



THE LEGALIZATION OF MARIJUANA IN COLORADO: *THE IMPACT*

Volume 8
September 2021

Rocky Mountain High Intensity
Drug Trafficking Area



Photo: Collin Riley

REPORT AVAILABLE AT:
www.RMHIDTA.org

**PREPARED BY THE ROCKY MOUNTAIN HIDTA
INVESTIGATIVE SUPPORT CENTER
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Table of Contents

Rocky Mountain High Intensity Drug Trafficking Area.....	1
Table of Contents.....	i
Executive Summary.....	2
Introduction.....	4
Purpose.....	4
Background.....	4
Section I: Traffic Fatalities & Impaired Driving.....	6
Some Findings.....	6
Definitions by Rocky Mountain HIDTA.....	6
Traffic Fatalities.....	7
Impaired Driving.....	12
Impaired Driving Information.....	15
Section II: Marijuana Use.....	17
Some Findings.....	17
Data Consideration.....	17
National Survey on Drug Use and Health (NSDUH) Data.....	18
Marijuana in Schools.....	21
Probationer Marijuana Use.....	22
Marijuana Use Information.....	23
Section III: Public Health.....	25
Some Findings.....	25
Definitions by Rocky Mountain HIDTA.....	25
Emergency Department Data.....	26
Poison Control/Marijuana Exposure Data.....	27
Treatment Data.....	29
Suicide Data.....	30
Colorado Opioid Overdose Deaths.....	32
Public Health Information.....	33
Section IV: Black-Market.....	35
Some Findings.....	35
Definitions by Rocky Mountain HIDTA.....	35

Task Force Investigations	36
Colorado Organized Crime Control Act Filings	38
Highway Interdiction Data.....	39
Black Market Information.....	40
Section V: Societal Impact.....	40
Some Findings	41
Tax Revenue	41
Crime	Error! Bookmark not defined.
Local Response	43
Medical Marijuana Statistics.....	45
Alcohol Consumption	46
Societal Impact Information	47

Executive Summary

The Rocky Mountain High Intensity Drug Trafficking Area (RMHIDTA) program has published annual reports every year since 2013 tracking the impact of legalizing recreational marijuana in Colorado. The purpose is to provide data and information so that policy makers and citizens can make informed decisions on the issue of marijuana legalization.

Section I: Traffic Fatalities & Impaired Driving

- Since recreational marijuana was legalized in 2013, traffic deaths where drivers tested positive for marijuana **increased 138%** while all Colorado traffic deaths **increased 29%**.
- Since recreational marijuana was legalized, traffic deaths involving drivers who tested positive for marijuana **more than doubled** from 55 in 2013 to 131 people killed in 2020.
- Since recreational marijuana was legalized, the percentage of all Colorado traffic deaths involving drivers who tested positive for marijuana **increased from 11% in 2013 to 20%** in 2020.

Section II: Marijuana Use

Since recreational marijuana was legalized in 2013:

- Past month marijuana use for ages 12 and older **increased 26%** and is **61% higher** than the national average, currently ranked **3rd** in the nation.
- Past month adult marijuana use (ages 18 and older) **increased 20%** and is **62% higher** than the national average, currently ranked **3rd** in the nation.
- Past month college age marijuana (ages 18-25) use **increased 10%** and is **53% higher** than the national average, currently ranked **3rd** in the nation.
- Past month youth marijuana (ages 12-17) use **decreased 22%** and is **39% higher** than the national average, currently ranked **7th** in the nation.

Section III: Public Health

- Marijuana *only* exposures **increased 185%** from 2013 when recreational marijuana was legalized compared to 2020.
- Treatment for marijuana use for all ages **decreased 34%** from 2013 to 2020.
- The percent of suicide incidents in which toxicology results were positive for marijuana has **increased** from **14%** in 2013 to **29%** in 2020.

Section IV: Black Market

- RMHIDTA Colorado Drug Task Forces (10) conducted **294 investigations** of black-market marijuana in Colorado resulting in:
 - **168** felony arrests
 - **5.54** tons of marijuana seized
 - **86,502** marijuana plants seized
 - **21** different states the marijuana was destined
- Seizures of marijuana reported to the El Paso Intelligence Center (EPIC) in Colorado **increased 48%** from an average of 174 parcels (2009-2012) when marijuana was commercialized to an average of 257 parcels (2013-2020) during the time recreational marijuana become legalized.

Section V: Societal Impact

- Marijuana tax revenue represent approximately **0.98%** of Colorado's FY 2020 budget.
- **66%** of local jurisdictions in Colorado have banned medical and recreational marijuana businesses.

Introduction

Purpose

The purpose of this annual report is to document the impact of the legalization of marijuana for medical and recreational use in Colorado. Colorado serves as an experimental lab for the nation to determine the impact of legalizing marijuana. This is an important opportunity to gather and examine meaningful data and identify trends. Citizens and policymakers nationwide may want to delay any decisions on this important issue until there is sufficient and accurate data to make informed decisions. Readers are encouraged to review previous volumes of this report for a comprehensive understanding of the topic. These reports were prepared to identify data and trends related to the legalization of marijuana so that informed decisions can be made regarding this issue.

Background

It is important to note that, for purposes of the debate on legalizing marijuana in Colorado, there are three distinct timeframes to consider: the early medical marijuana era (2000-2008), the medical marijuana commercialization era (2009–current) and the recreational marijuana era (2013–current).

- **2000 – 2008, Early Medical Marijuana Era:** In November 2000, Colorado voters passed Amendment 20 which permitted a qualifying patient, and/or caregiver of a patient, to possess up to 2 ounces of marijuana and grow 6 marijuana plants for medical purposes. During that time there were between 1,000 and 4,800 medical marijuana cardholders and no known dispensaries operating in the state.
- **2009 – Current, Medical Marijuana Commercialization Era:** Beginning in 2009 due to a number of events, marijuana became de facto legalized through the commercialization of the medical marijuana industry. By the end of 2012, there were over 100,000 medical marijuana cardholders and 500 licensed dispensaries operating in Colorado. There were also licensed cultivation operations and edible manufacturers.
- **2013 – Current, Recreational Marijuana Legalization Era:** In November 2012, Colorado voters passed Constitutional Amendment 64 which legalized marijuana for recreational purposes for anyone over the age of 21. The amendment also allowed for licensed marijuana retail stores, cultivation operations and edible manufacturers. Retail marijuana businesses became operational January 1, 2014.

NOTE:

Data, if available, will compare post-2009 when medical marijuana became commercialized and after 2013 when recreational marijuana became legalized.

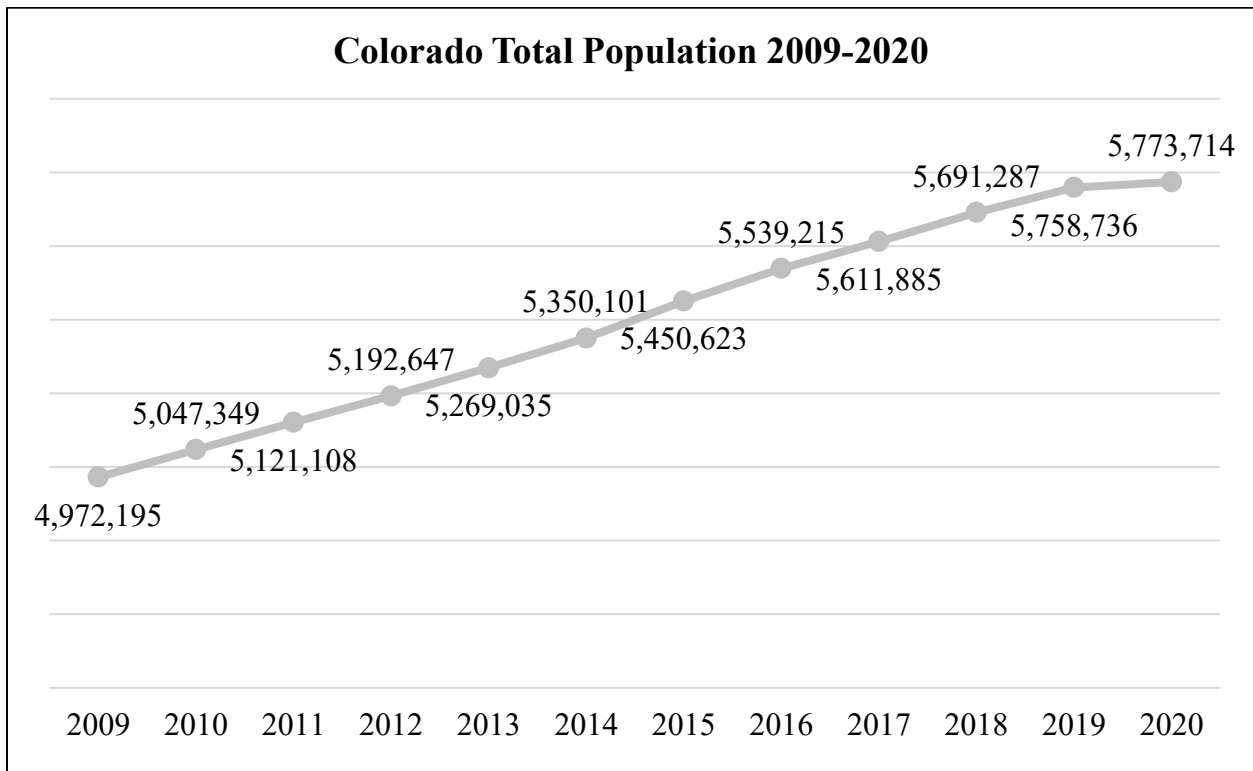
Multi-year comparisons are generally better indicators of trends. One-year fluctuations do not necessarily reflect a new trend.

Percentage comparisons may be rounded to the nearest whole number.

Percent changes found within graphs were calculated and added by RMHIDTA.

This report will cite datasets with terms such as “marijuana-related” or “tested positive for marijuana.” That does not necessarily prove that marijuana was the cause of the incident.

Throughout this report, rate per 100,000 is included to proportionately analyze various statistics. Below is Colorado’s total population from 2009 to 2020 for reference:



Section I: Traffic Fatalities & Impaired Driving

Some Findings

- Since recreational marijuana was legalized in 2013, traffic deaths where drivers tested positive for marijuana **increased 138%** while all Colorado traffic deaths **increased 29%**.
- Since recreational marijuana was legalized, traffic deaths involving drivers who tested positive for marijuana **more than doubled** from 55 in 2013 to 131 people killed in 2020.
- Since recreational marijuana was legalized, the percentage of all Colorado traffic deaths involving drivers who tested positive for marijuana **increased from 11% in 2013 to 20%** in 2020.

Definitions by Rocky Mountain HIDTA

Driving Under the Influence of Drugs (DUI/D): This term includes an individual under the influence of alcohol, marijuana, or other drugs along with any This is an important measurement since the driver’s ability to operate a vehicle was sufficiently impaired that it brought his or her driving to the attention of law enforcement. The erratic driving and the subsequent evidence that the subject was under the influence of marijuana helps confirm the causation factor.

Marijuana-Related: Also called “marijuana mentions,” is any time marijuana shows up in the toxicology report. It could be marijuana only or marijuana with other drugs and/or alcohol.

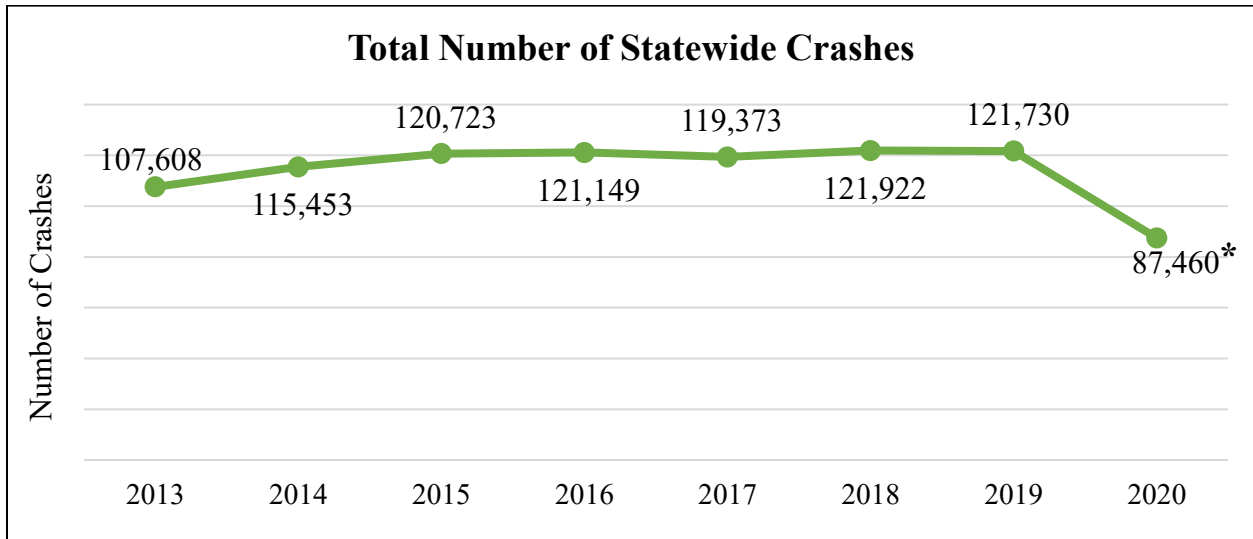
Marijuana Only: When toxicology results show marijuana and no other drugs or alcohol.

Fatalities: Any death resulting from a traffic crash involving a motor vehicle.

Drivers: An occupant who is in physical control of a transport vehicle. For an out-of-control vehicle, an occupant who was in control until control was lost.

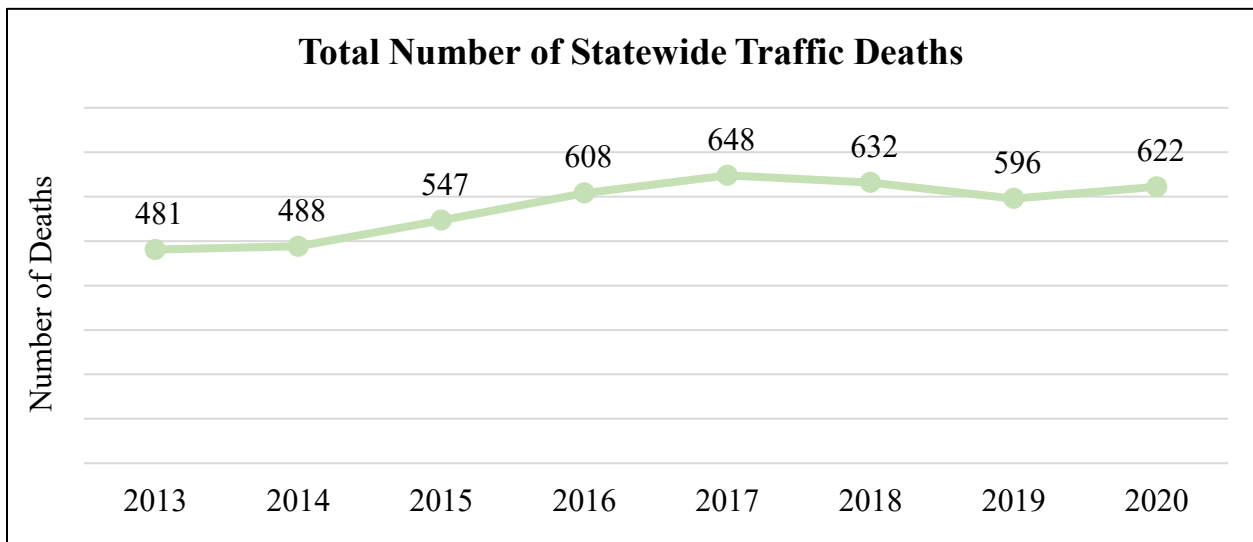
Operators: Anyone in control of their own movements such as a driver, pedestrian, or bicyclist.

