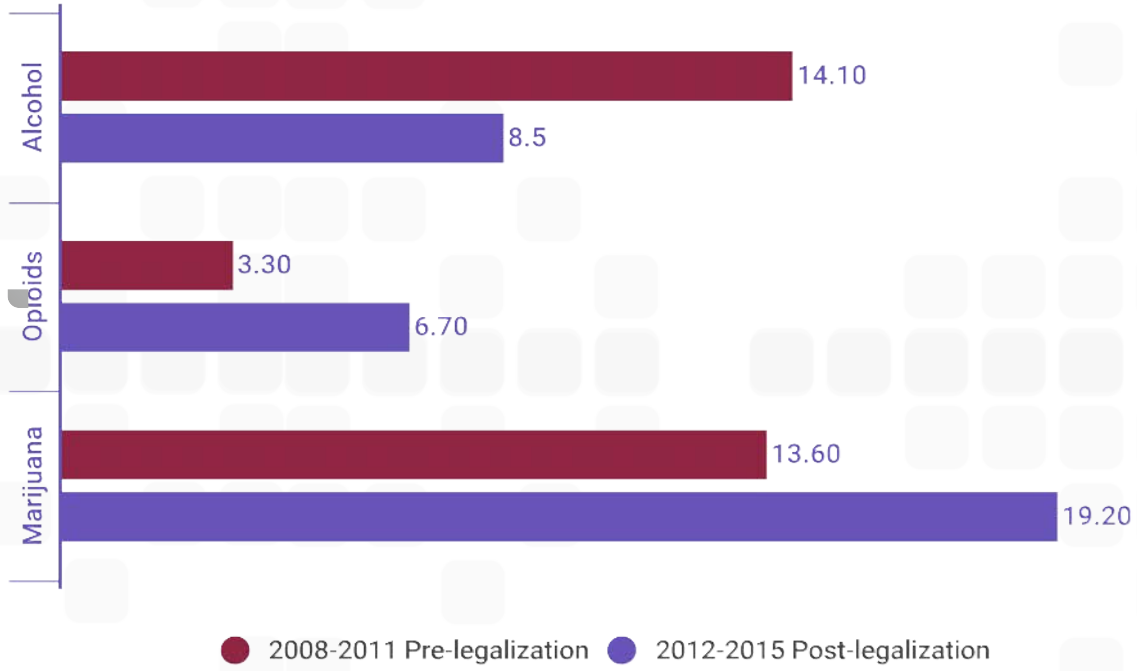
Direct associations have been made between the frequency of marijuana use and higher THC potency with the development of mental health issues (psychosis, depression, anxiety, suicidality, reshaping of brain matter, and addiction) (Miller, in press; Fischer et al., 2017). Links to lung damage and serious cardiovascular problems have also been found (hypertension, myocardial infarction, cardiomyopathy, arrhythmias, stroke, and cardiac arrest) (Pacher, Steffens, Hasko, Schindler, & Kunos, 2017; Hall & Lynskey, 2016). Marijuana use during pregnancy has also been shown to negatively affect the cognitive development of children by increasing their risk of hyperactivity, impulsivity, and inability to focus (Wang et al., 2017; Huizink & Mulder, 2006).

Chronic adolescent marijuana use has been correlated with cognitive impairment and a decreased ability to do well in work or school (Finn, 2015; Meier, Hill, Small, & Luthar, 2015; Arria, Caldeira, Bugbee, Vincent, & O'Grady, 2015; Meier et al., 2012).

Marijuana has a variety of other interactions with mental health. While the popular view holds that marijuana is not addictive, brain scans of marijuana users show changes in the structure of the brain's reward center to be consistent with addiction (Gilman et al., 2014). Heavy users have also been clearly observed to have withdrawal symptoms (Hasin, Keyes, Alderson, Wang, Aharonovich, & Grant, 2008). In Colorado, marijuana is the second drug most often implicated in addiction treatment admissions, after alcohol (Colorado Department of Health Services [CDHS], Office of Behavioral Health, 2017). Furthermore, a number of studies have identified marijuana's role in the pathway to other substance abuse. For example, a groundbreaking study of over 30,000 Americans showed that participants who reported marijuana use in the previous year were 2.6 times more likely to abuse prescription opioids (Olfson et al., 2017). Colorado toxicology reports show the percentage of adolescent suicide victims testing positive for marijuana has increased (CDPHE, 2017). This is not terribly surprising, as daily marijuana use among youth who begin before the age of 17 significantly increases the risk of suicide attempts (Silins et al., 2014).

ADVERSE EFFECTS ON HEALTH OUTCOMES

AVERAGE TOXICOLOGY OF SUICIDES AMONG ADOLESCENTS AGES 10-19 YEARS OLD (WITH KNOWN TOXICOLOGY)



SOURCE: Colorado Department of Public Health and Environment (CDPHE), Colorado Violent Death Reporting System

COMMERCIALIZATION:
A GROWING CONCERN

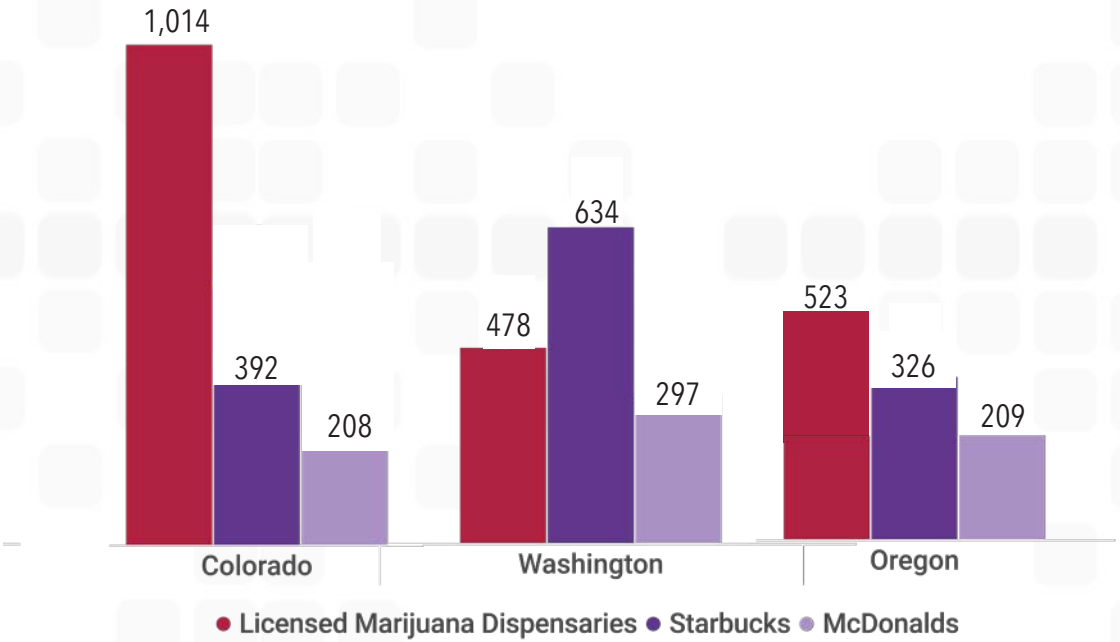
The rise of commercialization has inundated legalized communities with marijuana companies and paraphernalia.

In Colorado, this has led to more marijuana stores than McDonald's and Starbucks combined (1,014 retail marijuana outlets, with 394 of them being located with medical marijuana outlets, versus 600 McDonald's and Starbucks) (RMHIDTA, 2017; RMHIDTA, personal communication, January 25, 2018).

Although marijuana industry lobbyists claim that the mass commercialization of marijuana poses little threat to society, the evidence suggests there are a number of growing public health issues.

BUSINESS COMPARISON 2017

SOURCE: Colorado Department of Revenue; Starbucks Coffee Company, Corporate Office Headquarters; McDonalds Corporation, Corporate Office Headquarters; Washington State Liquor & Cannabis Board. Licensing. February 26, 2018. Information obtained from https://lcb.wa.gov/sites/default/files/publications/Public_Records/2017/MarijuanaApplicants.xls; Oregon Liquor Control Commission. http://www.oregon.gov/olcc/marijuana/Documents/Approved_Retail_Licenses.pdf



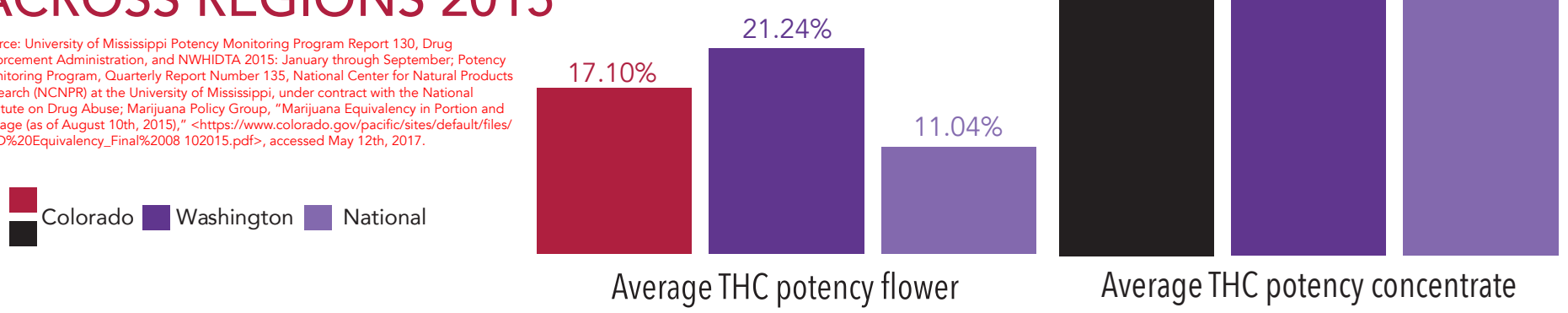
COMMERCIALIZATION: A GROWING CONCERN



The industry has prospered in selling marijuana-infused "edibles" that come in the form of cookies, candy, ice cream, sodas, and other sweet treats that are particularly appealing to children. These edibles comprise approximately 20 to 50% of the market in legalized states (where data is available), thereby increasing their availability to children and youth who are normally unaware of consumption serving sizes and consequences (Colorado Department of Revenue, 2015; O'Connor, Danelo, Fukano, Johnson, Law, & Shortt, 2016). The market for marijuana flower hybrids and concentrates continues to rise with the increase in demand for products with higher THC potency levels. In Seattle, Washington, the average THC potency level far exceeds the national average at 21.24% for marijuana flowers and 72.76% for marijuana concentrates (NHIDTA, 2016). And mislabeling is not uncommon. According to Soldotna, Alaska, Police Chief Peter Mlynarik, testing of marijuana products revealed discrepancies "… of up to 77% difference in THC potency in the samples provided" (P. Mlynarik, personal communication, January 19, 2018). All legal states have had numerous recalls due to poor labeling.

AVERAGE THC POTENCY ACROSS REGIONS 2015

Source: University of Mississippi Potency Monitoring Program Report 130, Drug Enforcement Administration, and NWHIDTA 2015: January through September; Potency Monitoring Program, Quarterly Report Number 135, National Center for Natural Products Research (NCNPR) at the University of Mississippi, under contract with the National Institute on Drug Abuse; Marijuana Policy Group, "Marijuana Equivalency in Portion and Dosage (as of August 10th, 2015)," <https://www.colorado.gov/pacific/sites/default/files/MED%20Equivalency_Final%2008 102015.pdf>, accessed May 12th, 2017.

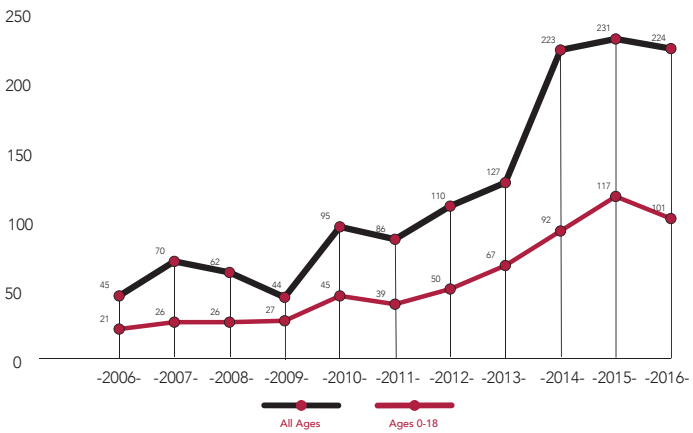


MARIJUANA-RELATED POISON CONTROL CALLS, HOSPITALIZATIONS, AND ER VISITS

The increase in marijuana availability due to legalization has led to increasing numbers of marijuana-related poison control calls, hospitalizations, and ER visits.

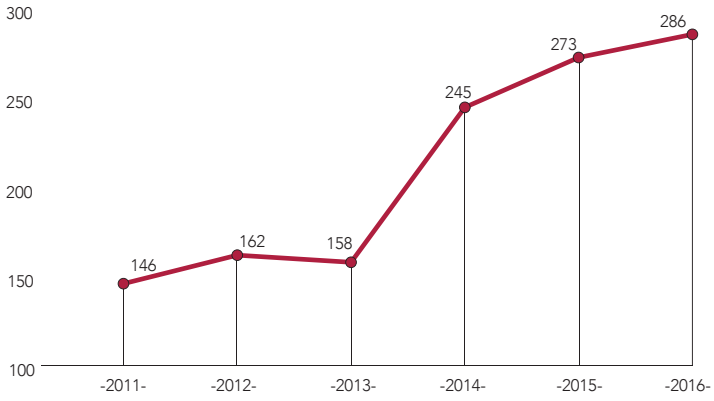
In Colorado, calls to poison control centers have risen 210% between the four-year averages before and after recreational legalization (RMPDC, 2017). Washington has seen a 70% increase in calls between the three-year averages before and after legalization (WSOFM, 2017).