Traffic Fatalities



SOURCE: Colorado Department of Transportation (CDOT)

***NOTE:** Colorado Governor Polis reported a 60% reduction in vehicle traffic in March 2020 based on automatic traffic reporters. Reference: Finley, B. (2020, April 5). *Colorado sees "significant declines" in air pollution as coronavirus ramps down driving, industrial activity.* The Denver Post.



SOURCE: CDOT 2013-2020

- In 2020, there were a total of 622 traffic deaths. Of which:
 - 402 were drivers
 - 112 were passengers
 - 93 were pedestrians
 - 15 were bicyclists

SOURCE: National Highway Traffic Safety Administration (NHTSA), Fatality Analysis Reporting System (FARS), 2009-2011 and CDOT 2012-2020

**Traffic Deaths Related to Marijuana
When a DRIVER Tested Positive for Marijuana**

Crash Year	Total Statewide Fatalities	Fatalities with <u>Drivers</u> Testing Positive for Marijuana	Percentage Total Fatalities
2013	481	55	11.4%
2014	488	75	15.4%
2015	547	98	17.9%
2016	608	125	20.6%
2017	648	138	21.3%
2018	632	115	18.2%
2019	596	127	21.3%
2020	622	131	20.1%

NOTE: Due to changes in reporting, data from before 2013 was not included.

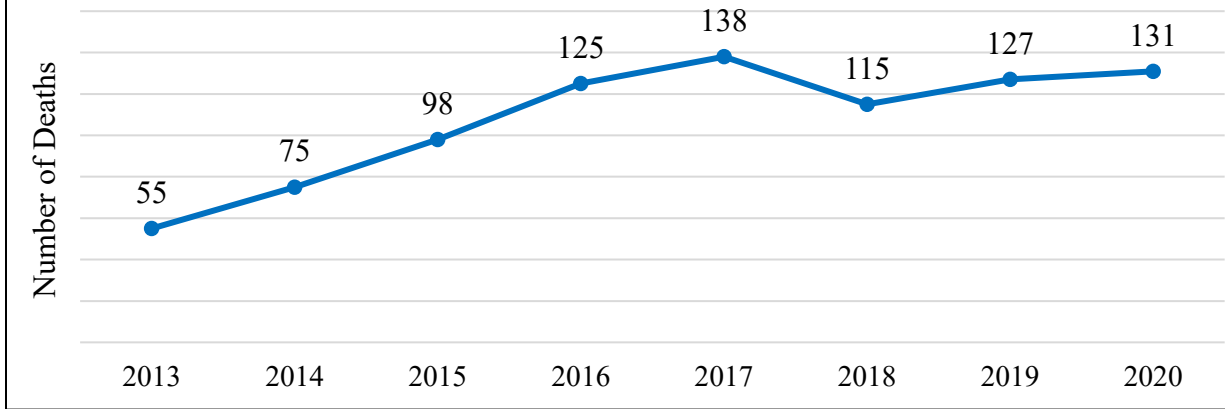
- In 2020, 131 marijuana-related traffic deaths:
 - 104 were drivers
 - 21 were passengers
 - 4 were pedestrians
 - 2 was a bicyclist

SOURCE: CDOT 2013-2020

NOTE: In 2020, 49% of drivers' blood was tested after being involved in a fatal crash.

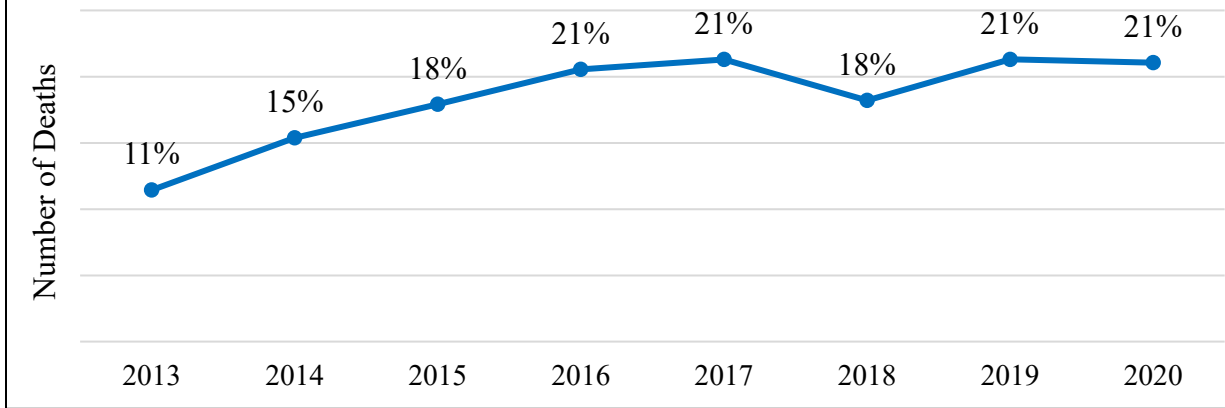
- In 2020, of the 120 drivers in fatal wrecks who tested positive for marijuana use, 117 were found to have Delta 9 tetrahydrocannabinol or THC, the psychoactive ingredient in marijuana, in their blood. This would indicate use within hours according to state data. Of those, 69% were over 5 nanograms per milliliter, the state permissible inference level for driving.
 - Similar to findings from the August 2017 article by David Migoya, “Exclusive: Traffic fatalities linked to marijuana are up sharply in Colorado. Is legalization to blame?” *The Denver Post*.

Traffic Deaths Related to Marijuana when a DRIVER Tested Positive for Marijuana



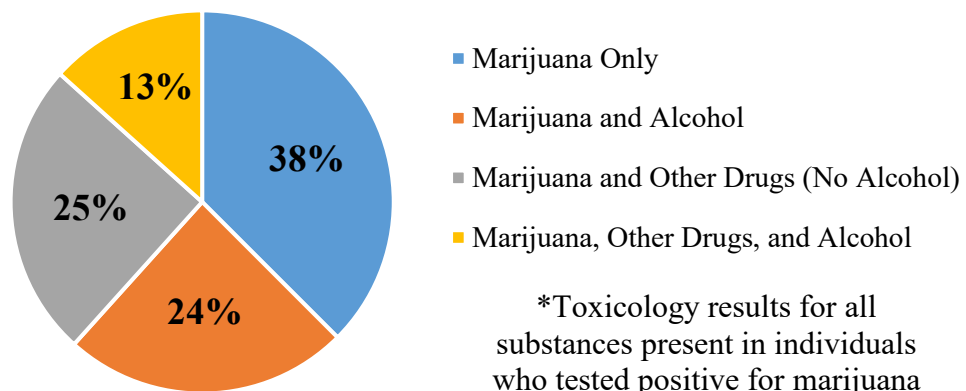
SOURCE: CDOT 2013-2020

Percent of All Traffic Deaths That Were Marijuana-Related where a DRIVER Tested Positive for Marijuana



SOURCE: CDOT 2013-2020

Drug Combinations for DRIVERS Involved in Fatal Crashes who Tested Positive for Marijuana* (2020)



SOURCE: CDOT 2013-2020

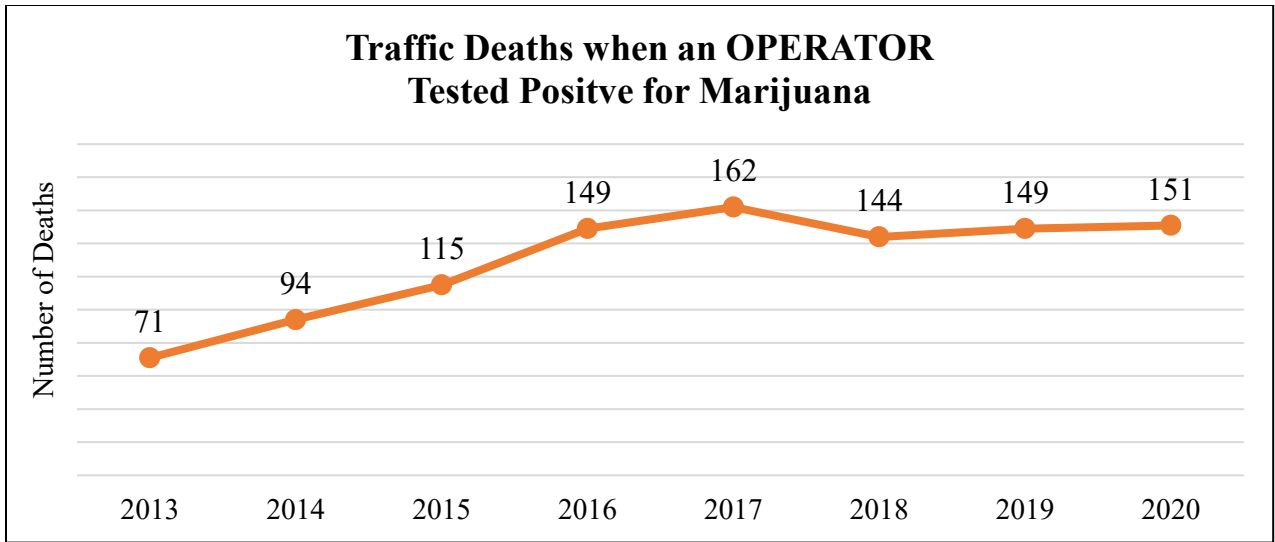
**Traffic Deaths Related to Marijuana
Where an OPERATOR Tested Positive for Marijuana**

Crash Year	Total Statewide Fatalities	Fatalities with <u>Operators</u> Testing Positive for Marijuana	Percentage Total Fatalities
2013	481	71	14.8%
2014	488	94	19.3%
2015	547	115	21.0%
2016	608	149	24.5%
2017	648	162	25.0%
2018	632	144	23.0%
2019	596	149	25.0%
2020	622	151	24.3%

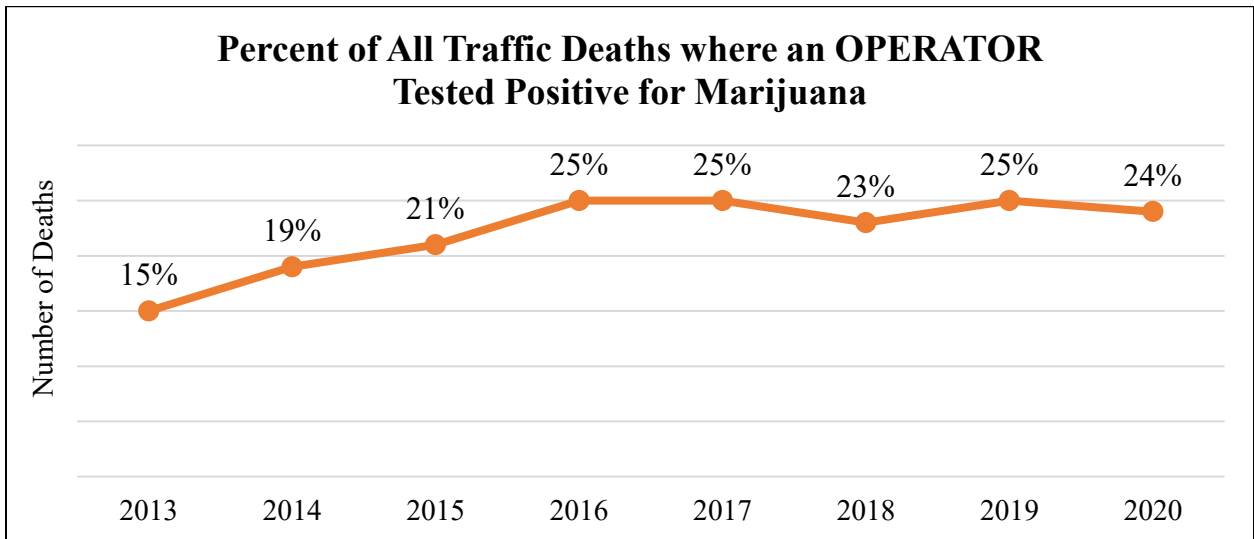
- Of the 151 marijuana-related traffic deaths:
 - 104 were drivers
 - 22 were pedestrians
 - 21 were passengers
 - 4 were bicyclists

SOURCE: CDOT 2013-2020

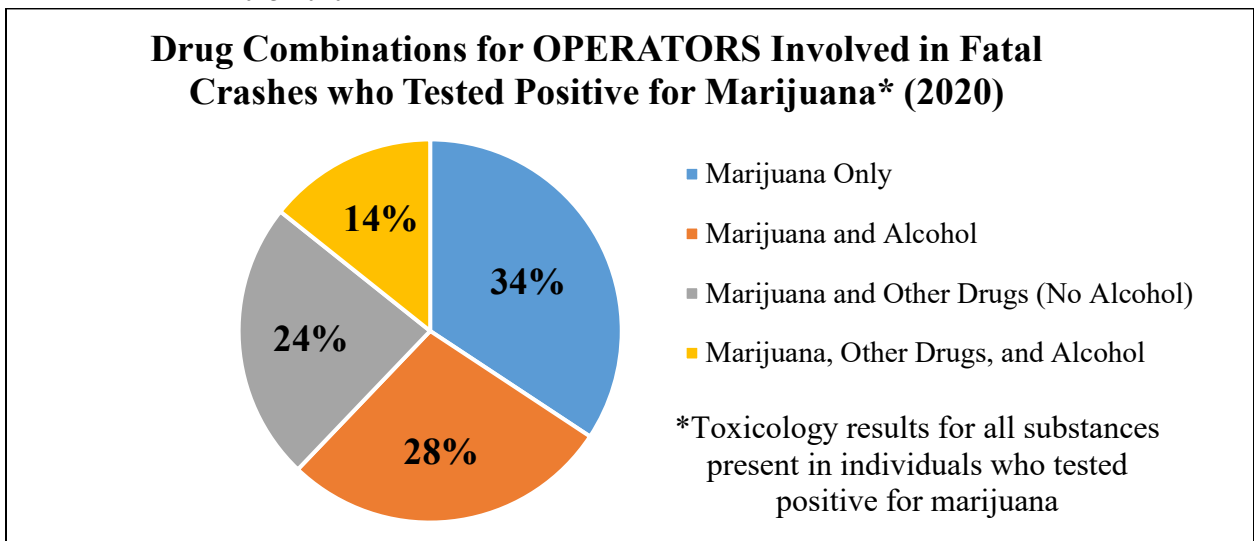
NOTE: In 2020, 51% of operators' blood was tested after being involved in a fatal crash.