Emergency Marijuana-Related Poison Control Calls in CO



Source: Rocky Mountain Poison and Drug Center Report, Colorado Marijuana Statistics for 2016, as reported by HIDTA

Emergency Marijuana-Related Poison Control Calls in WA



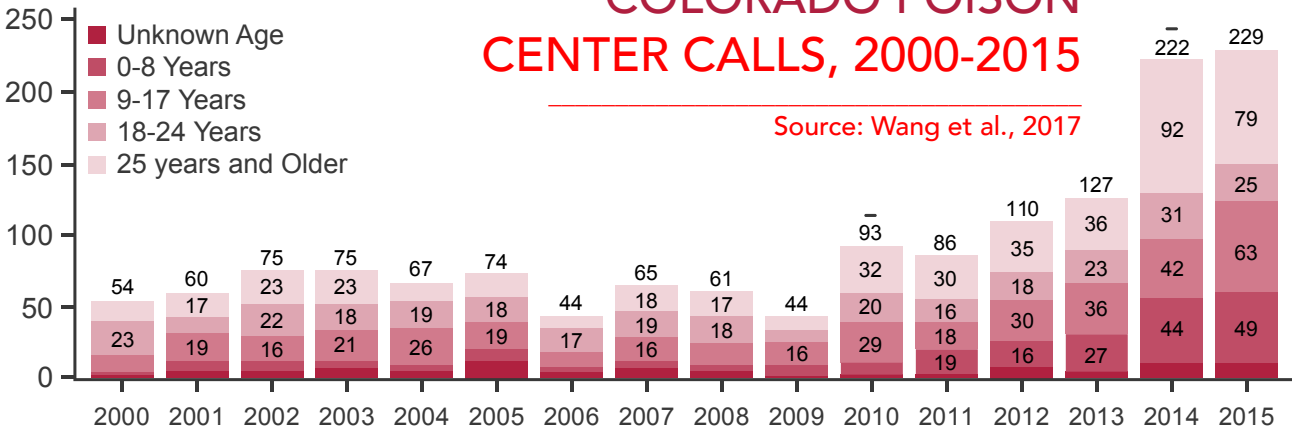
Source: Source: Washington Poison Control Center, Washington Poison Center Toxic Trends Report: 2016 Annual Cannabis Report

Marijuana-related emergency room visits have also surged since legalization. According to the Colorado Department of Public Health and Environment, the annual rate of marijuana-related emergency room visits increased 35% between the years 2011 and 2015 (CDPHE, 2016).

The burden on the emergency departments stemming from the type of patient care required and the resulting financial implications have been large for hospitals in Colorado (Finn, 2015).

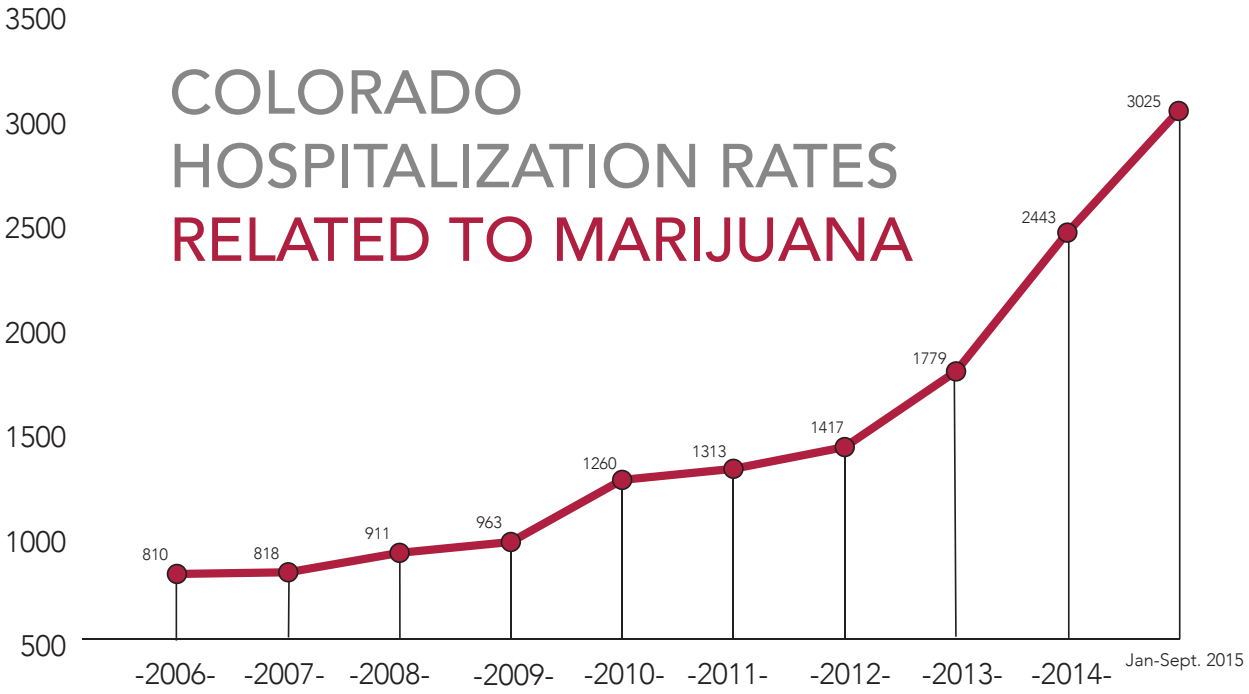
COLORADO POISON CENTER CALLS, 2000-2015

Source: Wang et al., 2017



Annual regional poison center human exposure calls related to marijuana from January 1, 2000 through December 31, 2015, divided by age groups. *Counts significantly increased from previous year with a p value <0.003. Unknown age includes calls with ages recorded as teens, 20s, unknown adult (≥ 20 yrs), unknown child (≤19 yrs),, and unknown age, Human marijuana exposure calls to RPC were determined by the presence of the generic code Marijuana – 0083000 from the National Poison Data System or marijuana exposure mentioned in RPC case notes.

COLORADO HOSPITALIZATION RATES RELATED TO MARIJUANA



Source: Colorado Department of Public Health and Environment, Monitoring Health Concerns Related to Marijuana in Colorado: 2016

MARIJUANA EMERGENCY ROOM VISITS HAVE ALSO INCREASED AMONG CHILDREN AND ADOLESCENTS

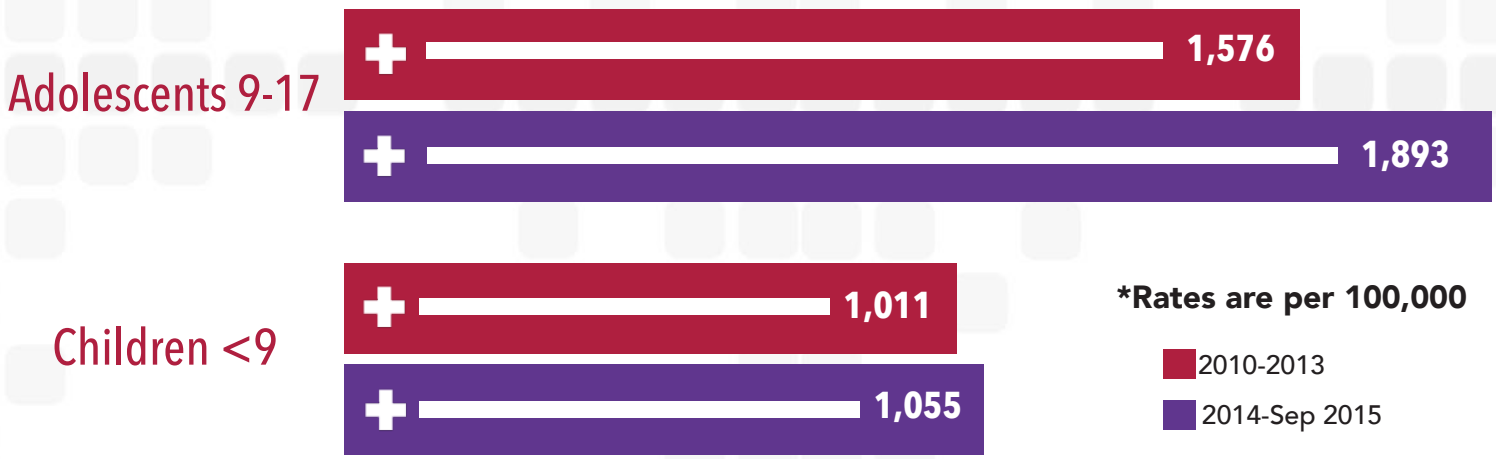
(CHA, 2016).

Central Oregon hospitals saw a nearly 2,000% increase in emergency room visits due to marijuana poisoning, with 434 marijuana-related emergency visits in January 2016 alone, compared to a maximum of 32 visits per month prior to legalization (Kent, 2016).

One hospital in Bend, Oregon, had an increase in marijuana-related emergency room visits from 229 in 2012 to 2,251 visits in 2015, while the average number of marijuana-related emergency room visits per month in the same hospital in 2016 was 552 cases (Hawryluk, 2017).

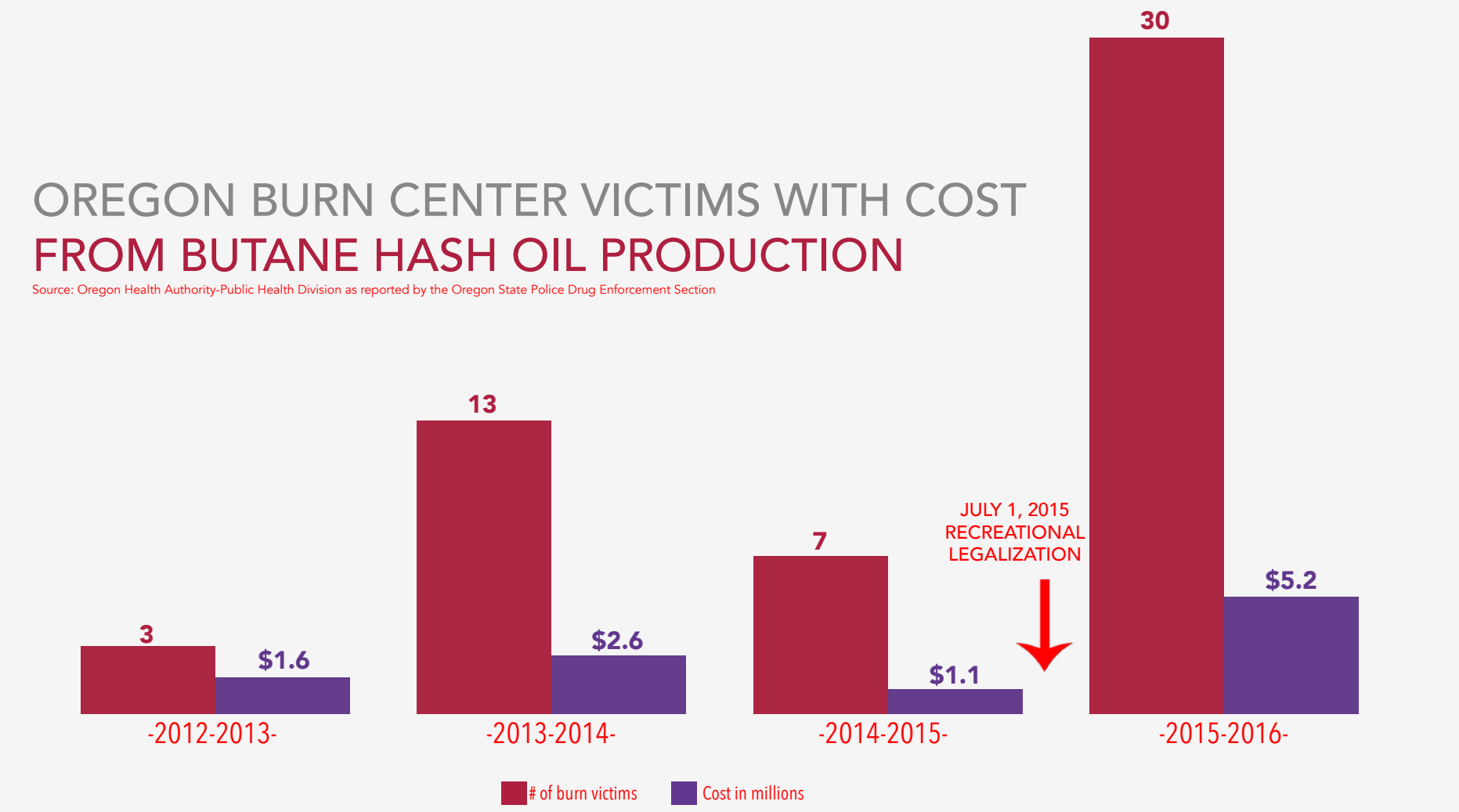
The increase in marijuana-related emergency room visits includes a growing number of Butane Hash Oil (BHO) burn victims. BHO is a marijuana concentrate that yields a THC potency of 70–99% and is highly lucrative. Production involves forcing raw marijuana and butane into a reaction chamber, which creates a highly combustible liquid that easily explodes when introduced to an ignition source. According to the Oregon Burn Center, BHO explosions have resulted in at least 30 burn victims between July 2015 to July 2016, costing about $5,154,202 in total treatment costs (OSPDES, 2017). In 2018, the U.S. Attorney in Oregon reported that Oregon production of BHO resulted in six separate lab explosions in the first half of 2017 (Williams, 2018). The Oregon State Police claims that the growth of BHO lab operations since legalization is "… arguably the most immediate cannabis threat facing the state." (OSPDES, 2017)