SOURCE: CDOT 2013-2020



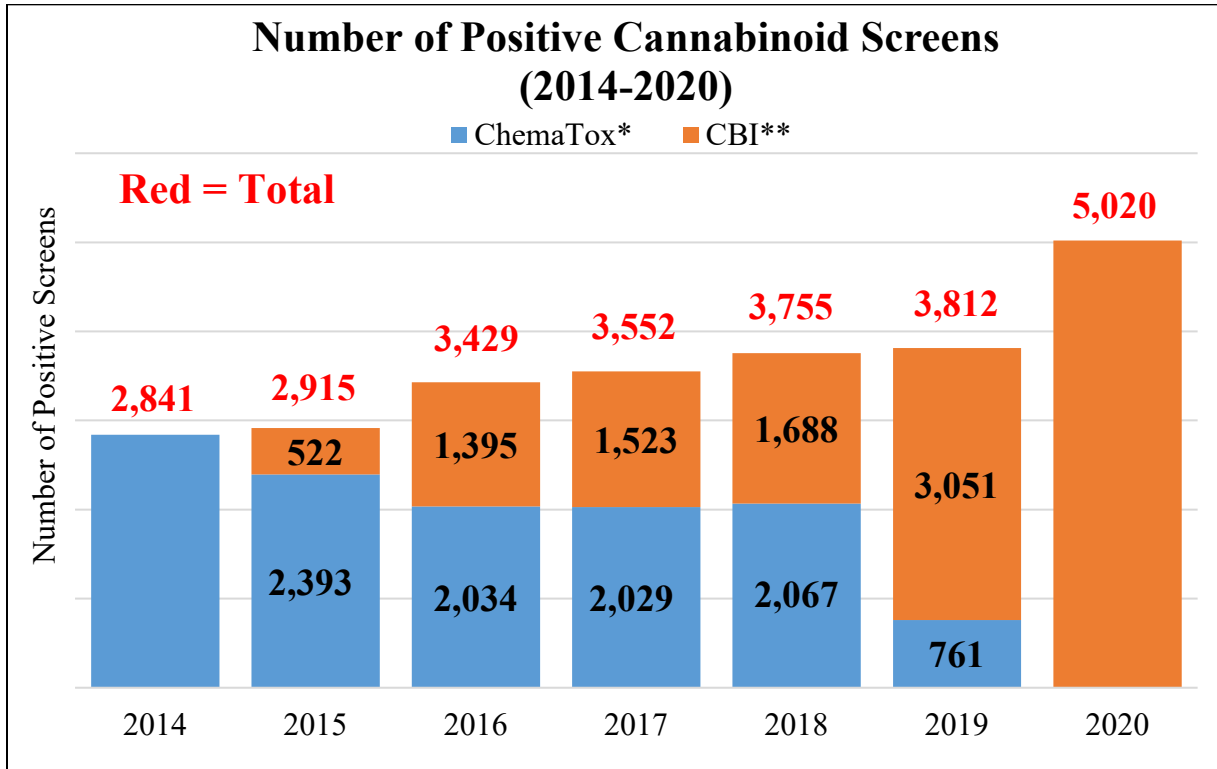
SOURCE: CDOT 2013-2020



SOURCE: CDOT 2013-2020

Impaired Driving

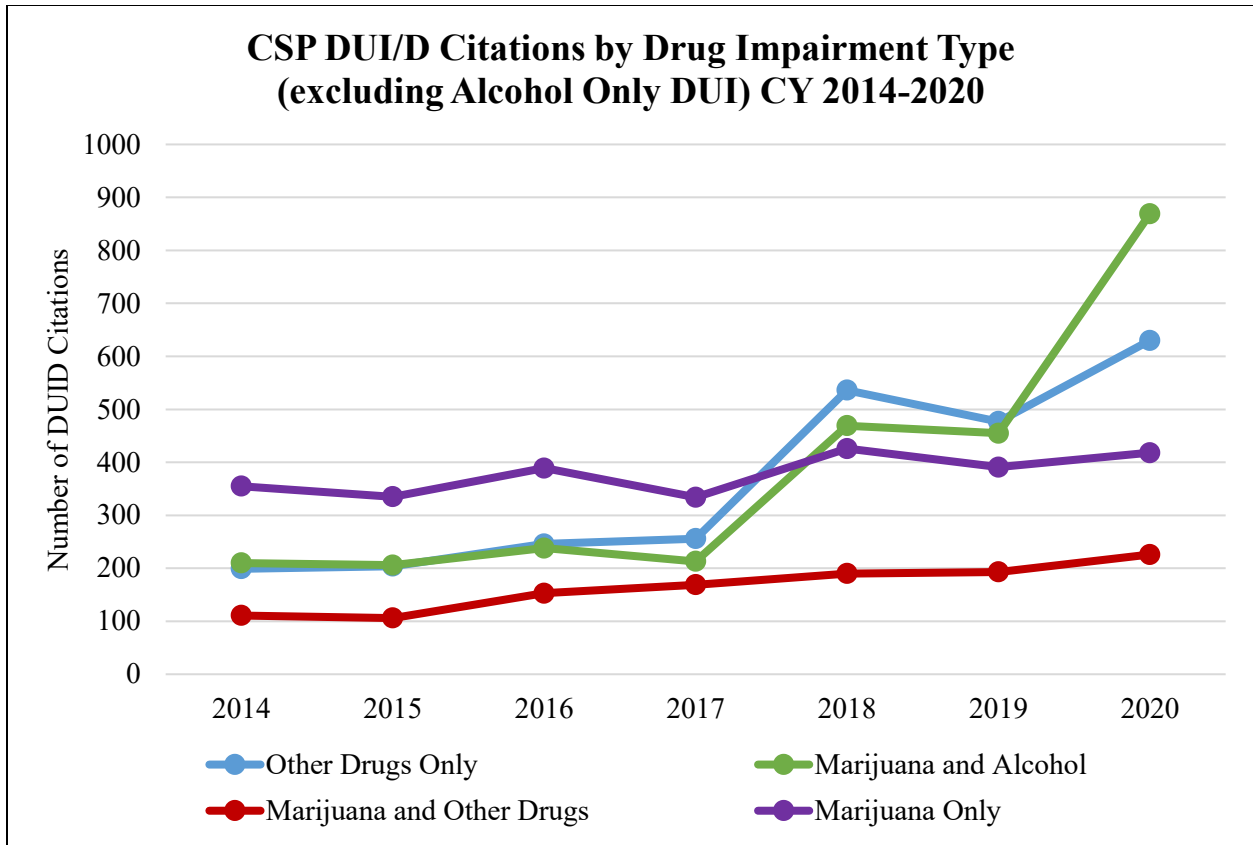
When a driver is arrested for impaired driving related to alcohol (usually 0.08 or higher blood alcohol content), typically tests for other drugs (including marijuana) are not requested since there is no additional punishment if the test comes back positive.



SOURCE: Colorado Bureau of Investigation and ChemaTox

***NOTE:** ChemaTox discontinued testing July 2019.

****NOTE:** The Colorado Bureau of Investigation began toxicology operations July 1, 2015, and became the sole agency in the state to conduct toxicology reports July 1, 2019. The vast majority of the screens are DUID submissions from Colorado law enforcement.



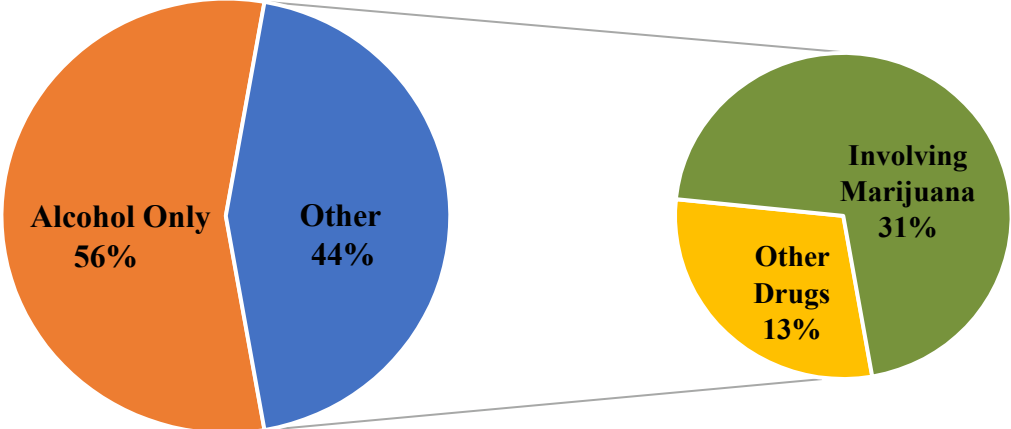
SOURCE: CSP RDW; only displaying data available as of 07/23/2021

DUI/D Citations by Drug Impairment Type							
	2014	2015	2016	2017	2018	2019	2020
Other Drugs	199	204	246	256	536	477	630
Marijuana and Alcohol	210	206	238	213	469	455	869
Marijuana and Other Controlled Substances	111	106	153	169	190	193	226
Marijuana Only	355	335	389	334	426	391	418
Alcohol Only	4,620	3,948	3,528	3,817	3,541	3,727	2,674
Total Marijuana Involved Citations	676	647	780	716	1,085	1,039	1,513
Total DUI/D Citations	5,495	4,799	4,554	4,789	5,162	5,245	4,817

SOURCE: CSP RDW; only displaying data available as of 07/23/2021

NOTE: “Citations in the Colorado State Patrol (CSP) Reporting Data Warehouse (RDW) are defined as one per involved person when the involved person has at least one charge as denoted in the RDW (excluding oral and written warnings), that occurred during a traffic stop unique on date, time, location road, mile point round, and driver’s license number. Impaired (DUI/D) citations were identified in the CSP RDW by the following common codes: 753, 754, 755, 765, 785, 800, 801, 802, 805, 806, 807, 808, 809, 810, 812, 813, 814, 815, 820, 821, or MPC.”
-Colorado State Patrol

Colorado State Patrol DUI/D Citations CY 2020



SOURCE: CSP RDW; only displaying data available as of 07/23/20210

Impaired Driving Information

THC Positive Drivers Involved in Fatal Crashes in Washington

In Washington, the AAA Foundation for Traffic Safety studied fatal crashes from 2008 to 2017 to determine the impact of the legalization of recreational marijuana. The percentage of drivers involved in a fatal crash was 88% from 2008 to 2017 compared to only 29% of drivers involved in non-fatal crashes. Of the fatal crashes, an average of 8.8% of drivers were THC-positive from 2008 to 2012. Then after recreational marijuana was legalized, the average increased to 18% of drivers testing positive for THC from 2013 to 2017. The highest level was reached in 2017 with 21% of drivers testing positive for THC that were involved in a fatal crash.

Source: Tefft, B.C. & Arnold, L.S. (2020). *Cannabis Use Among Drivers in Fatal Crashes in Washington State Before and After Legalization* (Research Brief). Washington, D.C.: AAA Foundation for Traffic Safety.

Analysis of the Impact of Recreational Marijuana Legalization on Traffic Fatalities in Colorado and Washington

In 2019, researchers examined the impact of recreational marijuana legalization on traffic fatalities in Washington and Colorado. Fatality Analysis Reporting System (FARS) from 2000 to 2016 was analyzed to compare fatal crashes where at least the driver tested positive for marijuana with the alcohol related cases. The initial findings were that marijuana-related deaths increased in Washington and Colorado compared to the rest of the country after marijuana was legalized in these two states in 2012. The rate of increase was significantly faster than the other states as well. In their final analysis, the authors were unable to determine whether the legalization of recreational marijuana alone led to the large increase in traffic fatalities in the two states.

Their conclusion states that in Colorado, “the amount of marijuana sold in recreational stores [grew] dramatically, [...] from 36,031 pounds in 2014 to 102,871 pounds in 2016. However, it is difficult to discern how much of this growth in legal recreational weed came at the expense of sales in black market or medical marijuana. Indeed, recreational marijuana can be viewed as a close substitute to black market or medical marijuana, with differences in price, quality, and ease of access. The relatively small effects we estimate are consistent with crowding-out, and could explain why we do not observe spillover effects on alcohol-related traffic accidents as other studies have found (Anderson, Hansen, and Rees 2013). Furthermore, Colorado has recently allowed consumption of marijuana in public spaces. This might increase the potential for negative externalities of recreational marijuana relative to medical marijuana. Despite that concern, we find limited overall evidence the fatalities are significantly increasing in Colorado and Washington following the legalization of recreational marijuana” (Hansen et al, 2019).

Source: Hansen, B., Miller, K., and Weber, C. (2019). *Early evidence on recreational marijuana legalization and traffic fatalities*. *Economic Inquiry*, 58(2), 547-568.

Relationship between Recreational Marijuana and Alcohol-Related Behaviors in Colorado

Some theorized that legalizing recreational marijuana would decrease the levels of alcohol consumption, while others believed that there was a positive relationship between the two. These conflicting hypotheses have generated further interest on how the legalization of recreational

marijuana impacted alcohol-related behavior in states like Colorado. Analysis of the tax revenue from alcohol sales in Colorado determined an increase in liquor tax revenue related to alcohol and alcohol-related motor vehicle crash fatalities after the legalization of recreational marijuana in Colorado. Alcohol-related crash fatalities increased by nearly two and a half fatalities per month within the state. The tax revenue increase of almost \$200,000 per month cannot definitively be linked to any changes of alcohol-related societal problems.

Source: Chamlin, M. (2021). *An examination of the unintended consequences of the legalization of recreational marijuana on alcohol-related behaviors*. Journal of Crime and Justice, 1-11

DUI Numbers Increase During Pandemic

During the height of the early stages of the pandemic from January to April 2020, DUI related deaths doubled compared to 2019 according to the Colorado State Patrol. In addition, alcohol and marijuana-related crashes increased by 32 percent during the same timeframe. The cause of this increase was unknown especially during the stay-at-home order that closed many bars. Some hypothesized that the drivers under the influence were able to drive at higher speeds with less cars on the road, leading to the increase in crashes.

Source: Grewe, L. (2020, May 26). *Despite pandemic, DUI numbers up significantly in 2020*. KKTV.

Traffic Deaths Increase Even with Less Miles Travelled

During the first half of 2020, the number of total miles travelled decreased by 17 percent compared to the first half of 2019. Despite this, the traffic deaths increased by one percent from 256 to 259 deaths. Furthermore, this increase was significant as the fatality rate increased by 20 percent due to the large decrease in miles travelled. This trend was confirmed from analysis in 22 other states.

Source: Minor, N. (2020, September 2). *Colorado's roads are emptier, but deadlier so far this year*. CPR News.

Section II: Marijuana Use

Some Findings

Since recreational marijuana was legalized in 2013:

- Past month marijuana use for ages 12 and older **increased 26%** and is **61% higher** than the national average, currently ranked **3rd** in the nation.
- Past month adult marijuana use (ages 18 and older) **increased 20%** and is **62% higher** than the national average, currently ranked **3rd** in the nation.
- Past month college age marijuana (ages 18-25) use **increased 10%** and is **53% higher** than the national average, currently ranked **3rd** in the nation.
- Past month youth marijuana (ages 12-17) use **decreased 22%** and is **39% higher** than the national average, currently ranked **7th** in the nation.

Data Consideration

Healthy Kids Colorado Survey (HKCS) data is collected in the odd years and released in even years. For this reason, HKCS data is not included in this report. Please refer to Volume 7 for the most recent numbers.

Youth Risk Behavior Surveillance System (YRBSS) data is collected in the odd years and released in even years. For this reason, YRBSS data is not included in this report. Please refer to Volume 7 for the most recent numbers.

National Survey on Drug Use and Health (NSDUH) data is averaged between two years for a more accurate representation. The most recent data averaged 2018 and 2019.