MARIJUANA RELATED EMERGENCY ROOM VISITS IN CO BY AGE



Source: Colorado Hospital Association 2011-Sep 2015 as reported in Monitoring Health Concerns Related to Marijuana in Colorado: 2016, Per 100,000

The increase in marijuana-related emergency room visits includes a growing number of Butane Hash Oil (BHO) burn victims. BHO is a marijuana concentrate that yields a THC potency of 70–99% and is highly lucrative. Production involves forcing raw marijuana and butane into a reaction chamber, which creates a highly combustible liquid that easily explodes when introduced to an ignition source. According to the Oregon Burn Center, BHO explosions have resulted in at least 30 burn victims between July 2015 to July 2016, costing about $5,154,202 in total treatment costs (OSPDES, 2017). In 2018, the U.S. Attorney in Oregon reported that Oregon production of BHO resulted in six separate lab explosions in the first half of 2017 (Williams, 2018). The Oregon State Police claims that the growth of BHO lab operations since legalization is "… arguably the most immediate cannabis threat facing the state." (OSPDES, 2017)

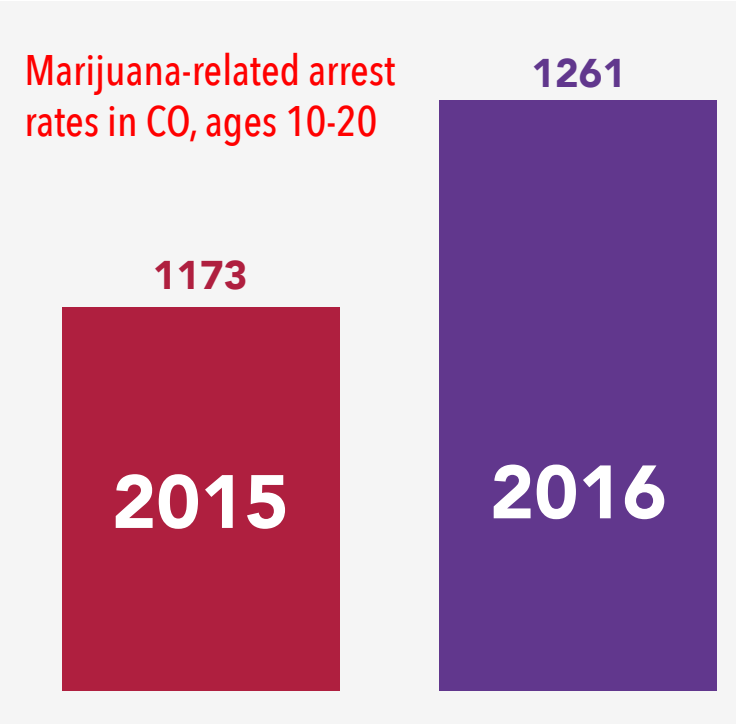


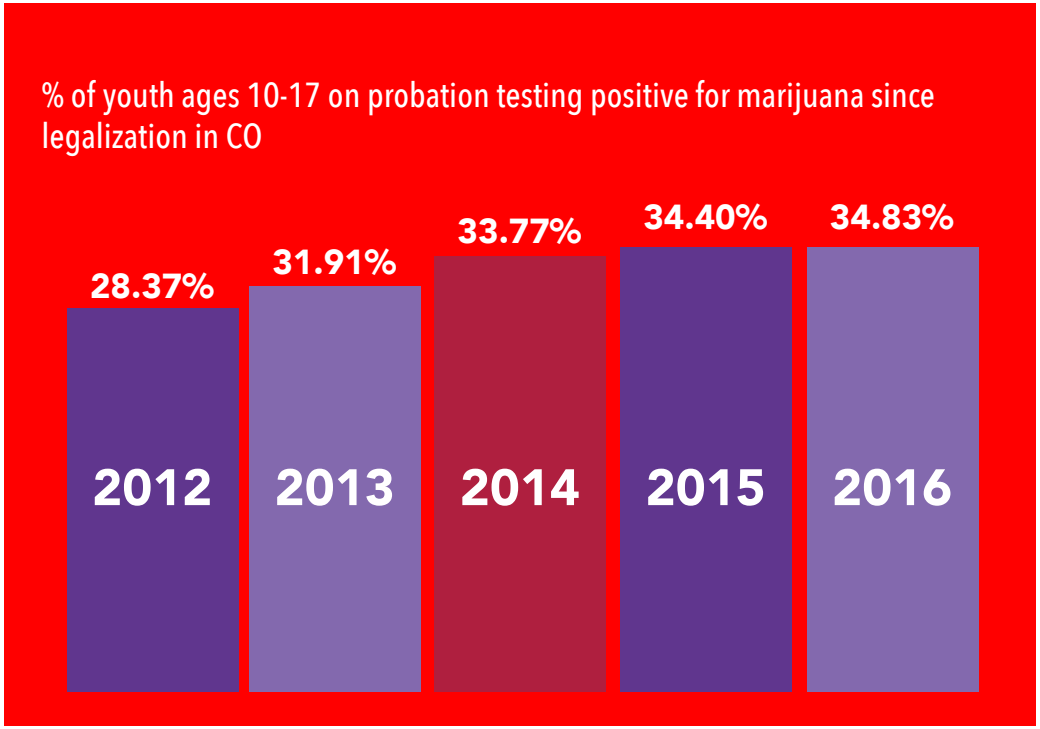
IMPACTS ON YOUTH AND YOUNG ADULTS

Since Colorado, Washington, Oregon, Alaska, and the District of Columbia allowed for marijuana, past-month use of the drug has continued to rise above the national average among youth aged 12–17 in all four states and Washington, DC.

Legalized states are leading the nation in past-year marijuana use among youth aged 12–17 (NSDUH, 2006-2016). **#1** Colorado currently holds the top ranking for first-time marijuana use among youth, representing a 65% increase in the years since legalization.

(NSDUH, 2006-2016). The number of youth arrested for marijuana increased from 2015 to 2016 (CBI, 2017), and the percentage of youth on probation testing positive for marijuana in Colorado has also increased each year since legalization (DPS, 2017).





IMPACTS ON YOUTH AND YOUNG ADULTS

Despite the claims of pot-industry lobbyists that legalization will not affect young adult and youth use, the data show people are radically increasing their rate of consumption (IBH, n.d.). One recent study showed increased use by 14–18 year olds with newer forms of consumption—vaping and edibles (Borodovsky, Lee, Crosier, Gabrielli, Sargent, & Budney, 2017). About 62% of Oregon 11th graders have reported "very easy" access to marijuana, with many of them reporting marijuana acquisition coming primarily from friends (OHA, 2016).

Additionally, marijuana dispensary density has been linked to more use among youth, with 16% of 11th graders reporting marijuana use in areas with less dispensary density compared to 23% of the same age group reporting use in more retail-dense areas (Hatch, 2017).

Another study conducted in Oregon found that as medical marijuana users and growers increased in a community, marijuana use among youth also increased, in part because of social acceptance of the drug (Paschall, Grube, & Biglan, 2017).

The most recognized survey on the prevalence of drug use among U.S. households is the National Survey on Drug Use and Health (NSDUH). According to NSDUH data, marijuana use in all four legalized states and the District of Columbia has continued to increase since legalization.

Unfortunately, state studies such as the Healthy Kids Colorado Survey (HKCS) have muddied the waters. This particular study has been rejected by the Centers for Disease Control and Prevention (CDC) due to its unsound methodology.

The study omits some of the largest counties in the state (e.g. Jefferson, Douglas, and El Paso counties) and has a standard of statistical significance set much higher than average, meaning only differences in use rates far greater than normal are recognized as significant (Murray, 2016).

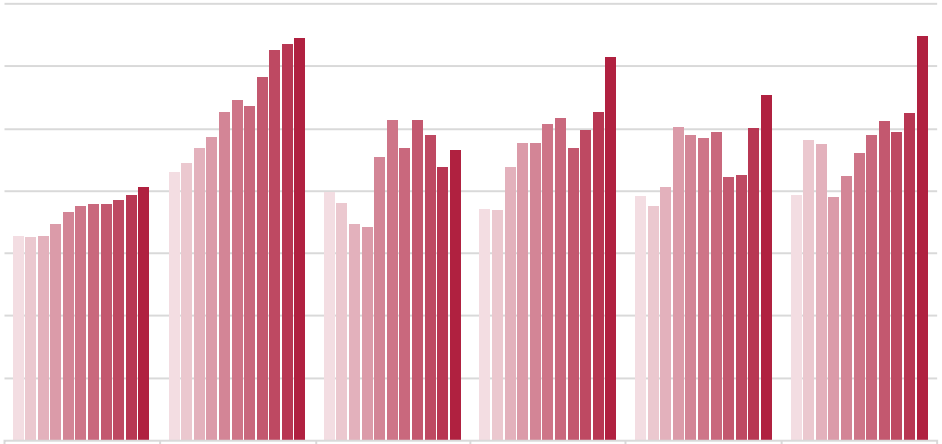
IMPACTS ON YOUTH AND YOUNG ADULTS

According to data from the NSDUH, the average rate of regular teen marijuana use in the legalized states of Alaska, Colorado, Oregon, and Washington is 30% higher than the U.S. rate as a whole (NSDUH, 2006-2017). Almost a third of all 18–25 year olds in legal states used marijuana in the past month, up from around one-fifth 10 years ago.

In Alaska, youth use is up more than 20% since before legalization. In Colorado, use among people 18 and over has increased, as well as use among young adults.

In Colorado in 2005–2006, 7.6% of 12–17 year olds used marijuana in the past month, compared to 9.1% currently (NSDUH, 2006-2017). While that number is lower than in recent years, we do not know how many of these users are heavy users. In Oregon, monthly use by youth is up since last year, and in Washington it is up since 2008–2009 (NSDUH, 2006-2017).

PAST MONTH MARIJUANA USE OF COLLEGE AGE 18-25 YEARS OLD



	U.S. average	Colorado	Washington	Oregon	Alaska	District of Columbia
2005-2006	16.42%	21.43%	20.052%	18.568%	19.544%	19.614%
2006-2007	16.34%	22.21%	19.055%	18.432%	18.813%	23.974%
2007-2008	16.45%	23.44%	17.336%	21.890%	20.278%	23.724%
2008-2009	17.42%	24.28%	17.194%	23.871%	25.157%	19.589%
2009-2010	18.39%	26.35%	22.740%	23.880%	24.460%	21.140%
2010-2011	18.78%	27.26%	25.560%	25.354%	24.307%	23.076%
2011-2012	18.89%	26.81%	23.444%	25.806%	24.774%	24.488%
2012-2013	18.91%	29.05%	25.555%	23.387%	21.062%	25.529%
2013-2014	19.32%	31.24%	24.468%	24.853%	21.301%	24.722%
2014-2015	19.70%	31.75%	21.867%	26.294%	25.020%	26.194%
2015-2016	20.30%	32.20%	23.30%	30.60%	27.65%	32.39%

2005-2006 2006-2007 2007-2008 2008-2009 2009-2010 2010-2011 2011-2012 2012-2013 2013-2014 2014-2015 2015-2016

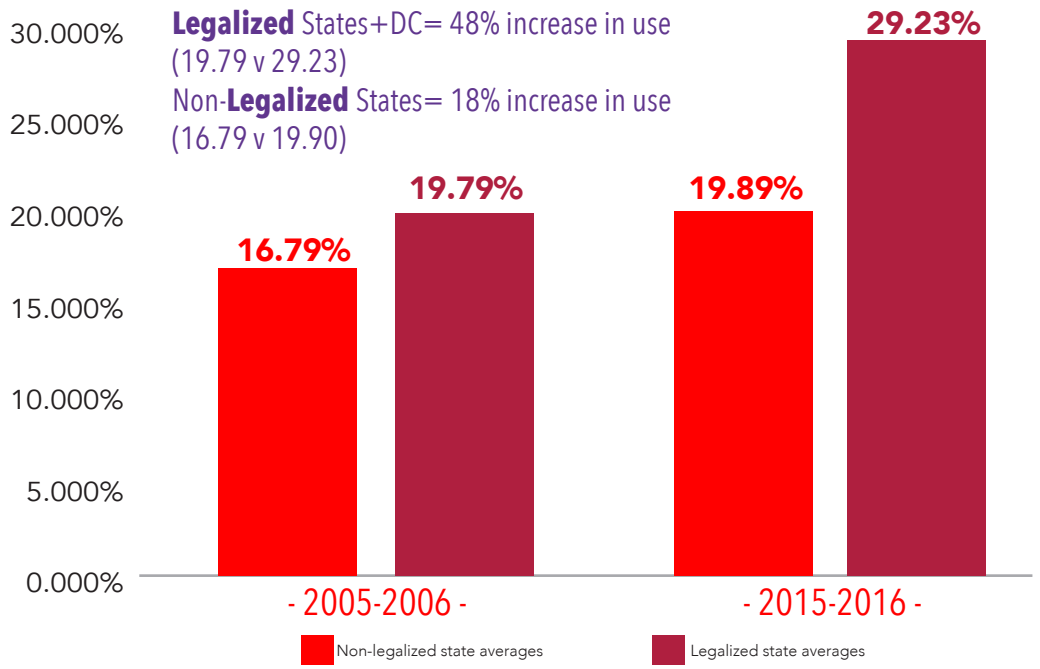
IMPACTS ON YOUTH AND YOUNG ADULTS

Some industry backers also claim that loosening marijuana laws will decrease alcohol use among consumers. But the opposite has been observed in legalized states.

The gallons of alcohol consumed in Colorado since marijuana legalization has increased 8% and the amount of alcohol consumed in Washington, Oregon, and Alaska has either remained constant or increased since legalization (Haughwout & Slater, 2017; CDR, 2017).