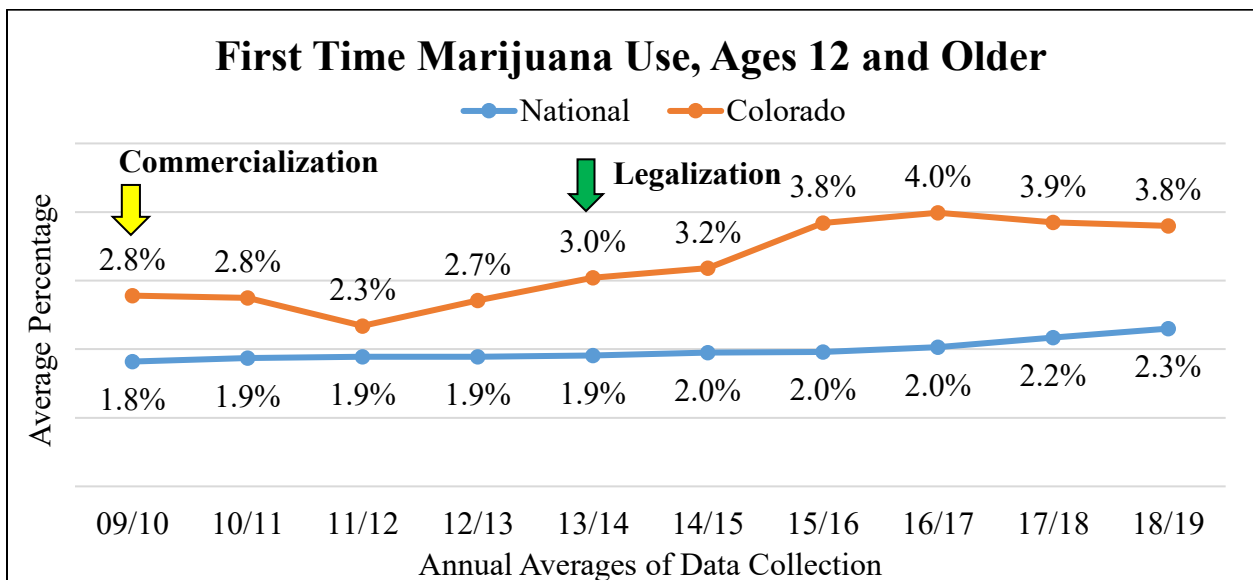
National Survey on Drug Use and Health (NSDUH) Data

Colorado Averages Compared to National Averages		
For Ages 12 and Older:	Colorado	US
Marijuana Past Month Use	17.4%	10.8%
Perceptions of Risk for Smoking Marijuana	17.7%	24.4%
Illicit Drug Use Other than Marijuana Past Month	4.7%	3.3%
Alcohol Past Month Use	60.0%	50.9%
Cigarette Past Month Use	16.3%	16.9%
Perceptions of Risk for Smoking Cigarettes	72.5%	71.5%

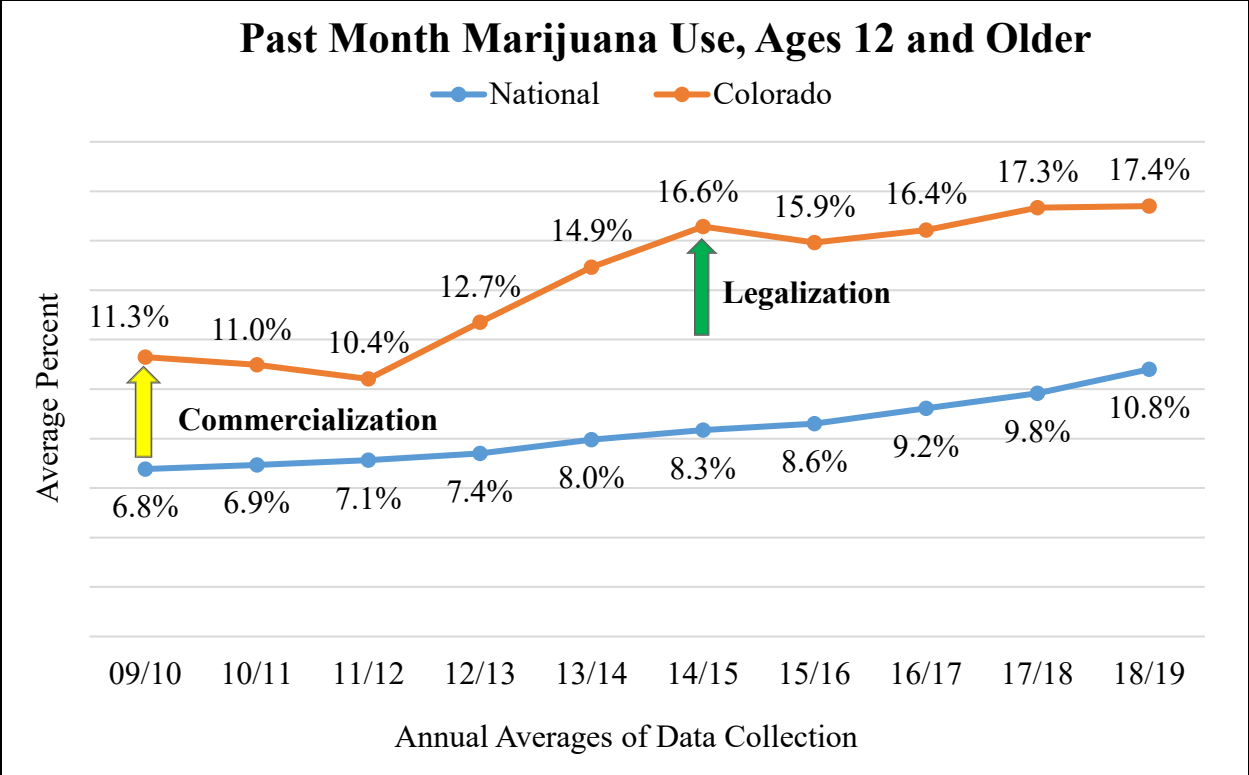
SOURCE: Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019

Marijuana First Time Use			
Age	Colorado %	Colorado U.S. Ranking	National %
12 years +	3.8%	3 rd	2.3%
12 – 17	8.0%	4 th	5.7%
18 years +	2.9%	5 th	1.7%
18 – 25	12.5%	6 th	8.4%
26+	1.2%	6 th	0.7%

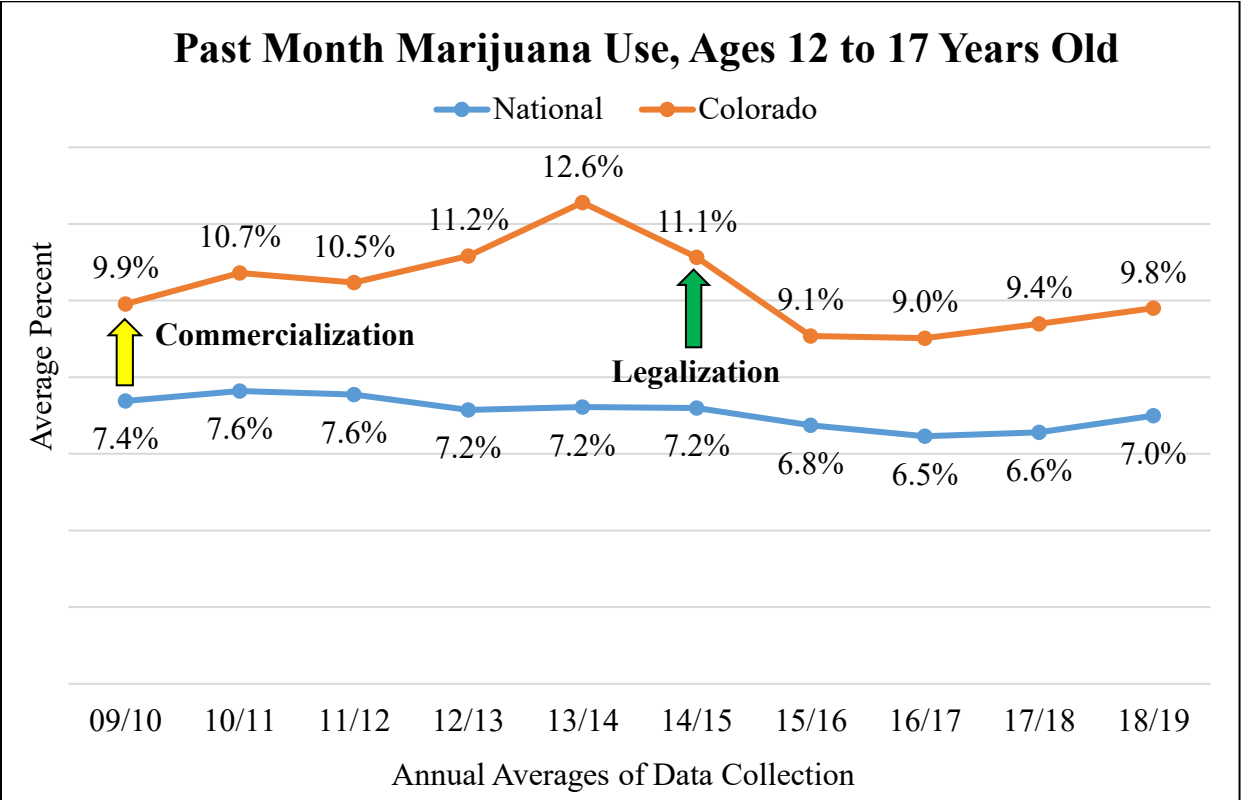
SOURCE: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019



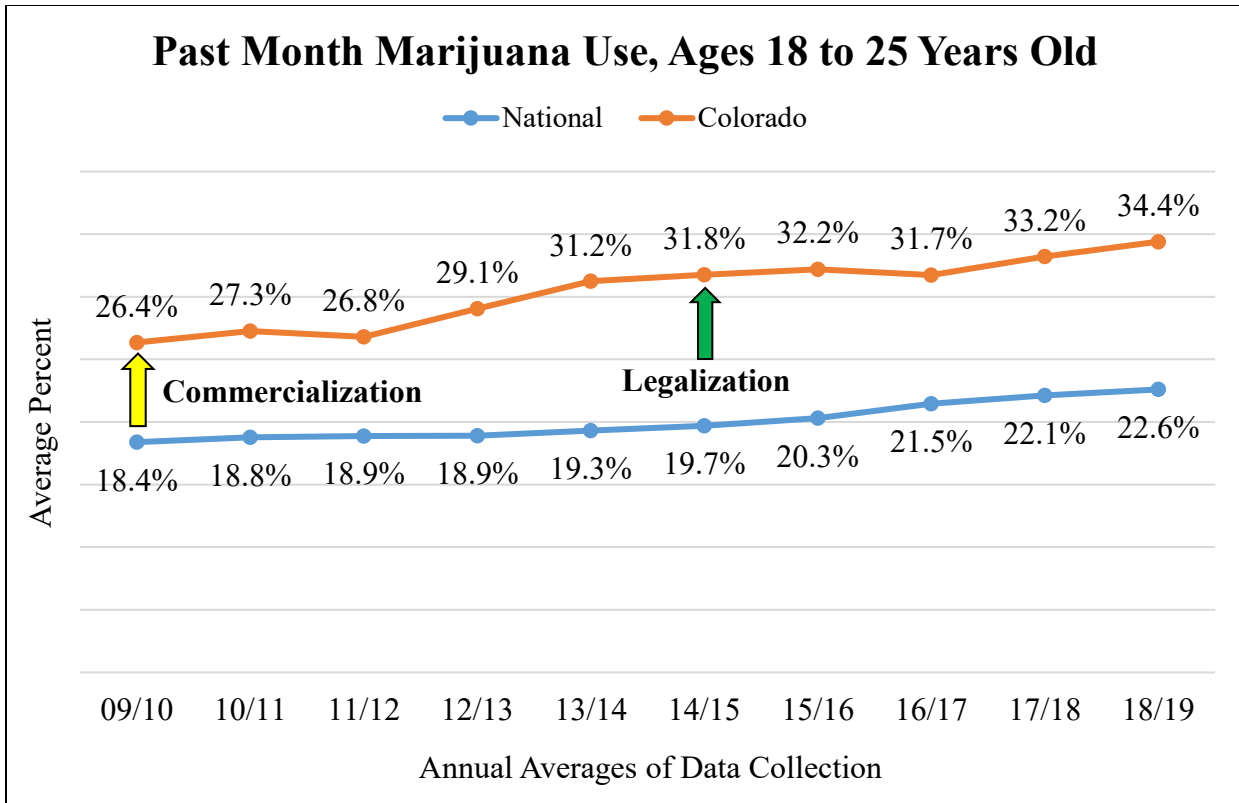
SOURCE: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019



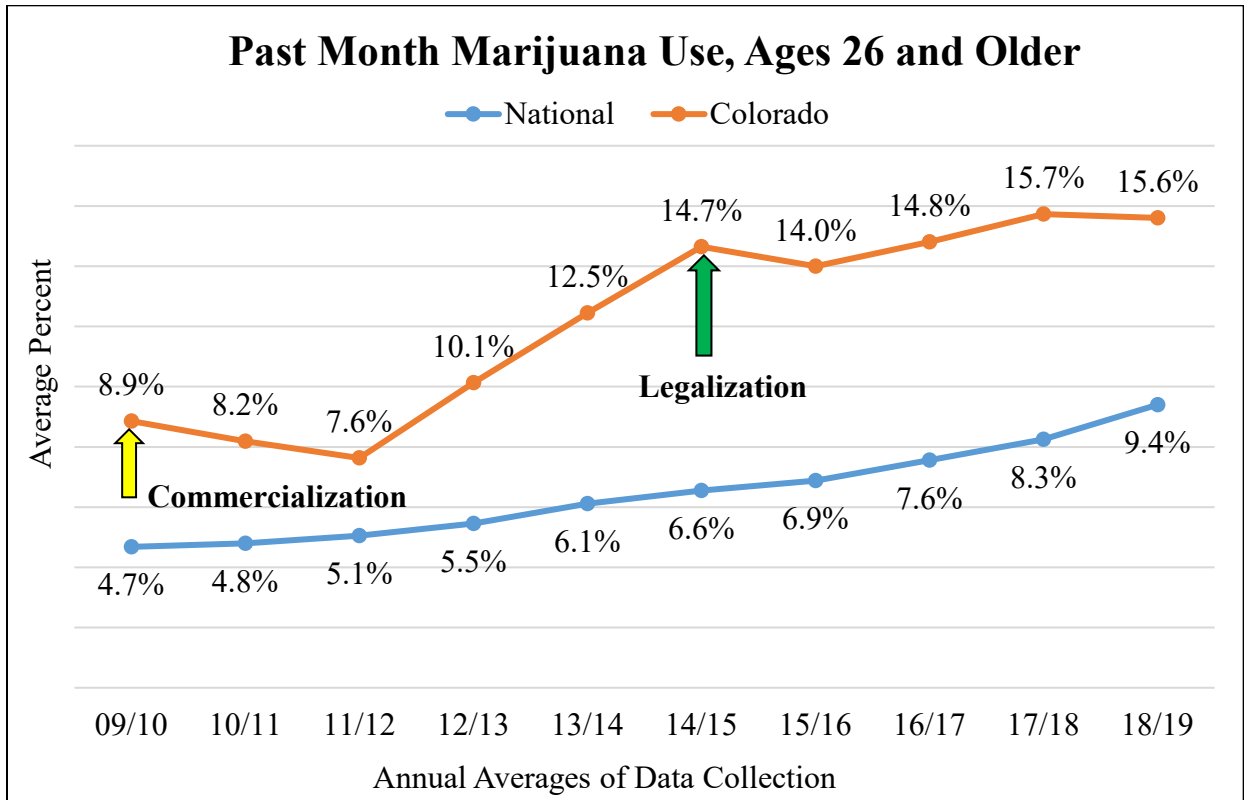
Source: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019

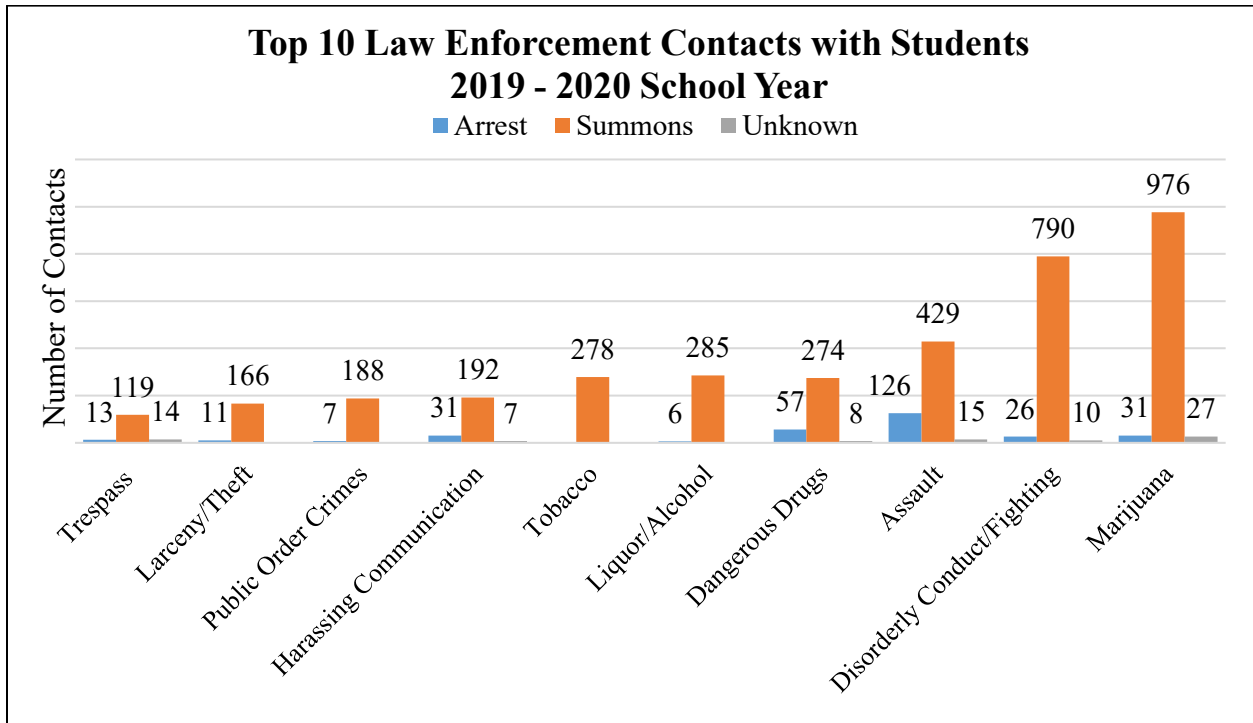


Source: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019



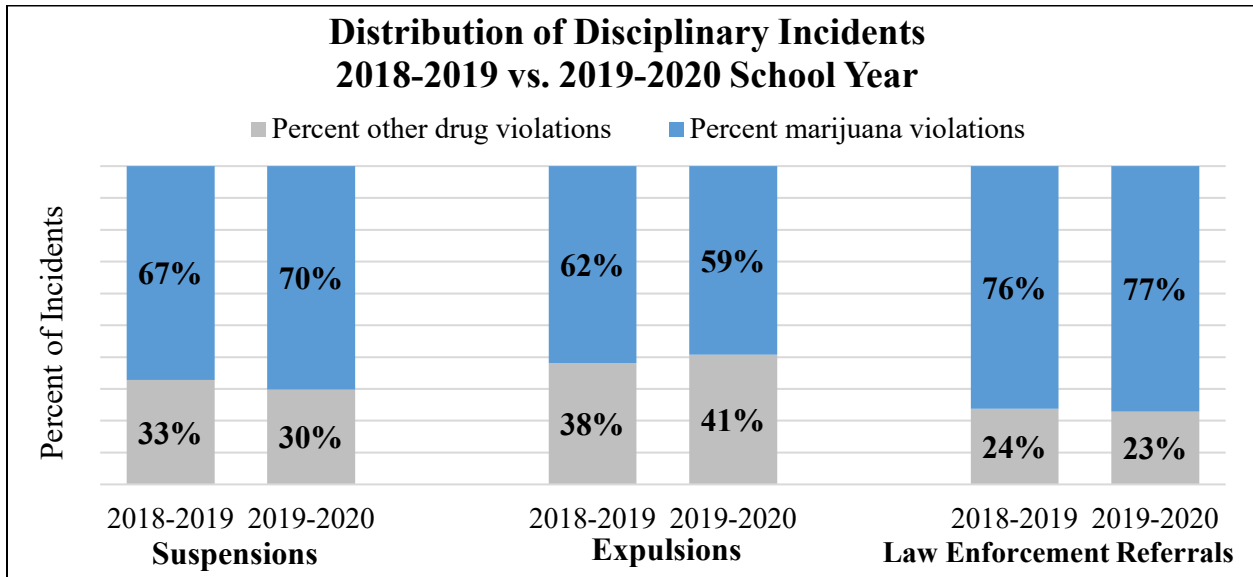
Source: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2018 and 2019

Marijuana in Schools



SOURCE: Colorado Division of Criminal Justice

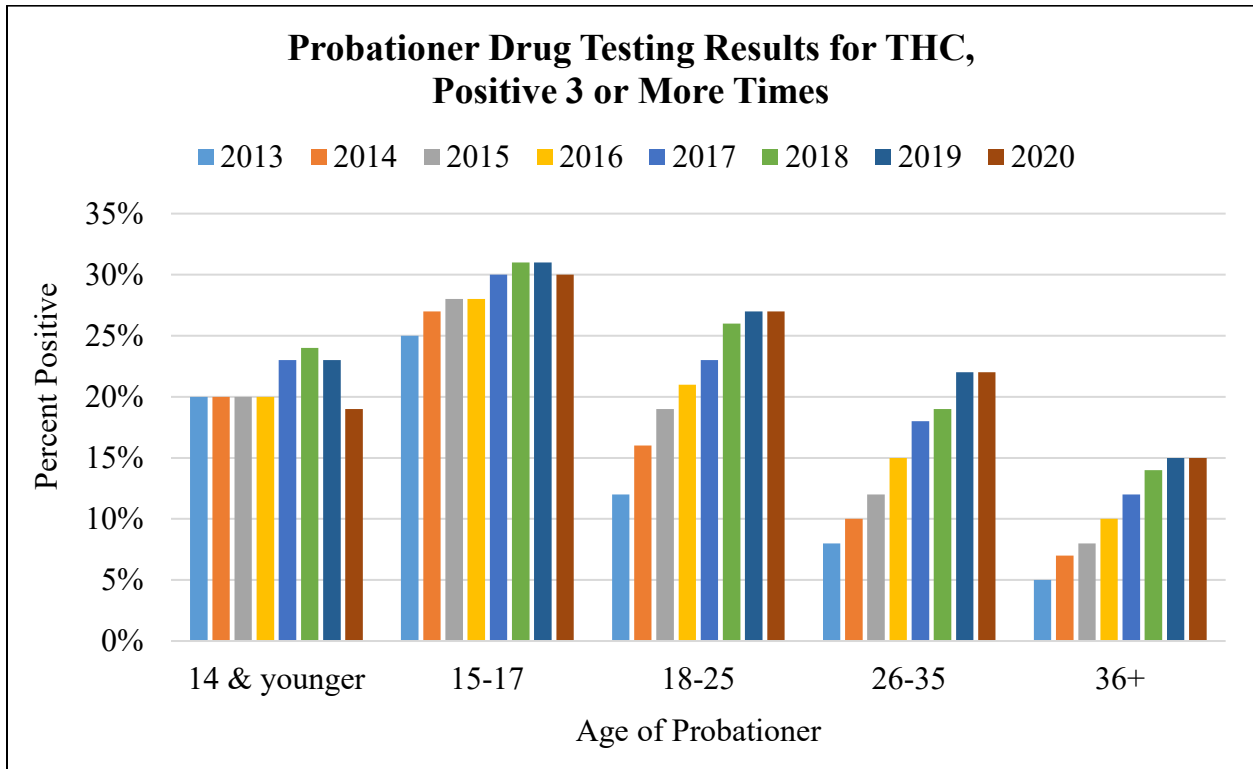
NOTE: The number of contacts from the 2019 to 2020 school year may not represent a complete school year due to the beginning of lockdowns associated with COVID-19 in March 2020.



SOURCE: Colorado Department of Education

NOTE: Law Enforcement Referrals may or may not have been in addition to another reported action taken (suspension, expulsion, or other).

Probationer Marijuana Use



SOURCE: Colorado State Judicial Branch, Division of Probation Services

NOTE: Data reflects drug test results for probationers required to undergo drug testing. This does not reflect all probationers in Colorado. Probationers who have a medical marijuana card are not prohibited from using marijuana while on probation. It is possible that some positive results may come from probationers using marijuana for medical reasons.

Marijuana Use Information

Analysis of Marijuana Use by College Students from 2008 to 2018

One of the largest questions after legalizing recreational marijuana was the impact on young adults across the country. A long-term study was created to compare marijuana use in states that passed recreational marijuana legalization (RML) compared to non-RML states. Researchers chose several post-secondary institutions and students between 18 to 26 years old were surveyed across ten academic years in 48 states. This resulted in seven RML states with nearly 235,000 participants from 135 institutions compared to 41 non-RML states with almost 600,000 students from 454 institutions.

The results indicated that “the 30-day prevalence of marijuana use increased more among college students exposed to RML relative to students attending college in non-RML states and students in RML states prior to legalization. These findings are generally consistent with those from prior studies of Oregon and Washington college students, but are a considerable extension, given that they are based on 135 institutions in seven RML states instead of one to two institutions in a single RML state. The mounting evidence for increases in college students’ marijuana use that has coincided with RML is all the more interesting in the context of the more mixed results regarding such changes among adolescents. For many young adults, the transition to college involves sudden declines in parental monitoring, exposure to older peer groups and a culture of heavy drinking and other substance use. Although heavy drinking by college students has declined nation-wide in recent years, the prevalence of marijuana use has increased” (Bae et al, 2021). Additionally, the increases in RML states were more pronounced in women, participants 21 years and older, and students living off-campus.

Source: Bae, H. and Kerr, D. (2021). *Marijuana use trends among college students in states with and without legalization of recreational use: initial and longer-term changes from 2008 to 2018*. *Addiction*, 115(6), 1115-1124.

Relationship between Neighborhood Disorder, Marijuana Use, and Life Expectancy for Young Men Involved in the Criminal Justice System

Researchers surveyed over 1,200 young males from the Crossroads study that are involved in the justice system to examine their perception of risk-taking relative to their expectations on life expectancy. In the study, the measurements were neighborhood disorder, life expectancy, substance use, offending, and risky sexual behavior. Specific to marijuana use, the results indicated that the young men living in more disordered neighborhoods used marijuana more frequently, different findings than binge drinking and cigarette use. No causal relationship was determined between life expectancy and marijuana use.

The authors stated in the conclusion, “a possible explanation for this finding is that adolescents do not perceive using marijuana as risky or harmful. Findings from the National Institute on Drug Abuse 2013 Monitoring the Future survey indicate that while cigarette use and alcohol use have steadily declined in recent years, rates of marijuana use have remained consistently high, in large part due to adolescents’ attitudes toward marijuana risks. Only 20.6% of 12th graders perceived occasional marijuana use as harmful and only 44.1% considered daily use to be detrimental (Johnston et al., 2014). If youth tend not to view marijuana as being harmful in the long run, then

it is likely that decisions to use marijuana are not informed by youths' expectations for their futures. That is, even among adolescents who expect long lives, they may be just as likely as those with short life expectancies to engage in marijuana use because they may not perceive it as a risky behavior" (Kan et al, 2020).

Source: Kan, E., Peniche, M., Steinberg, L., Knowles, A., Frick, P., and Cauffman, E. (2020). *Neighborhood disorder and risk-taking among justice-involved youth—the mediating role of life expectancy*. *Journal of Research on Adolescence*, 31(2), 282-298.

Examining the Validity of the Marijuana Gateway Hypothesis

Proposed during the 1970s, the marijuana gateway hypothesis was created to explain the escalation of risk from the use of tobacco and alcohol to marijuana, then to harder drugs. As a result of this hypothesis, marijuana use was harshly punished throughout the country even to today with many states legalizing recreational and medical marijuana. At this point, there has been a lack of research supporting the causal relationship between marijuana use and other drugs. The researchers in this study focused on further examining the relationship to determine the validity of the marijuana gateway hypothesis. While those who use marijuana before 21 were 157 times more likely to engage in subsequent hard drug use, most marijuana users never escalate to hard drug use. "Some studies have found moderate estimates wherein approximately 29% of marijuana users continue on to harder drug use" (Jorgensen and Wells, 2021). They state there must be a distinction between chronic users with more occasional users when examining the likelihood of escalating to harder drugs.

Data was gathered and analyzed from the National Longitudinal Study of Adolescent to Adult Health. The results showed a meaningful association between heavy marijuana use and light illicit drug use. "Considering the findings from all 18 tests together, it can be concluded that the hypothesis that marijuana is a gateway drug is unsupported. Summarily, if marijuana "really" is a gateway drug we would expect to see stronger and more consistent causal gateway effects" (Jorgensen and Wells, 2021). Additionally, the conclusion stated that if marijuana was to be considered a gateway drug that necessitates harsh punishments, the same would be needed for tobacco and alcohol.

Source: Jorgensen, C. and Wells, J. (2021). *Is marijuana really a gateway drug? A nationally representative test of the marijuana gateway hypothesis using a propensity score matching design*. *Journal of Experimental Criminology*, 17(3).

Changes in Marijuana Use from 2005 to 2018 across the United States

The study compares marijuana use by adults from 2005 to 2011 (pre-recreational marijuana legalization) to 2012 to 2018 (post-recreational marijuana legalization). Data was utilized from the US National Health and Nutrition Examination Survey (NHANES) from 2005 to 2018 across the country. While lifetime marijuana use and first use before the age of 18 was fairly consistent over the 14 years, there was a sizable increase in past-year marijuana use. This use was higher and more common for younger people, males, participants below the poverty line, non-Hispanic blacks. Despite this, the increase in past-year use increased across all demographics including education, race, gender, and income.

Source: Mitchell, W., Bhatia, R., and Zebardast, N. (2020). *Retrospective cross-sectional analysis of the changes in marijuana use in the USA, 2005–2018*. *BMJ Open*, 1-6.

Section III: Public Health

Some Findings

- Marijuana *only* exposures **increased 185%** from 2013 when recreational marijuana was legalized compared to 2020.
- Treatment for marijuana use for all ages **decreased 34%** from 2013 to 2020.
- The percent of suicide incidents in which toxicology results were positive for marijuana has **increased** from **14%** in 2013 to **29%** in 2020.