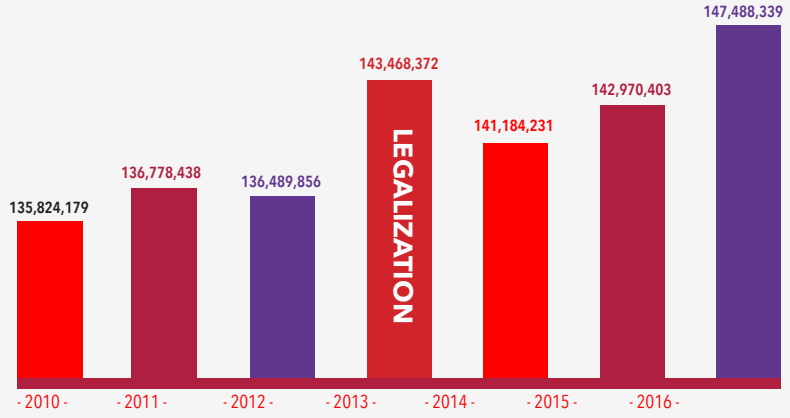
Furthermore, researchers from Oregon State University found that college students who are binge drinkers under the age of 21 have been one of the primary groups of marijuana users after legalization (Darling, 2017).

18-25 Year-Old Monthly Marijuana Use
Legal vs. Non-Legal State Averages



Source: NSDUH, 2017

GALLONS OF ALCOHOL CONSUMED IN CO, 2010-2016



Source: Colorado Department of Revenue, Colorado Liquor Excise Tax

BLACK MARKET ACTIVITY SINCE LEGALIZATION

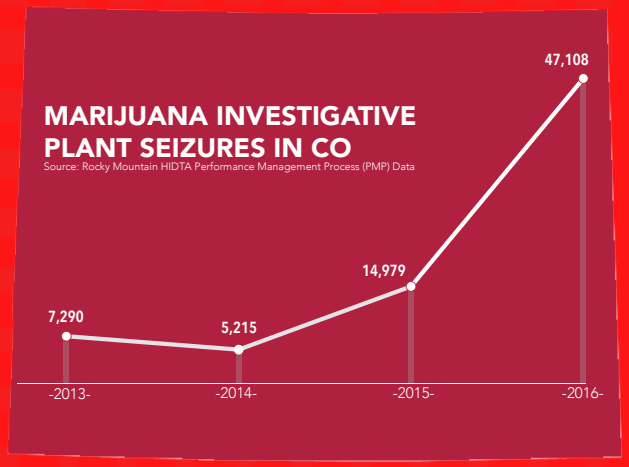
Commercialization advocates have long argued that legalization will reduce black market marijuana activity in legalized states. However, criminal activity has only been amplified as highway interdiction seizures and confiscation of illegal marijuana growing operations become increasingly common. A special media investigation revealed in 2018 that a record number of packages were mailed to or from Colorado through the U.S. Postal Service, up to 934 from 805 (Larson, 2018). The number was 234 in 2012.

In 2016 alone, Colorado law enforcement confiscated 7,116 pounds of marijuana, carried out 252 felony arrests, and made 346 highway interdictions of marijuana headed to 36 different U.S. states (RMHIDTA, 2017). The U.S. mail system has also been affected by the black market, seeing an 844% increase in postal marijuana seizures (RMHIDTA, 2017). Narcotics officers in Colorado have been busy responding to the 50% increase in illegal growing operations across rural areas in the state (Stewart, 2017).

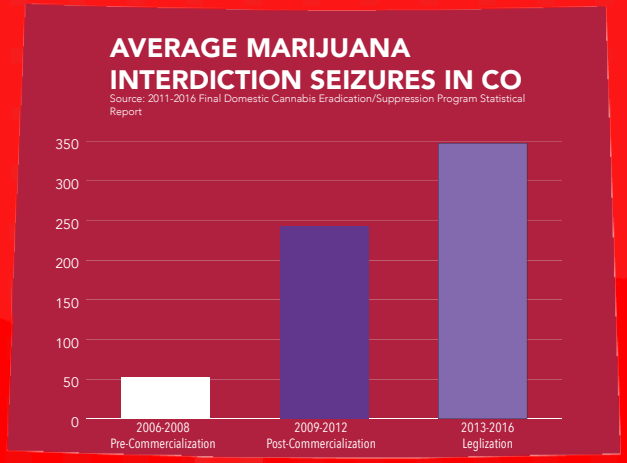
Legalization has made it easier for the black market to thrive in rural areas due to the difficulties involved in distinguishing between legal and criminal marijuana farms. About $6.5 million worth of illegal marijuana was confiscated by federal agencies in the White River National Forest in Aspen, Colorado, and 9,200 illegal marijuana plants were found growing on islands in the middle of the Colorado River (Associated Press, September 29, 2017; Roy, 2017). The ability to hide black market activity in legalized states has encouraged drug trafficking organizations (DTOs) and Mexican cartels to begin growing marijuana illegally within the United States and there is now a strong presence of cartel activity in Alaska (ADPS, 2016).

Oregon has been a hub of black market activity since legalization. A leaked police report in Oregon revealed that at least 70% of marijuana sales in 2016 were on the black market and around three to five times the amount of marijuana consumed in Oregon leaves the state for illegal sales (Hughes, 2017; Associated Press, 2017, August 14; OSPDES, 2017). The U.S. Attorney in Oregon reported in 2018 that "Oregon has a massive marijuana overproduction problem," with 2,644 pounds of marijuana in outbound postal parcels and over $1.2 million in cash seized in 2017 alone (Williams, 2018). In the last half of 2017, $1 million in cash linked to marijuana transactions was seized at Portland International Airport. Law enforcement across 16 states have reported marijuana seizures coming from Oregon (Williams, 2018). Lancaster County sheriff's deputies in Nebraska arrested a licensed marijuana processor from Oregon who was intending to distribute the 110 pounds of raw marijuana and 25 pounds of shatter (super high potency THC wax) in his vehicle (R. Johnson, 2017).

BLACK MARKET ACTIVITY
SINCE LEGALIZATION







STATES TO WHICH COLORADO MARIJUANA WAS DESTINED, 2016 (TOTAL REPORTED INCIDENTS PER STATE)



TRENDS IN CRIME SINCE LEGALIZATION

Apart from black market activity, legalization has potentially exacerbated other crimes as well. Though it cannot be said that crime has increased because of legalization, some trends are worth noting. The crime rate in Colorado has increased 11 times faster than the rest of the nation since legalization (Mitchell, 2017), with the Colorado Bureau of Investigation reporting an 8.3% increase in property crimes and 18.6% increase in violent crimes (CBI, 2017).

Along with the increase in property crimes, the Boulder Police Department has reported a 54% increase in marijuana public consumption citations since legalization (BPD, 2017).

According to Alaska law enforcement reports, misdemeanor and vehicle thefts have dramatically increased since legalization. Alaska's national ranking for property crimes moved from 21st to 3rd and burglaries from 31st to 14th after legalization. Alaska's national ranking for larcenies also moved up from 16th to 2nd and vehicle thefts from 16th to 5th after marijuana became legal (ADPS, 2016).

Since legalization in 2014 to 2016, Oregon's national ranking went from 17th to 11th for property crime, 12th to 7th for larceny, and 13th to 8th for motor vehicle theft (Disaster Center, n.d.).

MARIJUANA-RELATED CRIME AND OFFENSES SINCE LEGALIZATION

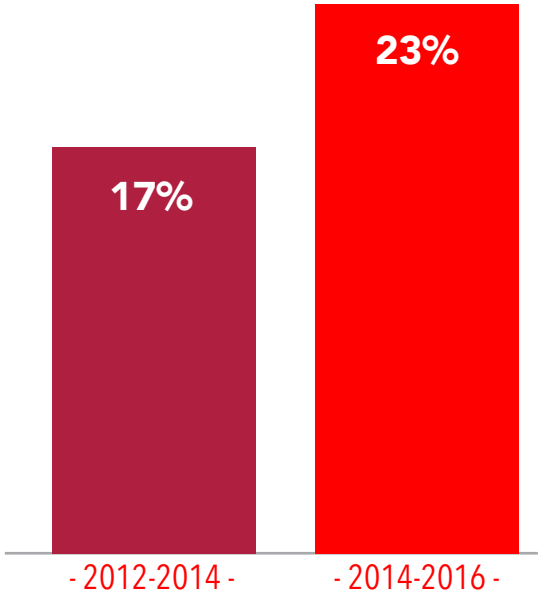
A link between looser laws and crime has been explored in the scientific literature. A study funded by the National Institutes of Health (NIH) showed that the density of marijuana dispensaries was linked to increased property crimes in nearby areas. Researchers found that Denver, Colorado, neighborhoods adjacent to marijuana businesses saw 84 more property crimes each year than neighborhoods without a marijuana shop nearby (Freisthler et al., 2017).

Many young people hear the message that "pot is legal," but are unaware (or unconcerned) that public use is not. In Anchorage, school suspensions for marijuana increased more than 141% from 2015 to 2017, after legalization was implemented. "Because it's legal in the community, I think, the stigma around marijuana use is decreasing," said Joe Zawodny, director of secondary education for the school district. "The data would seem to say there is increasing use" (Wohlforth, 2018).

Since 2012, the percentage of Colorado suspensions for marijuana has risen from 17% to 23%, and marijuana remains the top offense in school (Munoz et al., 2017).

% OF TOTAL STUDENT OFFENSES THAT ARE MARIJUANA-RELATED BY ACADEMIC YEAR IN CO

*Data encompasses all marijuana-related elementary, middle, and high school offenses occurring on school property or at school sponsored events.



Source: Munoz E, Flick P, Lucero L, English K. Summary of Law Enforcement and District Attorney Reports of Student Contacts: 2012-2014, 2014-2015, 2015-2016. Colorado Department of Public Safety.

MARIJUANA RELATED CRIME AND OFFENSES SINCE LEGALIZATION

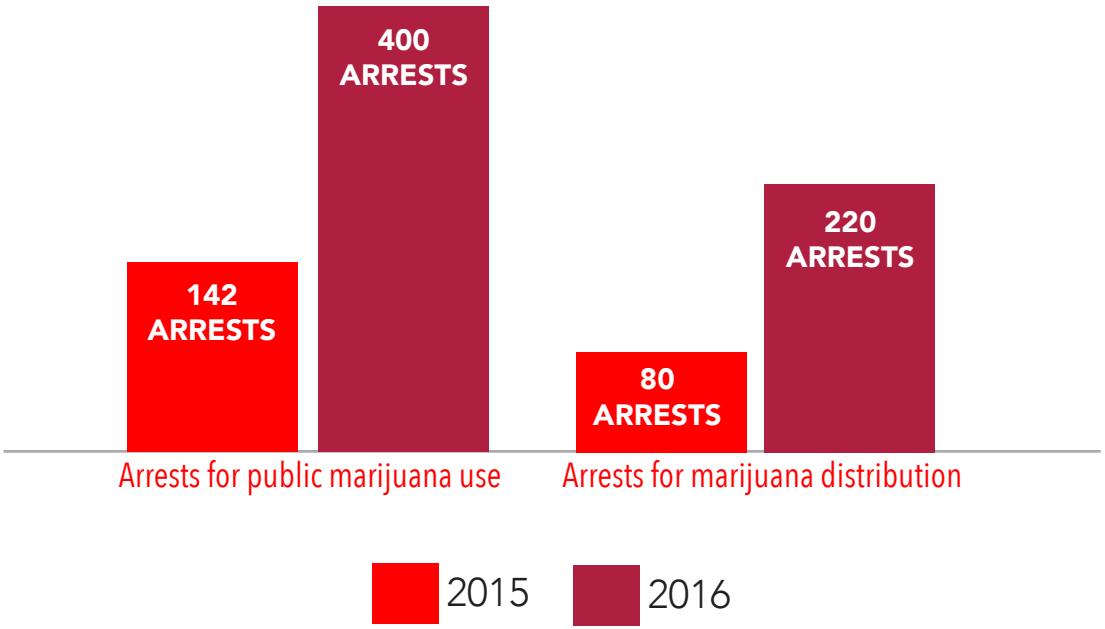
One hundred three (103) law enforcement agencies reported 6727 qualifying incidents in 554 public schools during the 2015-16 academic year, from August 1, 2015 through July 31, 2016.

CRIMES AND OFFENSES IN PUBLIC SCHOOLS, 2015-2016

OFFENSE	N	%	CUMULATIVE %
Marijuana (#1)	1561	23%	23%
Assault	834	12%	36%
Disorderly Conduct/ Fighting	814	12%	48%
Public Peace	666	10%	58%
Dangerous Drugs	420	6%	64%
Larceny/Theft	341	5%	69%
Liquor/Alcohol	297	4%	73%
Tresspass	260	4%	77%
Obstruct	206	3%	80%
Harassing Communication	203	3%	83%
Other/Unclear	194	3%	86%
Weapon Offense	141	2%	88%
Tobacco	127	2%	90%
Damage Property	120	2%	92%
Traffic Offense	91	1%	93%
Sexual Assault/Offense	76	1%	94%
Warrant	57	1%	95%
Criminal Mischief	47	1%	96%
Runaway/ Missing Person	41	1%	97%
Interference with Educ Inst	39	<1%	97%
Truancy	36	<1%	98%
Burgary	33	<1%	98%
Menacing	26	<1%	99%
Arson	25	<1%	99%
Robbery	20	<1%	99%
Curfew	16	<1%	100%
Family/Child Offense	12	<1%	100%
Vehicle Theft	8	<1%	100%
Fraud/Forgery	5	<1%	100%
Kidnapping	5	<1%	100%
Invasion of Privacy	2	<1%	100%
Total	6727	100%	100%

Source: Colorado Department of Public Safety, 2017

DISTRICT OF COLUMBIA ARRESTS FOR PUBLIC MARIJUANA USE & MARIJUANA DISTRIBUTION, 2015-2016



Source: Moyer JW. D.C. arrests for public use of marijuana nearly tripled last year. *The Washington Post*. July 11, 2017.

IMPACTS OF LEGALIZATION ON COMMUNITIES OF COLOR

As pro-marijuana lobbyists argue that marijuana legalization will increase social justice in legalized states, disparities among use and criminal offense rates continue among race, ethnicity, and income levels. The District of Columbia saw public consumption and distribution arrests nearly triple between the years 2015 and 2016, and a disproportionate number of those marijuana-related arrests occur among African-Americans (Moyer, 2017; DCMPD, 2016).

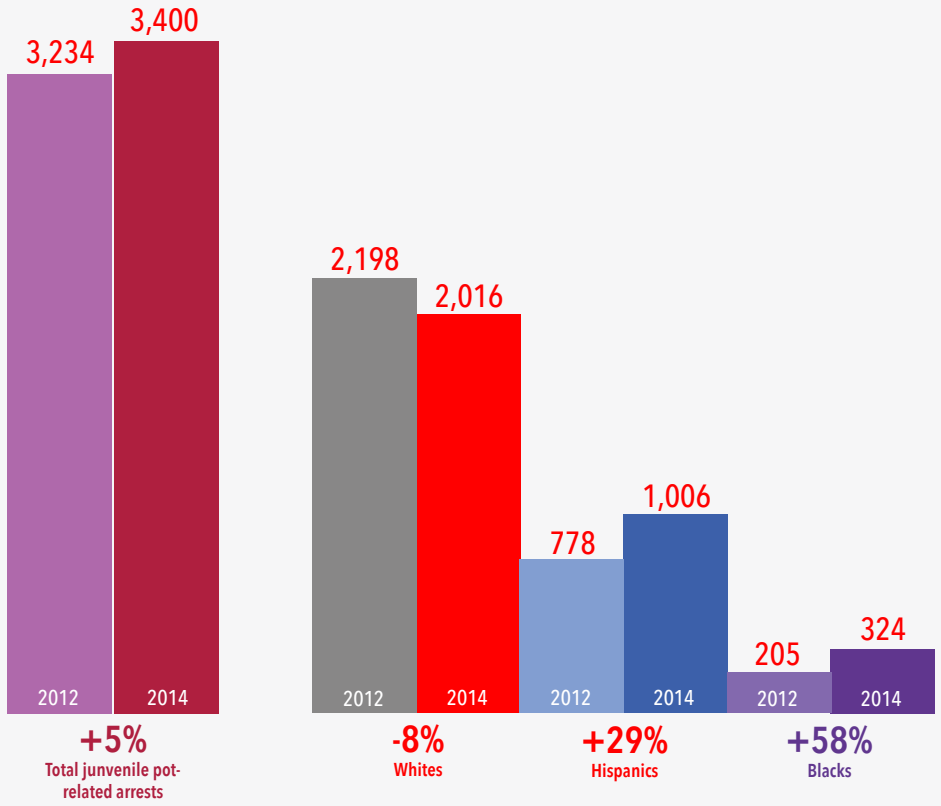
Colorado has seen a similar trend among its student population with the number of marijuana-related offenses in schools linked to the proportion of youth of color enrolled. Colorado schools that had 25% or fewer youth of color had 313 marijuana-related suspensions compared to 658 marijuana-related suspensions for schools comprised of populations with 76% or more youth of color (CDPS, 2016).

IMPACTS OF LEGALIZATION ON COMMUNITIES OF COLOR

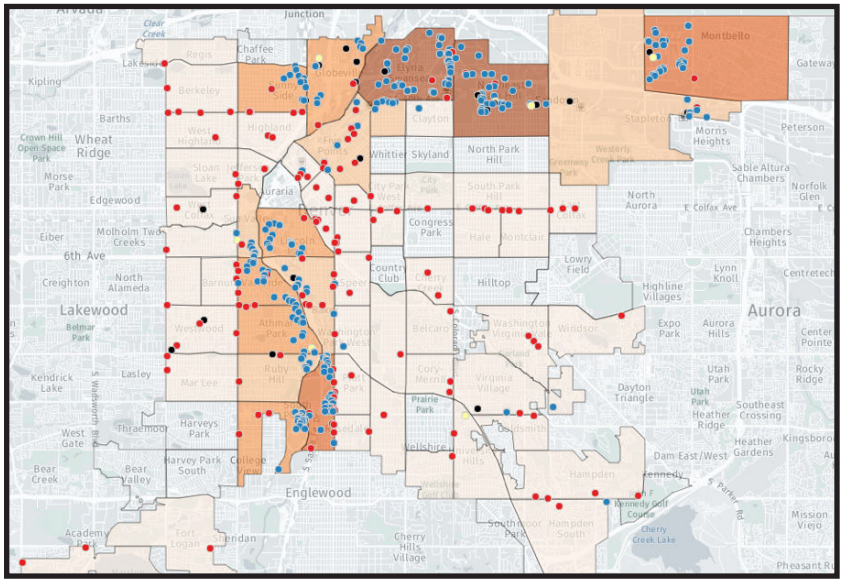
Furthermore, juvenile marijuana-related arrests have increased among African-American and Hispanic teens in Colorado after legalization. Between 2012 and 2014, the percentage of Hispanic and African-American arrests for teens under 18 years old increased 29% and 58%, respectivtely (CDPS, 2016). With the advent of legalization, communities of color are subject to disproportionate targeting by marijuana facilities. In Los Angeles, the majority of dispensaries have opened primarily in African-American communities (Thomas & Freisthler, 2017). An overlay of socioeconomic data with the geographic location of pot shops in Denver shows marijuana stores are located primarily in disadvantaged neighborhoods.

MARIJUANA-RELATED JUVENILE ARRESTS IN CO BY RACE/ETHNICITY, 2012-2014

Source: Colorado Department of Public Safety (March 2016)



IMPACTS OF LEGALIZATION ON COMMUNITIES OF COLOR AND LOW INCOME POPULATIONS



Marijuana legalization has touched on issues related to income. In Colorado, those with a household income below $25,000 had a 20% current-use rate compared to a 11% rate among households with income levels of $50,000 or greater (CDPS, 2016).

The National Survey on Drug Use and Health found that 28% of women living in low-income areas tested positive for marijuana use during pregnancy (Foeller & Lyell, 2017).

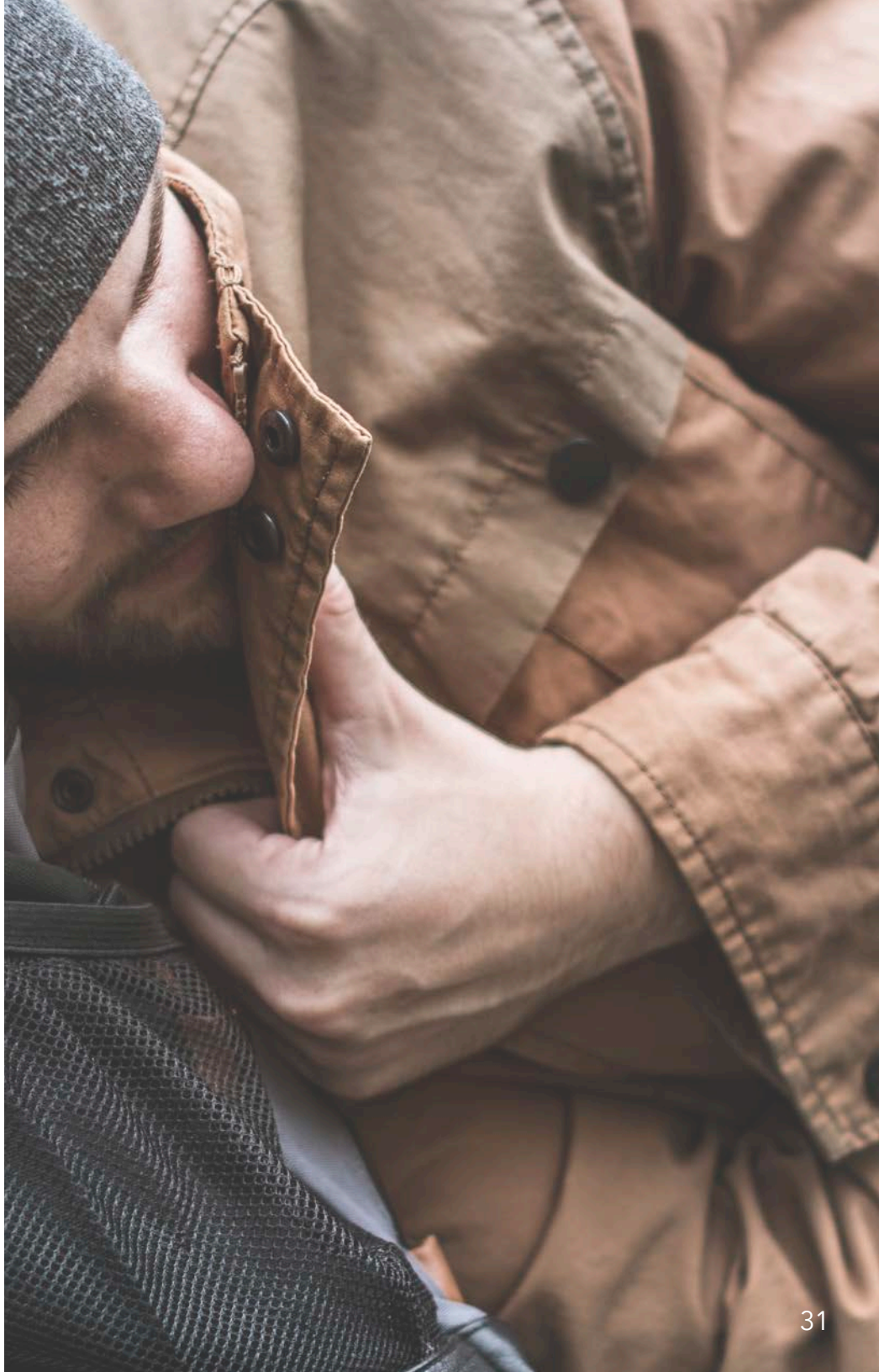
Another study by the American College of Obstetricians and Gynecologists reported that young women from lower income levels have a 15–28% rate of marijuana use during pregnancy. Up to 60% of these young women continue marijuana use throughout pregnancy due to a decreased perception of risk and stigma (American College of Obstetricians and Gynecologists, 2017).

IMPACT OF LEGALIZATION ON HOMELESSNESS

The easy availability of marijuana after legalization also appears to have a possible link to Colorado's growing homeless population. While overall U.S. homelessness decreased between 2013 and 2014 as the country moved out of the recession, Colorado was one of 17 states that saw homeless numbers increase during that time.

Perhaps not coincidentally, it was also when Colorado legalized "recreational-use" marijuana and allowed retail sales to begin. The U.S. Department of Housing and Urban Development reported a 13% increase in Colorado's homeless population from 2015 and 2016 (Acuna, 2017). That number may be low, as the rate of homelessness among Colorado children has increased 50% (Zubrzycki, 2016).

Business owners and officials in Durango, Colorado, testify that the resort town "suddenly became a haven for recreational pot users, drawing in transients, panhandlers, and a large number of homeless drug addicts" (Kolb, 2017).



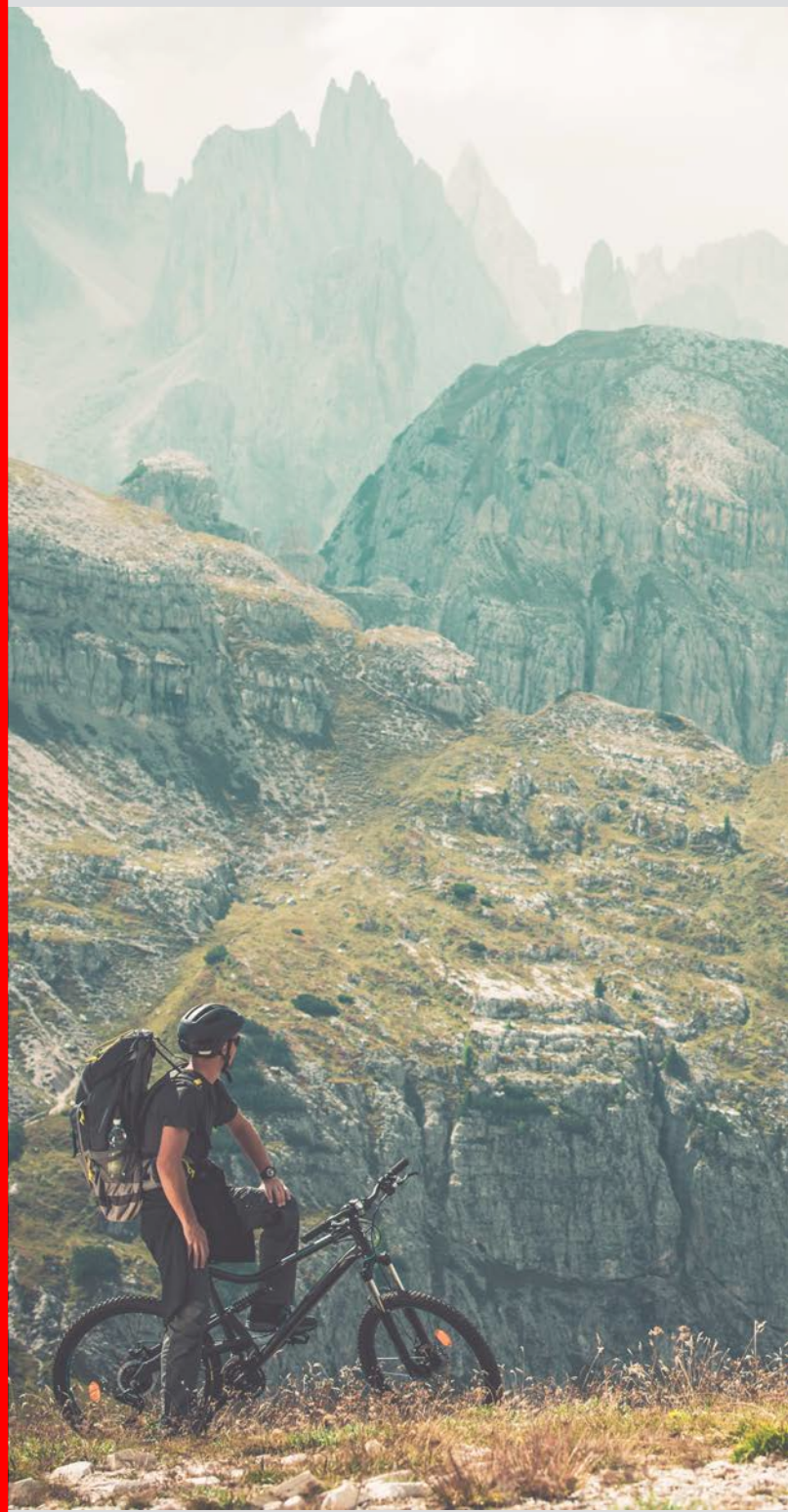
IMPACT OF LEGALIZATION ON THE ENVIRONMENT

Legalization and the industry it has created have caused irreparable damage to rainforests and other elements of the ecosystem. In California, farms generating marijuana crops have polluted plants and other natural life to the point of being hazardous to surrounding communities (Bernstein, 2017). Additionally, pollution caused by illegal grow sites has inflicted animal casualties. The poison used to reduce rodent population at farms has in turn killed large numbers of spotted owls, a species marked as "threatened" according to the Endangered Species Act (Chua, 2018).