Definitions by Rocky Mountain HIDTA

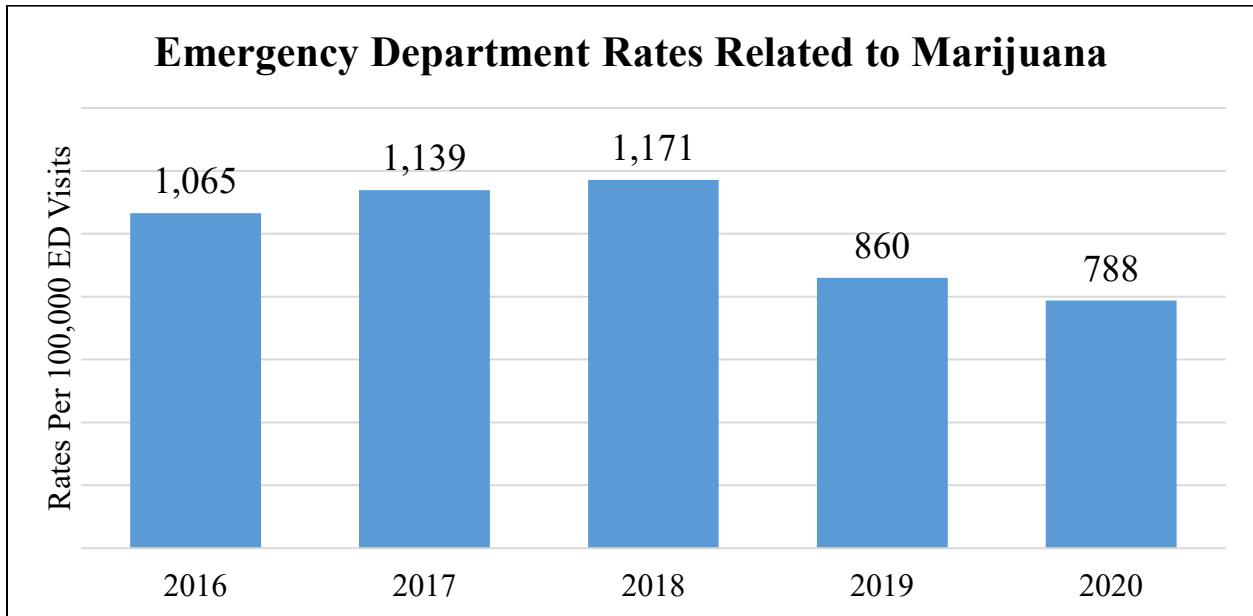
Marijuana-Related: Also referred to as “marijuana mentions.” Data could be obtained from lab tests, patient self-admission or some other form of validation obtained by the provider. Being marijuana-related does not necessarily prove marijuana was the cause of the emergency department admission or hospitalization.

International Classification of Disease (ICD): A medical coding system used to classify diseases and related health problems.

**In 2015, ICD-10 (the tenth modification) was implemented in place of ICD-9. Although ICD-10 will allow for better analysis of disease patterns and treatment outcomes for the advancement of medical care, comparison of trends before and after the conversion can be made difficult and/or impossible. The number of codes increased from approximately 13,600 codes to approximately 69,000 codes. For this reason, emergency department visits and hospitalizations related to marijuana use were restricted to 2016 to 2020 in this report.

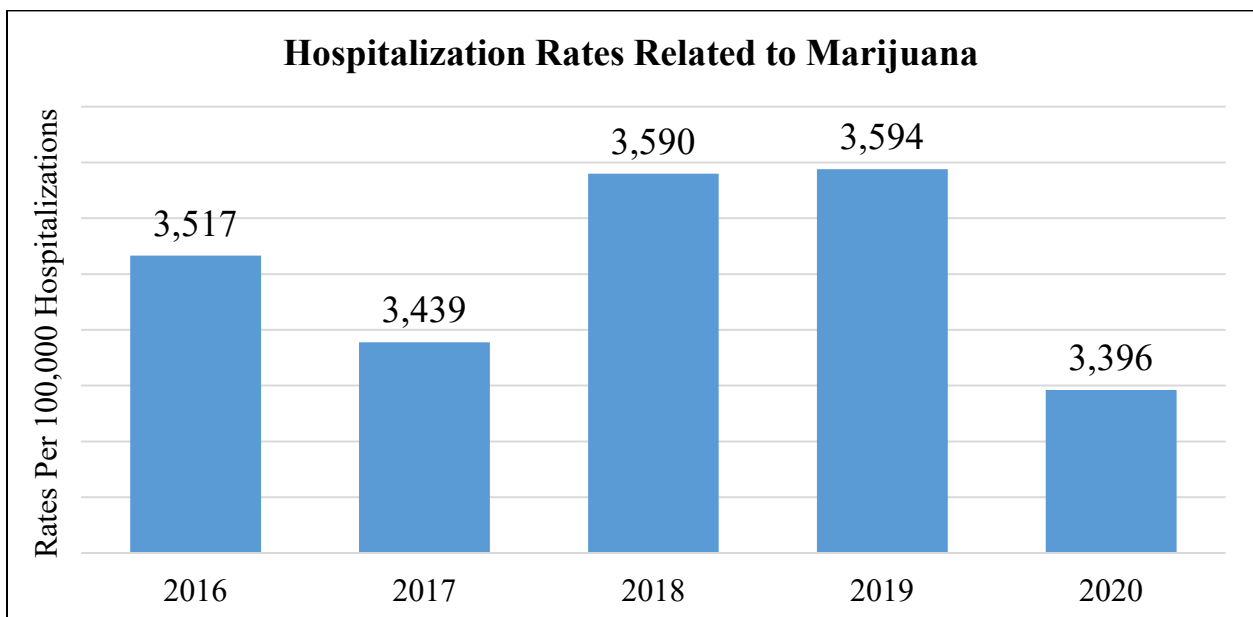
For more information regarding public health research gaps and data quality issues, please visit <https://marijuanahealthinfo.colorado.gov/research-gaps>.

Emergency Department Data



SOURCE: Emergency Department Discharge Dataset, as analyzed by the Colorado Department of Public Health and Environment; 2016-2020

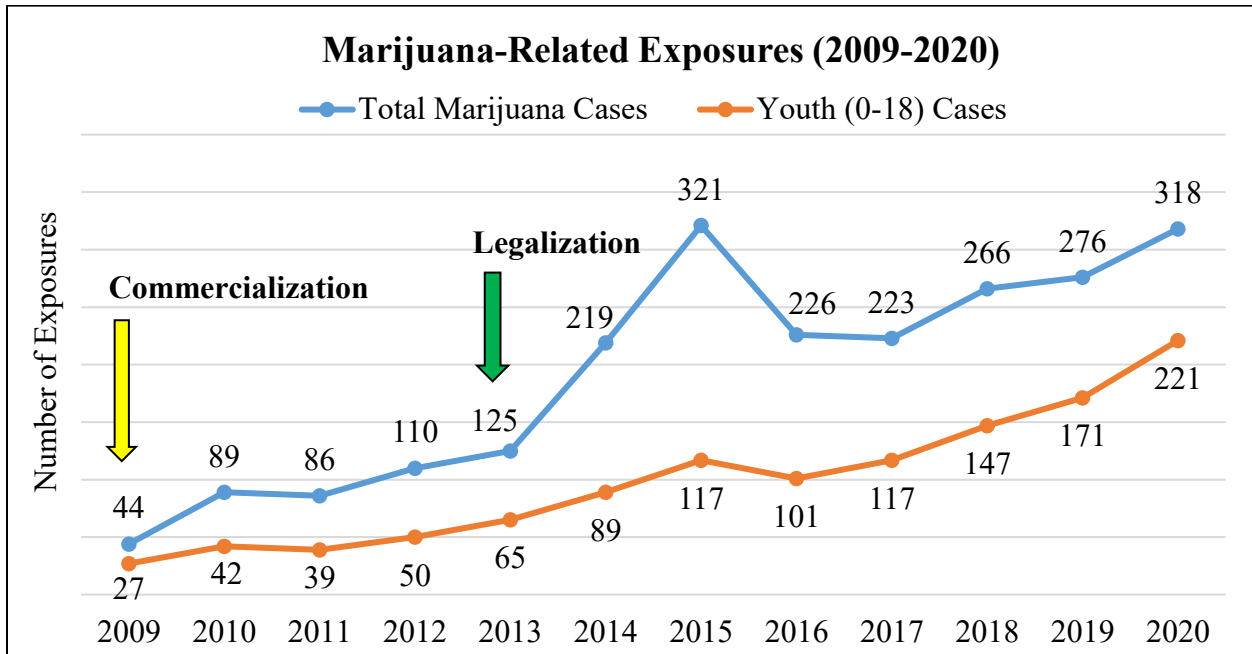
NOTE: Due to changes in the way the hospitalizations and emergency department visits data were coded, data before 2015 was not included for trend analysis.



SOURCE: Emergency Department Discharge Dataset, as analyzed by the Colorado Department of Public Health and Environment; 2016-2020

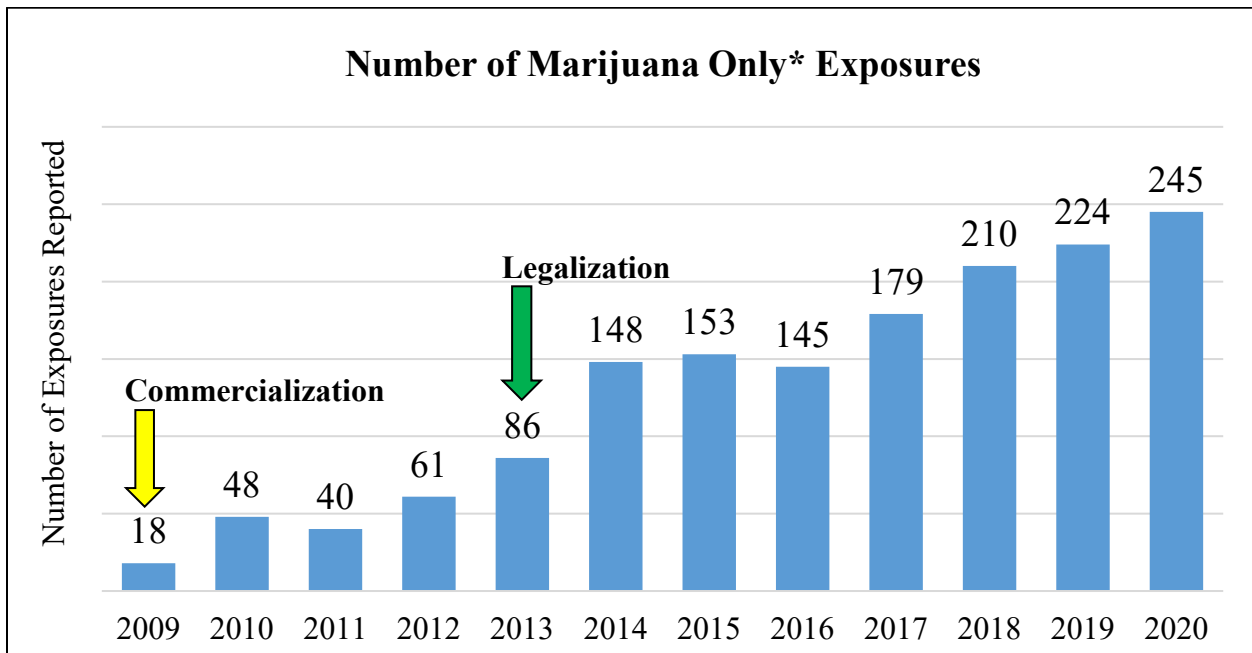
NOTE: Due to changes in the way the hospitalizations and emergency department visits data were coded, data before 2015 was not included for trend analysis.

Poison Control/Marijuana Exposure Data



SOURCE: Rocky Mountain Poison and Drug Center

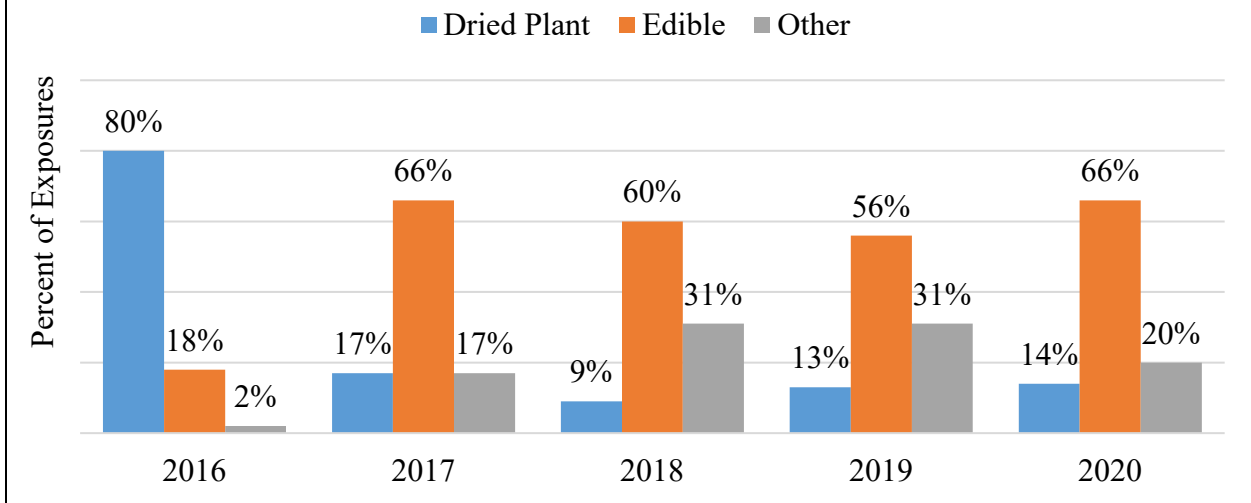
NOTE: Total marijuana-related exposure cases include unknown ages.



SOURCE: Rocky Mountain Poison and Drug Center

***NOTE:** Marijuana was the only substance referenced in the call to the poison and drug center.

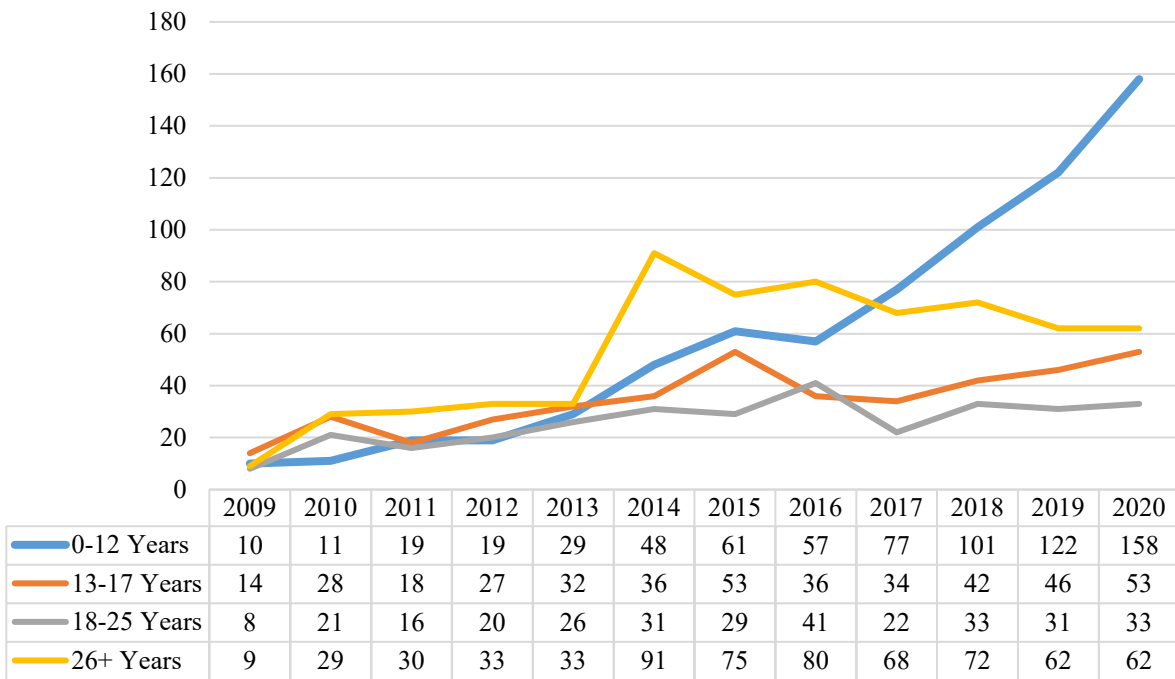
Percent of Marijuana Exposures 0-8 Year Olds, By Marijuana Type (2016-2020)



SOURCE: Rocky Mountain Poison and Drug Center

NOTE: The code for marijuana edibles did not go into effect until 2016. Therefore, any cases of edible marijuana exposure which occurred prior to 2016 were coded under “dry plant.” Other marijuana includes oral pills/capsules, concentrated extracts (to include oils and tinctures), topical preparations, marijuana devices, and unknown/other forms of marijuana.