The full effects of the industry on the natural environment are only beginning to be recognized. These impacts occur even under a so-called "regulated" environment, as the vast amounts of water and electricity needed to power marijuana farms are damaging to the environment.

Because the black market for marijuana in legalized states like Colorado has not abated, abuse and degradation of public lands from illegal grows has continued (Colorado Springs Gazette, 2015). For example, in 2015 the DOJ announced a wave of prosecutions on federal land resulting in seizure of 20,000 marijuana plants and over 300 kilograms of dried marijuana in Colorado. Suspects included Mexican nationals with ties to transnational criminal groups (U.S. Attorney's Office, 2015).

In 2017, four years after Colorado legalized pot, officials found more than 7,000 illegal plants on federal land in the San Isabel National Forest. It was the fifth illegal grow found in that area since the year legalization passed (Nicholson, 2017).





IMPACT OF LEGALIZATION ON THE ENVIRONMENT

Power consumption is a similar story. In 2012, marijuana growing consumed 1% of the nation's electricity, and since that time marijuana cultivation has expanded significantly. That is six times the amount of power the entire U.S. pharmaceutical industry uses and it can be expected to rise if cultivation and consumption continues to escalate due to legalization (Mills, 2012).

The energy to produce a single joint emits 3 pounds of carbon dioxide, which is comparable to leaving a TV on for over 15 hours (Agence France-Presse, 2015). This enormous energy use derives from both the quantity of marijuana grown and the large amount of energy it demands. Marijuana is almost four times more energy intensive than oil or coal (Mills, 2012).

It uses so much power that indoor marijuana production in Colorado is responsible for 2% of the state's electrical load and 45% of all new electricity demand coming online (Crombie, 2016). In fact, Mother Jones magazine indicated that the marijuana market "has placed a huge burden on the grid that distributes electricity throughout the state" (Mock, 2015).

IMPACT OF LEGALIZATION ON THE WORKFORCE

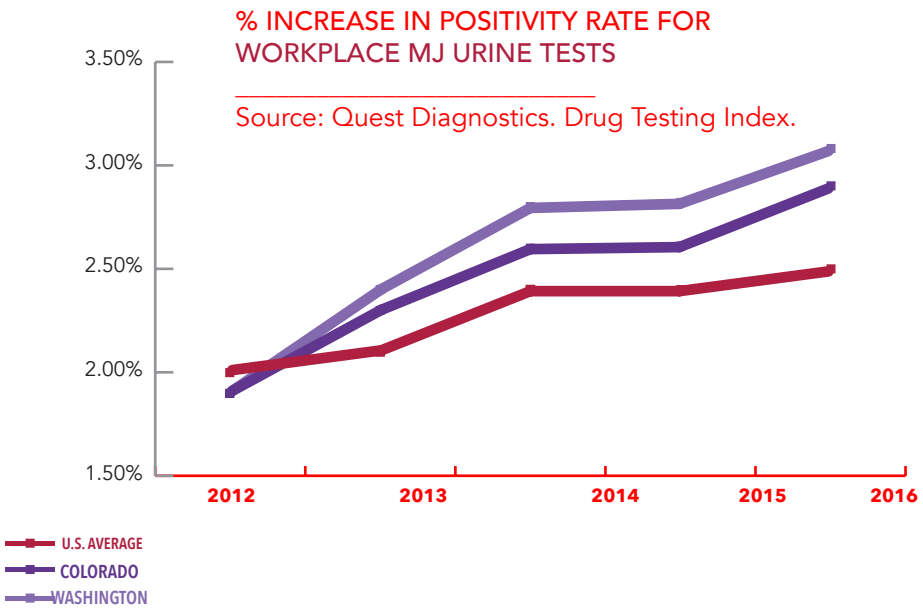
Marijuana legalization has had serious ramifications for businesses across legalized states. Increased marijuana availability and use has also increased the number of employees testing positive for marijuana in the workforce. In the 3-year period following legalization in Colorado and Washington (2013–2016), positive oral-fluid test results for marijuana use increased almost 75%, from 5.1 to 8.9 percent (Quest Diagnostics, 2016). Marijuana urine test results in Washington and Colorado are now double the national average (Quest Diagnostics, 2016).

This growing demand for marijuana has made it difficult to find employees who can pass a preemployment drug test. Colorado construction company GE Johnson was forced to hire out-of-state construction workers because too many Coloradans were failing preemployment drug tests ("Drug use a problem," 2015).

A study conducted in Washington during 2011–2014 found that the percentage of work-related injuries and illnesses was significantly higher (8.9%) among marijuana users than non-users (Marcum, Chin, Anderson, & Bonauto, 2017).

Insurance claims have become a growing concern among companies in legalized states because if marijuana use is allowed or drug testing ignored, employers are at risk of liability claims when a marijuana-related injury or illness occurs onsite (Hlavac et al., 2016).

The issue is further complicated by pro-marijuana advocates who are pushing to eliminate workplace drug testing policies—essentially stating that regardless of the outcome, employees should be permitted to use marijuana without the risk of professional consequences.



DRUGGED DRIVING

Drugged driving and motor vehicle fatalities have increased in states that have legalized recreational marijuana. According to a 2014 report by the Fatality Analysis Reporting System (FARS), about 50% of fatal crashes nationally involved drivers whose blood tests were positive for THC (WTSC, 2016). In states where marijuana is legalized, collision claims have also increased: the number of drivers in Colorado intoxicated with marijuana and involved in fatal traffic crashes increased 88% from 2013–2015 and marijuana-related traffic deaths increased 66% between the four-year averages before and after legalization (Highway Loss Data Institute, 2017; Migoya, 2017; National Highway Traffic Safety Administration (NHTSA), Fatality Analysis Reporting System (FARS), Colorado Department of Transportation, 2017).

According to AAA, Washington experienced a doubling in drugged-driving fatalities in the years following legalization (Johnson, 2016).

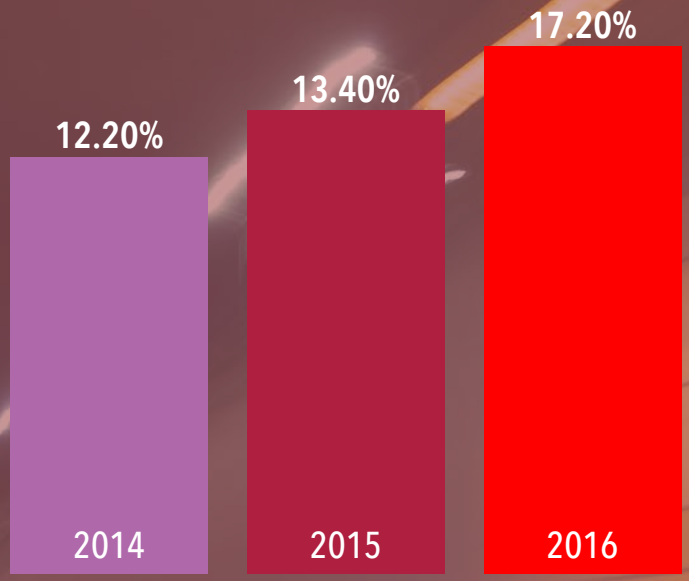
The percentage of marijuana offenses among those driving under the influence of drugs (DUIDs) have also risen in Colorado, with 76% of statewide DUIDs involving marijuana (CSP, 2017). When alcohol is added, the percentage number is 17%, a 25% increase since 2012.

In Oregon, 50% of all drivers assessed by DREs in 2015 tested positive for THC. Toxicology reports show that the rate of drivers testing positive for THC has increased at a consistent rate, resulting in an increase in THC-related impaired driving (OLCC, 2016). Unfortunatley, Alaska does not have reliable DUID data available.

While many factors contribute to pedestrian fatalities, it turns out that states that legalized marijuana for medical and/or recreational use saw a 16.4 percent surge in such deaths in the first six months of 2017 compared to the first six months of 2016, while nonlegal states saw a drop of 5.8 percent in pedestrian fatalities over the same time (Boudette, 2018).

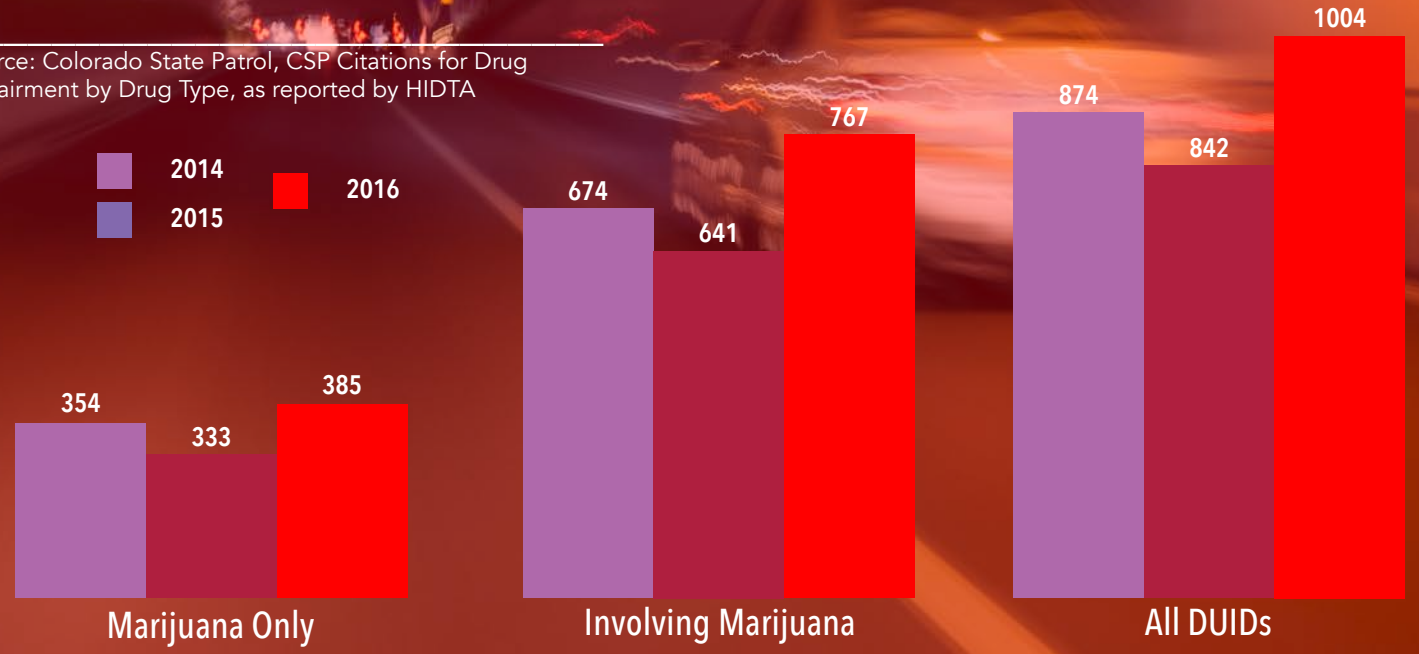
MARIJUANA AS A PERCENT OF ALL DUI AND DUIDS IN COLORADO

Source: Colorado State Patrol, CSP Citations for Drug Impairment by Drug Type, as reported by HIDTA



COLORADO STATE PATROL NUMBER OF DRIVERS UNDER THE INFLUENCE OF DRUGS (DUIDS)

Source: Colorado State Patrol, CSP Citations for Drug Impairment by Drug Type, as reported by HIDTA



RECOMMENDATIONS

Policy makers and the public need real-time data on both the consequences of legalization and the related monetary costs. Meanwhile, the industry's influence on policy should be significantly curtailed. SAM recommends research efforts and data collection focus on the following categories:

- Emergency room and hospital admissions related to marijuana.
- Marijuana potency and price trends in the legal and illegal markets.
- School incidents related to marijuana, including representative data sets.
- Extent of marijuana advertising toward youth and its impact.
- Marijuana-related car crashes, including THC levels even when testing positive for alcohol.
- Mental health effects of marijuana.
- Admissions to treatment and counseling intervention programs.
- Cost of implementing legalization from law enforcement to regulators.
- Cost of mental health and addiction treatment related to increased marijuana use.
- Cost of needing but not receiving treatment.
- Effect on the market for alcohol and other drugs.
- Cost to workplace and employers, and impact on employee productivity.