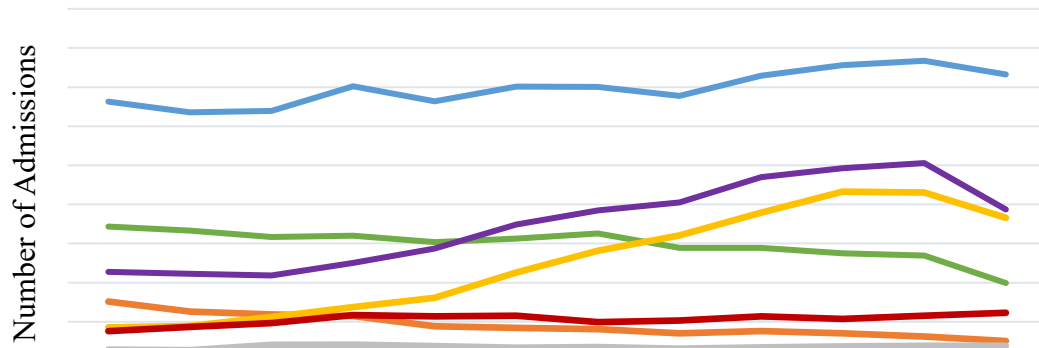
Marijuana-Related Exposures by Age Range (2009-2020)



SOURCE: Rocky Mountain Poison and Drug Center

Treatment Data

Drug Type for Treatment Admissions, All Ages

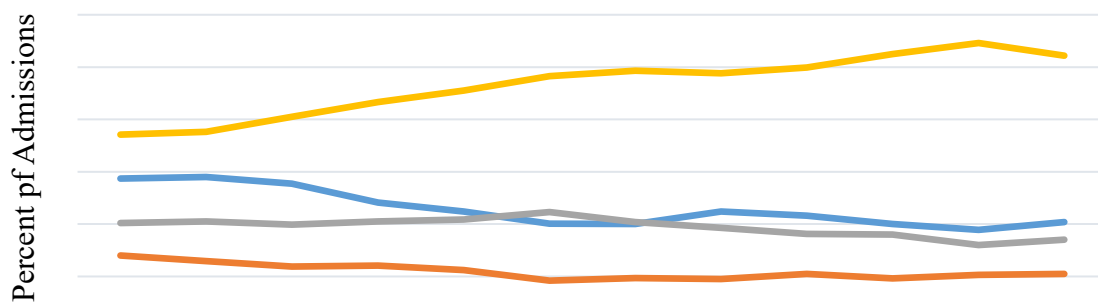


	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Marijuana	6,868	6,665	6,342	6,408	6,065	6,257	6,520	5,783	5,785	5,498	5,394	3,980
Cocaine	3,034	2,523	2,380	2,288	1,775	1,681	1,618	1,414	1,518	1,402	1,252	1,017*
Meth	4,557	4,450	4,368	5,007	5,746	6,972	7,700	8,110	9,389	9,859	10,115	7,743
Heroin	1,713	1,790	2,237	2,746	3,225	4,520	5,634	6,420	7,581	8,655	8,610	7,323*
Rx Opioids	1,522	1,739	1,934	2,339	2,277	2,304	1,987	2,059	2,271	2,138	2,307	2,460
Alcohol	13,263	12,710	12,788	14,035	13,277	14,023	14,013	13,544	14,587	15,124	15,345	14,653
Other	572	548	827	830	761	667	710	620	692	734	773	768

SOURCE: Colorado Department of Health Services, Office of Behavioral Health

***NOTE:** Treatment admissions for cocaine and heroin in 2020 do not include the 12-17 age group as there were less than 30 admissions and were therefore omitted.

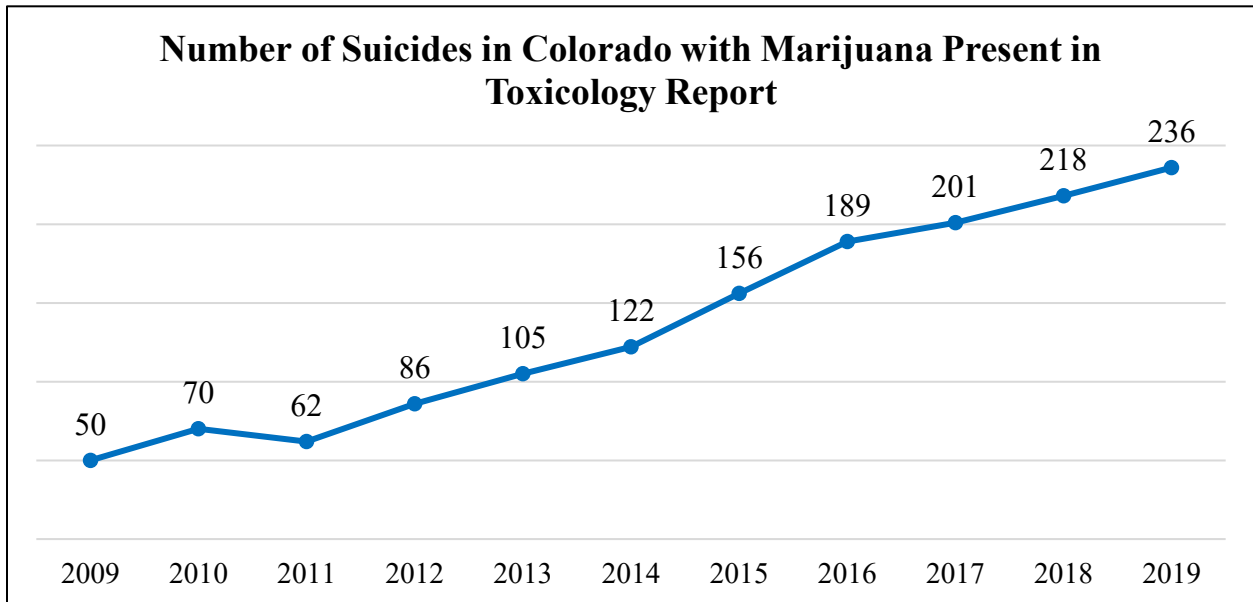
Percent of Marijuana Treatment Admissions by Age Group



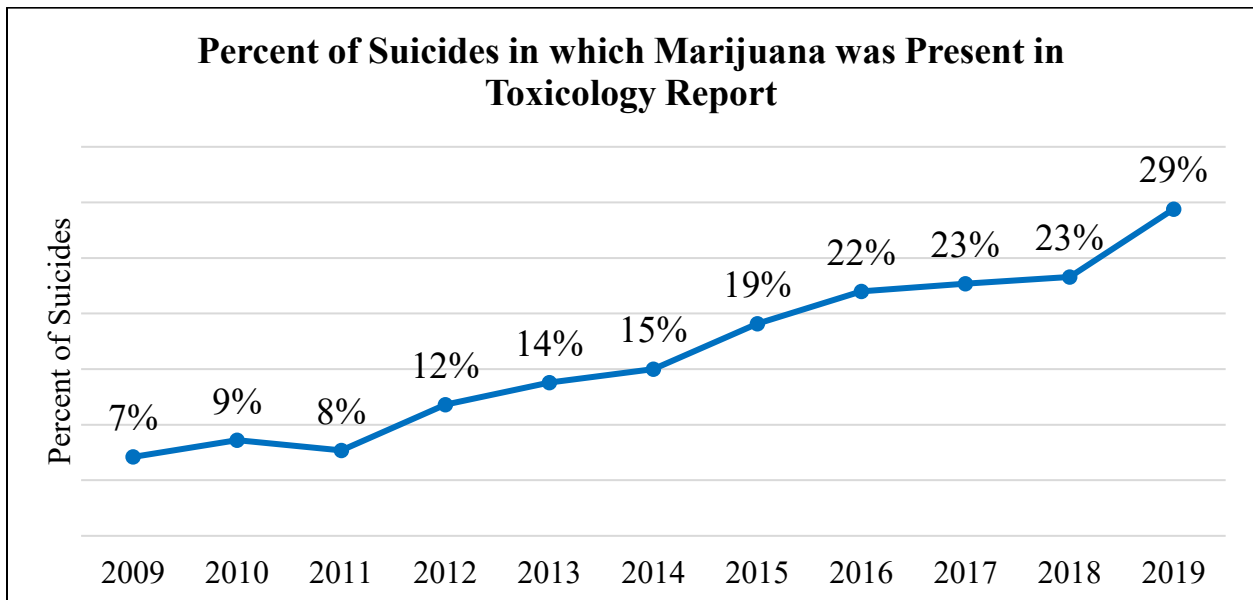
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
12-17	28.7	29.0	27.7	24.1	22.4	20.1	20.0	22.4	21.6	20.0	18.9	20.4
18-20	14.0	12.9	11.9	12.1	11.2	9.2	9.7	9.5	10.5	9.6	10.3	10.5
21-25	20.2	20.5	19.9	20.5	20.9	22.3	20.4	19.3	18.1	18.0	16.0	17
26+	37.1	37.6	40.5	43.3	45.5	48.3	49.3	48.8	49.9	52.5	54.6	52.2

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Treatment Episode Data Set (TEDS). Based on administrative data reported by states to TEDS pulled on July 8, 2021.

Suicide Data



SOURCE: CDPHE, Colorado Violent Death Reporting System

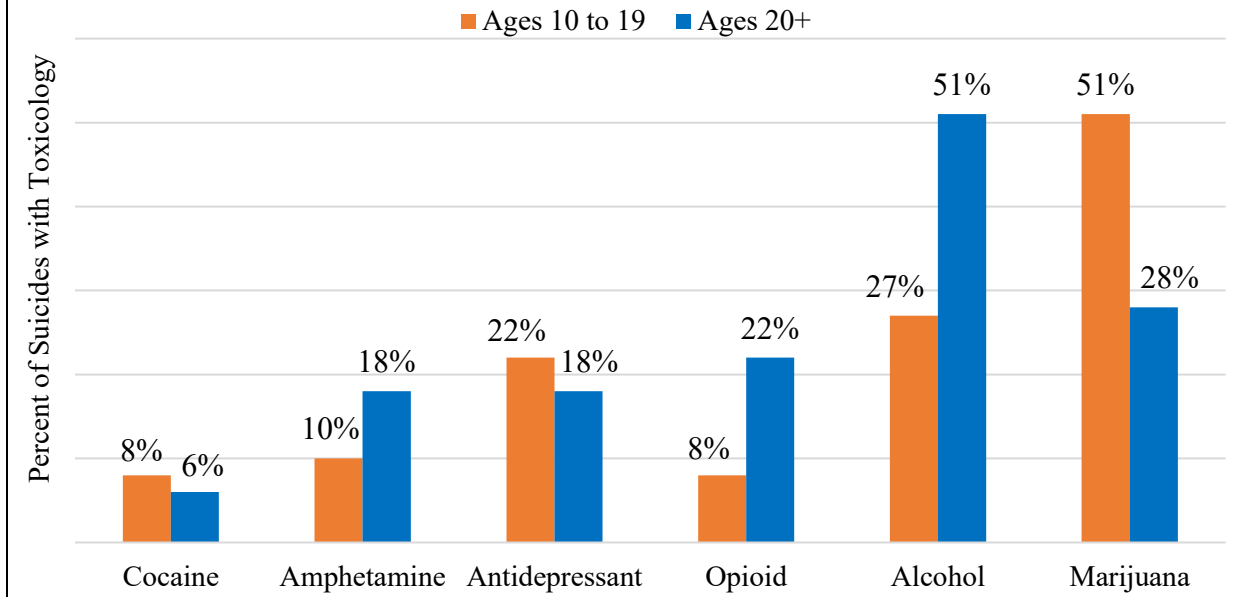


SOURCE: CDPHE, Colorado Violent Death Reporting System

NOTE: Toxicology is not available for every suicide. Only those suicides with toxicology available are represented above. Due to an 18-month lag in detailed suicide circumstances and toxicology information from coroner and law enforcement records, 2019 is the most recent year available.

NOTE: Toxicology results were available for 62% of suicides from 2019. As a result, there may be underrepresentation in the numbers and percentages presented.

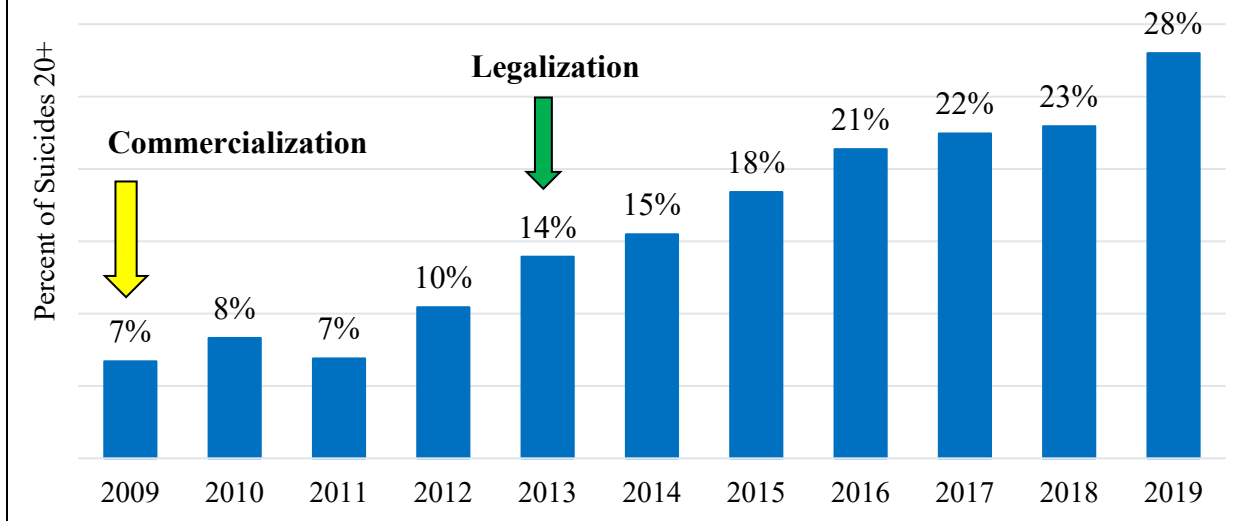
Suicide Toxicology Results by Age Group, 2019



SOURCE: CDPHE, Colorado Violent Death Reporting System

NOTE: Toxicology results were available for 62% of suicides from 2019. As a result, there may be underrepresentation in the numbers and percentages presented.