SAM Smart Approaches to Marijuana
preventing another big tobacco

ABOUT SMART APPROACHES TO MARIJUANA (SAM)

Comprising the top scientists and thinkers in the marijuana research and practice field, SAM works to bridge the gap between the public's understanding of marijuana and what science tells us about the drug. At the local, state, tribal, and federal levels, SAM seeks to align marijuana policy and attitudes about the drug with 21st-century science, which continues to show how marijuana use harms the mind and body. SAM argues against extremes in marijuana policy and opposes both incarceration for low-level use and blanket legalization, favoring instead a health-based approach to marijuana. Learn more at www.learnaboutsam.org.

SAM SCIENCE ADVISORS:

- **Hoover Adger,** MD—Professor of Pediatrics and Director of Adolescent Medicine, Johns Hopkins University
- **Judge Arthur Burnett**—National Executive Director, National African American Drug Policy Coalition
- **Eden Evins,** MD, MPH—Associate Professor of Psychiatry, Harvard Medical School
- **Stuart Gitlow,** MD, MPH, MBA—Past President, American Society of Addiction Medicine
- **Sion Harris,** PhD—Center for Adolescent Substance Abuse Research at Boston Children's Hospital
- **Marilyn Huestis,** PhD—Adjunct Professor, University of Maryland School of Medicine
- **Yifrah Kaminer,** MD—Professor of Psychiatry and Pediatrics, University of Connecticut and Injury Prevention Center at Connecticut Children's Medical Center
- **Sharon Levy,** MD, MPH—Assistant Professor of Pediatrics, Harvard Medical School
- **Kimber Richter,** MD, PhD—Professor of Preventive Medicine and Public Health, University of Kansas
- **Paula Riggs,** MD—Associate Professor of Psychiatry, University of Colorado Denver
- **Christine Miller,** PhD—Retired Neuroscientist, MillerBio and Johns Hopkins University
- **Christian Thurstone,** MD—Associate Professor of Psychiatry, University of Colorado
- **Krishna Upadhya,** MD, MPH—Assistant Professor of Pediatrics, Children's National Health System, Washington, D.C.
- **Kathryn Wells,** MD—Associate Professor of Pediatrics, University of Colorado Denver
- **Aaron Weiner,** PhD—Director of Addiction Services, Linden Oaks Behavioral Healthcenter, Naperville, IL

REFERENCE LIST

Acuna, A. (2017, July 10). Colorado tries to fight homeless problem that may have been triggered by pot law. Fox News. Retrieved February 3, 2018, from http://www.foxnews.com/us/2017/07/10/colorado-tries-to-fight-homeless-problem-that-may-have-been-triggered-by-pot-law.html

Agence France-Presse. (2015, November 27). Everyday actions that contribute to carbon dioxide emissions. ABS-CBN News. Retrieved February 3, 2018, from http://news.abs-cbn.com/focus/11/27/15/everyday-actions-that-contribute-to-carbon-dioxide-emissions

Alaska Department of Public Safety. (2016). Alaska state troopers annual drug report. Retrieved February 3, 2018, from https://dps.alaska.gov/getmedia/f259530b-5277-408e-9d45-4999958fe530/2016-Annual-Drug-Report-6-28-17final;.aspx

Alaska Department of Public Safety. (2016). Uniform Crime Reports, 2014–2016. Retrieved February 6, 2018, from https://dps.alaska.gov/Statewide/R-I/UCR American College of Obstetricians and Gynecologists. (2017). ACOG Committee Opinion Number 722, October 2017. Washington, DC: Author. Retrieved February 3, 2018, from https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Marijuana-Use-During-Pregnancy-and-Lactation

Arria, A. M., Caldeira, K. M., Bugbee, B. A., Vincent, K. B., & O'Grady, K. E. (2015). The academic consequences of marijuana use during college. Psychology of Addictive Behaviors, 29(3), 564–575. doi: 10.1037/adb0000108

Associated Press. (2017, August 14). Marijuana-legal states struggle with black-market weed. Los Angeles Daily News. Retrieved February 3, 2018, from https://www.dailynews.com/2017/08/14/marijuana-legal-states-struggle-with-black-market-weed/

Associated Press. (2017, September 29). Federal agencies raid pot grow operation in Aspen area. Denver News. Retrieved February 3, 2018, from https://www.usnews.com/news/best-states/colorado/articles/2017-09-29/federal-agencies-raid-pot-grow-operation-in-aspen-area

Bernstein, S. (2017, August 06). Toxic waste from U.S. pot farms alarms experts. Reuters. Retrieved February 3, 2018, from https://www.reuters.com/article/us-usa-marijuana-environment/toxic-waste-from-u-s-pot-farms-alarms-experts-idUSKBN1AM0C3

Borodovsky, J. T., Lee, D. C., Crosier, B. S., Gabrielli, J. L., Sargent, J. D., & Budney, A. J. (2017). U.S. cannabis legalization and use of vaping and edible products among youth. Drug and Alcohol Dependence, 177, 299–306. doi: 10.1016/j.drugalcdep.2017.02.017

Boulder Police Department, Records and Information Services. (2017). Retrieved February 6, 2018, from http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

Boudette, N. (Feb. 28, 2018). Where Pedestrian Deaths Are Up, Is Marijuana to Blame? New York Times. Retrieved on February 14, 2018 at https://www.nytimes.com/2018/02/28/business/pedestrian-deaths-marijuana.html

Chua, J. M. (2018, January 11). Owls dying near marijuana farms (here's why). Live Science. Retrieved February 3, 2018, from https://www.livescience.com/61403-marijuana-farms-dying-owls.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20180117-ls

Colorado Bureau of Investigation. (2017). National Uniform Crime Reports. Retrieved February 6, 2018, from https://www.colorado.gov/pacific/cbi/crime-colorado1

Colorado Department of Health Services, Office of Behavioral Health, 2005-2016. (2017). Retrieved February 6, 2018, from http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

Colorado Department of Public Health & Environment. (2016). As reported in Monitoring Health Concerns Related to Marijuana in Colorado. Retreived Jan 20, 2018 from https://www.researchgate.net/profile/Katelyn_Hall2/publication/316885353_Monitoring_Health_Concerns_Related_to_Marijuana_in_ Colorado_2016/links/591631b40f7e9b70f49dc1b2/Monitoring-Health-Concerns-Related-to-Marijuana-in-Colorado-2016.pdf

Colorado Department of Public Health & Environment, Colorado Violent Death Reporting System. (2017). Colorado Suicide Dashboard. Retrieved November 22, 2017, from https://cohealthviz.dphe.state.co.us/t/HSEBPublic/views/CoVDRS_12_1_17/Story1?:embed=y&:showAppBanner=false&:showShareOptions=true&:display_count=no&:showVizHome=no#4

Colorado Department of Public Safety. (2016). Marijuana legalization in Colorado: Early findings. Retrieved February 3, 2018, from https://cdpsdocs.state.co.us/ors/docs/reports/2016-SB13-283-Rpt.pdf

Colorado Department of Public Safety. (2017). Summary of Law Enforcement and District Attorney Reports of Student Contacts Pursuant to House Bill 15-1273. Prepared for the Education and Judiciary Committees of the Colorado State House and Senate. Retrieved February 1, 2018 from http://www.jrsa.org/pubs/sac-digest/vol-26/co-hb15-1273-studentcontacts.pdf.

Colorado Department of Revenue, Colorado Liquor Excise Tax. (2017). Retrieved February 6, 2018, from http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

Colorado Department of Revenue. (2015). Colorado Marijuana Enforcement Division: Annual update. Denver, CO: Author.Colorado Hospital Association. (2016). As reported in Monitoring Health Concerns Related to Marijuana in Colorado. Retreived Jan 20, 2018 from https://www.researchgate.net/profile/Katelyn_Hall2/publication/316885353_Monitoring_Health_Concerns_Related_to_Marijuana_in_Colorado_2016/links/591631b40f7e9b70f49dc1b2/Monitoring-Health-Concerns-Related-to-Marijuana-in-Colorado-2016.pdf

Colorado Springs Gazette. (20 Mar. 2015). Special report, Clearing the haze: Black market is thriving in Colorado.

Colorado State Patrol. (2017). CSP Citation for Drug Impairment by Drug Type. Crombie, N. (2016, June 8). Task force looks at energy, water use related to marijuana production. Oregonian. Retrieved February 3, 2018, from http://www.oregonlive.com/marijuana/index.ssf/2016/06/task_force_looks_at_energy_wat.html

Darling, D. (2017, June 15). Oregon State University researchers find more college students using marijuana since legalization. Register-Guard. Retrieved February 3, 2018, from http://projects.registerguard.com/rg/news/local/35676552-75/oregon-state-university-researchers-find-more-college-students-using-marijuana-since-legalization.html.csp

Disaster Center. (n.d.). Oregon Crime Rates 1960–2015. Retrieved February 3, 2018, from http://www.disastercenter.com/crime/orcrime.htm

District of Columbia Metropolitan Police Department. (2016). Marijuana possession arrest by race/ethnicity, DC MPD data, 2012 through July 26, 2015. Washington, DC: Author. Retrieved February 3, 2018, from https://doh.dc.gov/sites/default/files/dc/sites/doh/publication/attachments/Marijuana%20Report%20Final%2005%2016%2016_0.pdf

Division of Probation Services. (2017). As reported in http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

Drug use a problem for employers. (2015, March 24). Colorado Springs Gazette. Retrieved February 3, 2018, from http://gazette.com/drug-use-a-problem-for-employers/article/1548427

Finn, K. (2015). The hidden costs of marijuana use in Colorado: One emergency department's experience. Journal of Global Drug Policy and Practice, 10(2), 1–26. Retrieved February 3, 2018, from http://www.globaldrugpolicy.org/Issues/Vol 10 Issue 2/Articles/The Hidden Costs of Marijuana Use in Colorado_Final.pdf

Fischer, B., Russell, C., Sabioni P., Brink, W., Le Foll, B., Hall, W., … Room, R. (2017). Lower-risk cannabis use guidelines: A comprehensive update of evidence and recommendations. American Journal of Public Health, 107(8), E1–E2. doi: 10.2105/AJPH.2017.303818

Foeller, M. E., & Lyell, D. J. (2017). Marijuana use in pregnancy: Concerns in an evolving era. Journal of Midwifery and Women's Health, 62(3), 363–367. doi: 10.1111/jmwh.12631

Freisthler, B., Gaidus, A., Tam, C., Ponicki, W. R., & Gruenewald, P. J. (2017). From medical to recreational marijuana sales: Marijuana outlets and crime in an era of changing marijuana legislation. Journal of Primary Prevention, 38(3), 249–263. doi: 10.1007/s10935-017-0472-9

Gilman, J. M., Kuster, J. K., Lee, S., Lee, M. J., Kim, B. W., Makris, N., … Breiter, H. C. (2014). Cannabis use is quantitatively associated with nucleus accumbens and amygdala abnormalities in youth adult recreational users. Journal of Neuroscience, 34(16), 5529–5538. doi: 10.1523/JNEUROSCI.4745-13.2014

Hall, W., & Lynskey, M. (2016). Evaluating the public health impacts of legalizing recreational cannabis use in the United States. Addiction, 111(10), 1764–1773. doi: 10.1111/add.13428

Hasin, D. S., Keyes, K. M., Alderson, D., Wang, S., Aharonovich, E., & Grant, B. F. (2008). Cannabis withdrawal in the United States: Results from NESARC. Journal of Clinical Psychiatry, 69(9), 1354–1363. Retrieved February 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2777674/

Hatch, A. (2017). Researchers tracking public health impacts of marijuana legalization. Pullman, WA: Washington State University. Retrieved February 3, 2018, from https://nursing.wsu.edu/2017/04/14/13255/

Haughwout, P., & Slater, M. (2017). Surveillance report #108: Apparent per capita alcohol consumption: National, state, and regional trends, 1977–2015. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism. Retrieved February 3, 2018, from https://www.niaaa.nih.gov/sites/default/files/publications/Surveillance/Surveillance108/CONS15.pdf

Hawryluk, M. (2017, January 6). Mainstreaming marijuana: Pot legalization is revealing unintended consequences. The Bulletin. Retrieved February 3, 2018, from http://www.bendbulletin.com/health/4718634-151/mainstreaming-marijuana

Highway Loss Data Institute. (2017, August 3). Studies link legalized use of recreational marijuana with increase in crashes. Status Report, 52(5). Retrieved February 3, 2018, from http://www.iihs.org/iihs/sr/statusreport/article/52/5/3

Hlavac, G. C., & Easterly, E. J. (2016). Legal issues: Marijuana in the workplace. Bethlehem, PA: National Association of Colleges and Employers. Retrieved from http://www.naceweb.org/public-policy-and-legal/legal-issues/legal-issues-marijuana-in-the-workplace/

Hughes, T. (2017, July 31). Marijuana's legalization fuels black market in other states. USA Today. Retrieved February 3, 2018, from https://www.usatoday.com/story/news/nation/2017/07/31/marijuana-black-market/507417001/

Huizink, A. C., & Mulder, E. J. (2006). Maternal smoking, drinking, or cannabis use during pregnancy and neurobehavioral and cognitive functioning in human offspring. Neuroscience and Biobehavioral Reviews, 30(1), 24–41. Retrieved February 3, 2018, from https://doi.org/10.1016/j.neubiorev.2005.04.005

Institute for Behavior and Health. (n.d.). Drug legalization: A false hope. Retrieved January 20, 2018, from https://www.ibhinc.org/drug-legalization/

Johnson, R. (2017, November 9). Oregon pot processor arrested in Lincoln after $1.1M in cannabis extract found. Lincoln Journal Star. Retrieved February 3, 2018, from http://journalstar.com/news/local/911/oregon-pot-processor-arrested-in-lincoln-after-m-in-cannabis/article_26e24d67-7ed1-52e2-b27c-a4b7a60f3db9.html

Johnson, T. (2016, May 10). Fatal road crashes involving marijuana double after state legalizes drug. AAA NewsRoom. Retrieved February 3, 2018, from http://newsroom.aaa.com/2016/05/fatal-road-crashes-involving-marijuana-double-state-legalizes-drug/

Kent, K. (2016, September 1). CO hospitals see dramatic spike in pot-related illnesses. KTVZ News. Retrieved February 3, 2018, from http://www.ktvz.com/news/bend/c-o-hospitals-see-dramatic-spike-in-pot-related-illnesses/69167250

Kindland. (2016, August 20). We tried 99 percent THC-A Crystalline dabs, and it was chill. Retrieved February 3, 2018, from https://www.thekindland.com/products/we-tried-99-percent-thc-a-crystalline-dabs-and-it-1983

Kolb, J. J. (2017, May 17). Legalized marijuana turns Colorado resort town into homeless magnet. Fox News. Retrieved February 3, 2018, from http://www.foxnews.com/us/2017/05/17/legalized-marijuana-turns-colorado-resort-town-into-homeless-magnet.html

Larson, D. (2018). Record number of mailed marijuana packages caught by feds in Colorado last year. Denver 7 News. Retreived February 9, 2018, from https://www.thedenverchannel.com/news/investigations/record-number-of-mailed-marijuana-packages-caught-by-feds-in-colorado-last-year

Marcum, J. L., Chin, B., Anderson, N., & Bonauto, D. K. (2017). Self-reported work-related injury or illness—Washington, 2011–2014. Morbidity and Mortality Weekly Report, 66(11). Retrieved February 3, 2018, from https://www.cdc.gov/mmwr/volumes/66/wr/mm6611a6.htm

McGreevy, P. (2017, July 26). California has too much pot, and growers won't be able to export the surplus. Los Angeles Times. Retrieved February 3, 2018, from http://www.latimes.com/politics/essential/la-pol-ca-essential-politics-updates-california-producing-pot-surplus-1501101923-htmlstory.html

Meier, M. H., Caspi, A., Ambler, A., Harrington, H., Houts, R., Keefe, R. S., … Moffitt, T. E. (2012). Persistent cannabis users show neuropsychological decline from childhood to midlife. Proceedings of the National Academy of Sciences, 109(40), E2657–2664. doi: 10.1073/pnas.1206820109

Meier, M. H., Hill, M. L., Small, P. J., & Luthar, S. S. (2015). Associations of adolescent cannabis use with academic performance and mental health: A longitudinal study of upper middle class youth. Drug and Alcohol Dependence, 156, 207–212. doi: 10.1016/j.drugalcdep.2015.09.010

Migoya, D. (2017, August 25). Exclusive: Traffic fatalities linked to marijuana are up sharply in Colorado; Is legalization to blame? Denver Post. Retrieved February 3, 2018, from https://www.denverpost.com/2017/08/25/colorado-marijuana-traffic-fatalities/

Miller, C. L. (in press). The impact of marijuana on mental health. In K. Sabet & K. Winters (Eds.), Contemporary health issues on marijuana. Oxford, UK: Oxford University Press.

Mills, E. (2012). The carbon footprint of indoor cannabis production. Energy Policy, 58–69. Retrieved February 3, 2018, from http://evanmills.lbl.gov/pubs/pdf/cannabis-carbon-footprint.pdf

Mitchell, K. (2017, July 11). Crime rate in Colorado increases much faster than rest of the country. Denver Post. Retrieved February 3, 2018, from https://www.denverpost.com/2017/07/11/colorado-sees-big-increase-crime-10-percent-higher-murder-rate/

Mock, B. (2015, July 8). This is how much energy it takes to legalize weed. Mother Jones. Retrieved February 3, 2018, from https://www.motherjones.com/environment/2015/07/marijuana-energy-denver/

Moyer, J. W. (2017, July 11). DC arrests for public use of marijuana nearly tripled last year. Washington Post. Retrieved from https://www.washingtonpost.com/local/public-safety/dc-arrests-for-public-use-of-marijuana-nearly-tripled-last-year/2017/07/11/906bea50-627d-11e7-8b2b-b6c8c99c3bea_story.html?utm_term=.6f023f47928c

Munoz E, Flick P, Lucero L, English K. (2017). Summary of Law Enforcement and District Attorney Reports of Student Contacts: 2012-2014, 2014-2015, 2015-2016. Colorado Department of Public Safety. Retrieved February 8, 2017, from http://www.jrsa.org/pubs/sac-digest/vol-26/co-hb15-1273-studentcontacts.pdf

Murray, D.W. (2016). Misrepresenting Colorado marijuana. Washington, DC: Hudson Institute. Retrieved February 3, 2018, from https://www.hudson.org/research/12615-misrepresenting-colorado-marijuana

National Highway Traffic Safety Administration, Fatality Analysis Reporting System (FARS) 2006-2011 and Colorado Department of Transportation 2012-2016. Retrieved February 6, 2018, from http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

National Survey on Drug Use and Health. (2006-2017). State use estimates [Data file]. Retrieved from https://www.samhsa.gov/data/population-data-nsduh

Nicholson, K. (2017, June 30). Hiker finds illegal marijuana grows worth $7 million in San Isabel National Forest. Denver Post. Retrieved February 3, 2018, from https://www.denverpost.com/2017/06/30/illegal-marijuana-grow-san-isabel-national-forest/

Northwest High Intensity Drug Trafficking Area. (2016). Washington state marijuana impact report. Retrieved February 3, 2018, from http://www.riag.ri.gov/documents/NWHIDTAMarijuanaImpactReportVolume1.pdf

O'Connor, S., Danelo, A., Fukano, H., Johnson, K., Law, C., & Shortt, D. (2016). Estimating canopy size for the Washington medical marijuana market. Seattle, WA: University of Washington School of Law, Cannabis Law and Policy Project. Retrieved February 3, 2018, from https://lcb.wa.gov/publications/Marijuana/Estimating-Canopy-Size-for-the-Washington.pdf

Olfson, M., Wall, M. M., Liu, S., & Blanco, C. (2017). Cannabis use and risk of prescription opioid use disorder in the United States. American Journal of Psychiatry, 175(1), 47–53. doi: 10.1176/appi.ajp.2017.17040413

Oregon Health Authority. (2016). Oregonians marijuana use, attitudes, and health effects. Salem, OR: Author. Retrieved February 3, 2018, from https://apps.state.or.us/Forms/Served/le8509b.pdf

Oregon Liquor Control Comission. (2016). 2015 House Bill 3400 DUI Legislative Report. Retrieved February 6, 2018, from http://www.oregon.gov/olcc/marijuana/Documents/HB3400_2015_DUIILegislativeReport.pdf

Oregon Liquor Control Commission. (2018, January 10). Licensees across Oregon fail to stop sales to minors [News Release]. Retrieved February 3, 2018, from http://supertalkradio.com/news/licensees-across-oregon-fail-to-stop-sales-to-minors/

Oregon State Police-Drug Enforcement Section. (2017). A baseline evaluation of cannabis enforcement priorities in Oregon. Retrieved February 3, 2018, from https://learnaboutsam.org/wp-content/uploads/2017/04/Oregon-State-Police-report-January-2017.pdf

Pacher, P., Steffens, S., Hasko, G., Schindler, T. H., & Kunos, G. (2017). Cardiovascular effects of marijuana and synthetic cannabinoids: The good, the bad, and the ugly. Nature Reviews Cardiology. doi: 10.1038/nrcardio.2017.130

Paschall, M. J., Grube, J. W., & Biglan, A. (2017). Medical marijuana legalization and marijuana use among youth in Oregon. Journal of Primary Prevention, 38(3), 329–341. doi: 10.1007/s10935-017-0476-5

Quest Diagnostics. (2016). Increases in illicit drugs, including cocaine, drive workforce drug positivity to highest rate in 12 years. Secaucus, NJ: Author. Retrieved February 3, 2018, from http://newsroom.questdiagnostics.com/2017-05-16-Increases-in-Illicit-Drugs-Including-Cocaine-Drive-Workforce-Drug-Positivity-to-Highest-Rate-in-12-Years-Quest-Diagnostics-Analysis-Finds

Rocky Mountain High Intensity Drug Trafficking Area. (2017). The legalization of marijuana in Colorado: The impact. Retrieved February 3, 2018, from http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

Rocky Mountain Poison and Drug Center. (2017). Retrieved December 22, 2017, from http://www.rmhidta.org/html/FINAL%202017%20Legalization%20of%20Marijuana%20in%20Colorado%20The%20Impact.pdf

Roy, A. (2017, September 7). Marijuana grow found on two islands in the Colorado River. KUSA. Retrieved February 3, 2018, from http://www.9news.com/article/news/crime/marijuana-grow-found-on-two-islands-in-the-colorado-river/472187162

Secades-Villa, R., Garcia-Rodríguez, O., Jin C. J., Wang, S., & Blanco, C. (2015). Probability and predictors of the cannabis gateway effect: A national study. International Journal of Drug Policy, 26(2), 135–142. doi: 10.1016/j.drugpo.2014.07.011

Silins, E., Horwood, J., Patton, G. C., Fergusson, D. M., Olsson, C. A., Hutchinson, D. M., … Mattick, R. P. (2014). Young adult sequelae of adolescent cannabis use: An integrative analysis. The Lancet Psychiatry, 1(4), 286–293. doi: http://dx.doi.org/10.1016/S2215-0366(14)70307-4 Special report, "clearing the haze:" Black market is thriving in Colorado. (2015, March 20). Colorado Springs Gazette. Retrieved February 3, 2018, from http://gazette.com/special-report-clearing-the-haze-black-market-is-thriving-in-colorado/article/1548305

Stewart, M. (2017, September 27). Rural marijuana grows rising in the state of Colorado. Denver News. Retrieved February 3, 2018, from https://www.thedenverchannel.com/news/local-news/marijuana/rural-marijuana-grows-rising-in-the-state-of-colorado Thomas, C., & Freisthler, B. (2017). Erratum to: Evaluating the change in medical marijuana dispensary locations in Los Angeles following the passage of local legislation. Journal of Primary Prevention, 38(3), 343. doi: 10.1007/s10935-017-0479-2

U.S. Attorney's Office. (2015). Confronting wave of illicit marijuana cultivation, federal, state and local authorities discover and destroy major marijuana grows in locations across Colorado [Press Release]. Retrieved February 3, 2018, from https://www.justice.gov/usao-co/pr/confronting-wave-illicit-marijuana-cultivation-federal-state-and-local-authorities

U.S. Government Accountability Office. (2015). DOJ should document its approach to monitoring the effects of legalization (Publication No. GAO-16-1). Washington, DC: Author. Retrieved February 3, 2018, from https://www.gao.gov/products/GAO-16-1Wang, G.S. (2017). Pediatric concerns due to expanded cannabis use: Unintended consequences of legalization. Journal of Medical Toxicology, 13(1), 99–105. doi: 10.1007/s13181-016-0552-x

Wang, G.S. Hall, K., Vigil, D., Banerji, S., Monte, A., VanDyke, M. (2017). Marijuana and acute health care contacts in Colorado. Preventative Medicine; doi:10.1016/j.ypmed.2017.03.022.

Washington State Liquor and Cannabis Board. (2017). Enforcement and compliance data [Data file]. Retrieved February 3, 2018, from https://data.lcb.wa.gov/stories/s/WSLCB-Marijuana-Dashboard/hbnp-ia6v/

Washington State Office of Financial Management, Forecasting and Research Division. (2017). Monitoring impacts of recreational marijuana legalization. Olympia, WA: Author. Retrieved February 3, 2018, from https://www.ofm.wa.gov/sites/default/files/public/legacy/reports/marijuana_impacts_update_2016.pdf

Washington Traffic Safety Commission. (2016). Driver toxicology testing and the involvement of marijuana in fatal crashes, 2010–2014. Olympia, WA: Author. Retrieved February 3, 2018, from http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2015/10/Driver-Toxicology-Testing-and-the-Involvement-of-Marijuana-in-Fatal-Crashes_REVFeb2016.pdf

Wilkinson, S. T., Yarnell, S., Radhakrishnan, R., Ball, S. A., & D'Souza, D. C. (2016). Marijuana legalization: Impact on physicians and public health. Annual Review of Medicine, 67, 453–466. doi: https://doi.org/10.1146/annurev-med-050214-013454

Williams, B. J. (2018, January 12). U.S. Attorney: A call for transparency and action on marijuana (Guest opinion). The Oregonian. Retrieved February 3, 2018, from http://www.oregonlive.com/opinion/index.ssf/2018/01/us_attorney_a_call_for_transpa.html

Wohlforth, C. (2018, January 11). Marijuana school suspensions more than doubled after legalization. Anchorage Daily News. Retrieved February 3, 2018, from https://www.adn.com/opinions/2018/01/11/marijuana-school-suspensions-more-than-doubled-after-legalization/

Zubrzycki, J. (2016). Colorado Sees Surge in Child Homelessness. Retrieved February 27, 2018 at http://www.coloradotrust.org/content/story/colorado-sees-surge-child-homelessness

WASHINGTON, COLORADO,
OREGON, ALASKA, AND
WASHINGTON, DC

SAM Smart Approaches to Marijuana
preventing another big tobacco

www.learnaboutsam.org