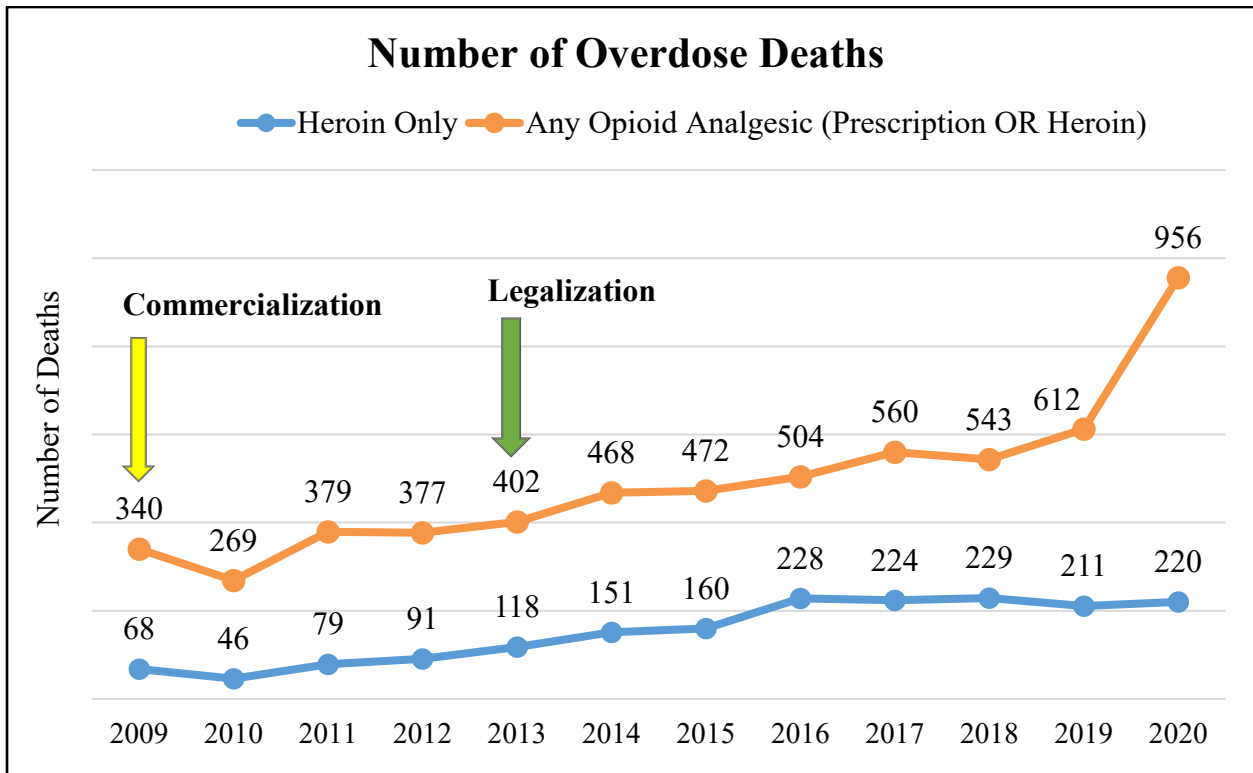
Out of All Suicides Ages 20 and Older, The Percent Positive for Marijuana



SOURCE: CDPHE, Colorado Violent Death Reporting System

NOTE: Toxicology results were available for 62% of suicides from 2019. As a result, there may be underrepresentation in the numbers and percentages presented.

Colorado Opioid Overdose Deaths



Source: CDPHE, Vital Statistics Program

This data is included in response to reports of declining opioid overdose deaths post-marijuana legalization.

NOTE: Heroin cause of death codes include T40.1. Any Opioid Analgesic (prescription or heroin) cause of death codes include T40.1-T40.4

Public Health Information

Impact of Licensed and Unlicensed Cannabis Retailers in California

California legalized recreational marijuana in 2016, which resulted in the establishment of unlicensed retailers until the issuance of cannabis retail licenses at the end of 2017. For example, in Los Angeles County, there are 37 licensed retailers compared to 92 unlicensed retailers. This can create problems for regulation as unlicensed locations “have been reported to engage in illegal business practices that can compromise public health and encourage underage use, including selling products that exceed the legal THC limit, selling counterfeit products that contain pesticides, allowing consumption of cannabis in retail stores, not imposing daily limits on purchases, staying open late at night, and selling products that are attractive to youth and lack child-resistant packaging” (Unger et al, 2020).

The results indicated that “neighborhoods with only licensed retailers represented 8% of the California population, neighborhoods with only unlicensed retailers represented 17% of the California population, and neighborhoods with both licensed/unlicensed retailers represented 18% of the California population. Of all neighborhood types, neighborhoods with only unlicensed retailers had the lowest proportion of non-Hispanic whites (25%) and the highest proportion of Hispanics (52%). However, the highest proportions of African Americans (9%), Asian Americans (15%), and individuals living in poverty (19%) were in neighborhoods with both licensed/unlicensed retailers” (Unger et al, 2020). Residents living near unlicensed retailers face greater public health risks due to the lack of regulation of the products and the authors recommend greater enforcement of these dangerous practices.

Source: Unger, J., Vos, R., Wu, J., Hardaway, K., Li Sarain, A., Soto, D., Rogers, C., and Steinberg, J. (2020). *Locations of licensed and unlicensed cannabis retailers in California: A threat to health equity*. Preventive Medicine Reports, 19, 101165-101173.

Mixed Findings for the Public Health Effects of Medical Marijuana Treatment

Researchers sought to examine the public health effects from the use of medical marijuana on various conditions- amyotrophic lateral sclerosis, autism, cancer, chronic noncancer pain, Crohn’s disease, epilepsy, glaucoma, human immunodeficiency virus/AIDS, multiple sclerosis (MS), Parkinson’s disease, and posttraumatic stress disorder. Across the 33 states in which medical marijuana is legal, there are over 50 medical conditions that have qualified to be treated through the use of medical marijuana. Nationwide, 6.2% of people use medical marijuana and 3.6% use both medical and recreational marijuana. A systematic review was conducted for studies that took place from May 2016 to October 2019.

The results indicated that “there is conclusive or substantial evidence for cannabis in treating chronic noncancer pain, chemotherapy-induced nausea and vomiting (oral cannabinoids), and MS spasticity symptoms (via oral cannabinoids). In addition, limited evidence was reported for the efficacy of cannabis and cannabinoids for the purposes of increasing appetite and decreasing weight loss in patients with HIV/AIDS, improving clinician measures of MS spasticity symptoms (specifically, via oral cannabinoids), and improving symptoms of PTSD (specifically, with

nabilone)” (Jugl et al, 2021). However, there was insufficient evidence to support evidence of medical marijuana improving glaucoma symptoms. In addition, studies showed neither support or opposition for indications such as “cancer (cannabinoids), cancer-associated anorexia-cachexia syndrome and anorexia nervosa (cannabinoids), symptoms of irritable bowel syndrome (dronabinol), epilepsy (cannabinoids), symptoms associated with ALS, or Parkinson’s disease-related symptoms or levodopa-induced dyskinesia (cannabinoids)” (Jugl et al, 2021).

Source: Jugl, S., Okpeku, A., Costales, B., Morris, E., Alipour-Haris, G., Hincapie-Castillo, J., Stetten, N., Sajdeya, R., Keshwani, S., Joseph, V., Zhang, Y., Shen, Y., Adkins, L., Winterstein, A., and Goodin, A. (2021). *A mapping literature review of medical cannabis clinical outcomes and quality of evidence in approved conditions in the USA from 2016 to 2019*. *Medical Cannabis and Cannabinoids*, 4(1), 21-42.

Analysis of Pre-Existing Factors and Experiences to Marijuana Use During Pregnancy

Similar to cigarette use during pregnancy, marijuana can have physical effects on the fetus such as anemia, low birth weight, and more time spent in the neonatal intensive care unit after birth. Although women have used marijuana to assist with nausea in the first trimester, some medical professionals have expressed concerns of this practice. A study was conducted and found 29.6% of women used marijuana prior to their first prenatal visit. Additionally, the participants in the study who used marijuana while pregnant were more likely to be unemployed, have low educational attainment, use tobacco and alcohol, and experience depression. The rate of women using marijuana decreased across pregnancy terms.

The authors of this study recruited 101 pregnant participants in Indiana who used the WIC Food and Nutrition Service. The main measures were childhood adversity, interpersonal violence, cigarette use, and marijuana use. Of the participants, 71% experienced childhood adversity like physical abuse, 28% used at least one cigarette a day, and 7% used marijuana during pregnancy. Results indicated a strong association between marijuana use during pregnancy and sexual interpersonal violence.

The researchers concluded “this study suggests that a comprehensive assessment of women’s history of exposure to violence provides insight into which women may have the most difficulty with unassisted substance cessation in the prenatal period—above and beyond already known risk factors, including sociodemographic characteristics and pre-pregnancy smoking behaviors. It could be that women who have experienced recent IPV and past childhood adversity may experience a higher general stress burden, making cessation more difficult. Providing better intervention and support around smoking and marijuana cessation for women exposed to violence is therefore a critical need, even among groups that are at a generally high sociodemographic risk” (Miller-Graff et al, 2021).

Source: Miller-Graff, L., Howell, K., Grein, K., and Keough, K. (2021). *Women’s cigarette and marijuana use in pregnancy: identifying the role of past versus recent violence exposure*. *Journal of Interpersonal Violence*, 36(7-8), NP3983-NP3998.

Section IV: Black-Market

Some Findings

- RMHIDTA Colorado Drug Task Forces (10) conducted **294 investigations** of black-market marijuana in Colorado resulting in:
 - **168** felony arrests
 - **5.54** tons of marijuana seized
 - **86,502** marijuana plants seized
 - **21** different states the marijuana was destined
- Seizures of marijuana reported to the El Paso Intelligence Center (EPIC) in Colorado **increased 48%** from an average of 174 parcels (2009-2012) when marijuana was commercialized to an average of 257 parcels (2013-2020) during the time recreational marijuana become legalized.

Definitions by Rocky Mountain HIDTA

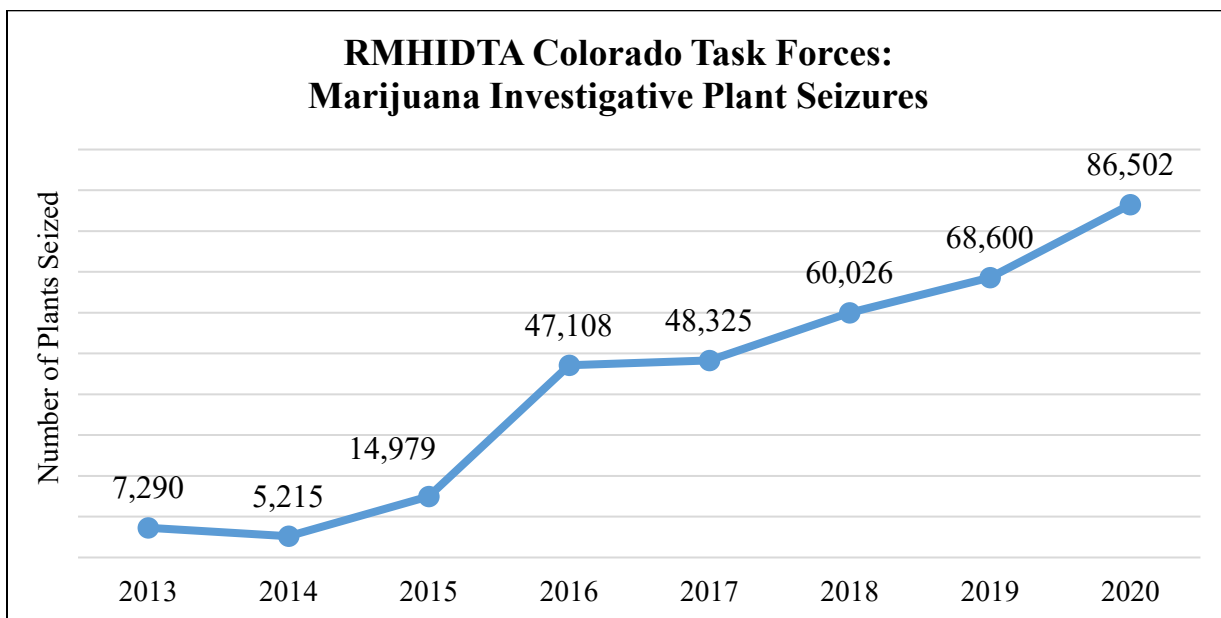
Colorado Marijuana Investigations: RMHIDTA Colorado drug task forces investigating individuals or organizations involved in illegally selling Colorado marijuana, both within and outside of the state. These investigations only include those reported by the ten RMHIDTA drug task forces.

Colorado Marijuana Interdictions: Interdictions include incidents where drugs are being transported, generally by vehicle or parcel, and the shipment is randomly seized by law enforcement. Interdictions are made by Colorado State Patrol.

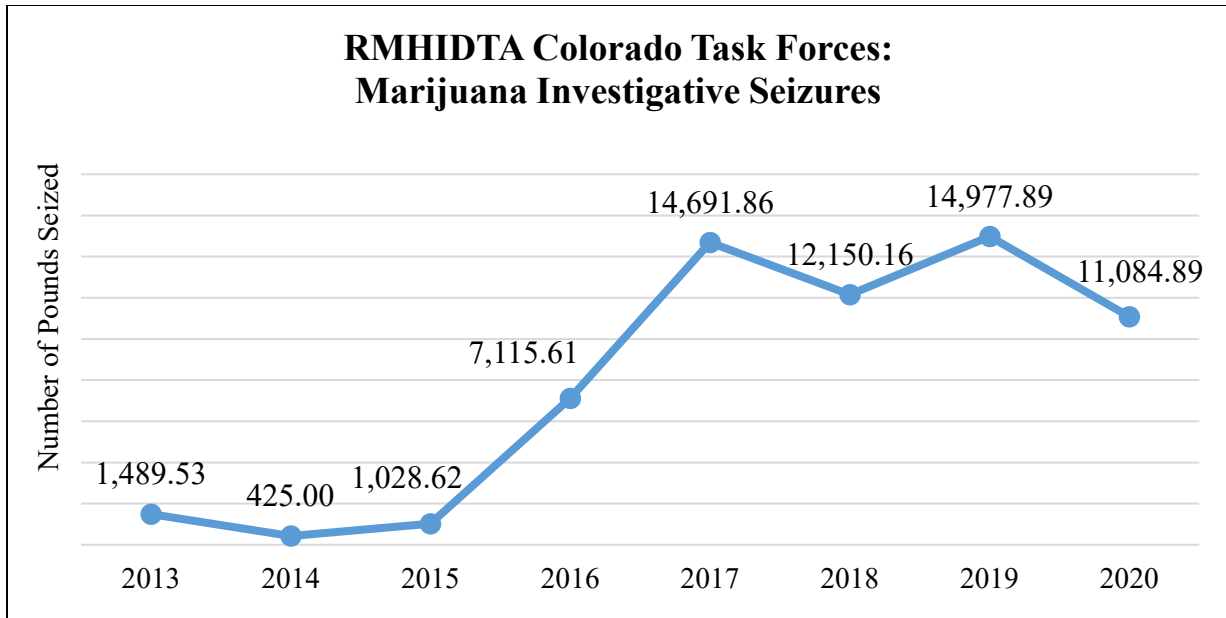
Task Force Investigations

Rocky Mountain HIDTA Colorado Task Forces			
	2018	2019	2020
Number of Completed Investigations	257	278	294
Number of Felony Arrests	192	237	168
Pounds of Bulk Marijuana Seized	12,150 (6.1 tons)	14,978 (7.5 tons)	11,085 (5.5 tons)
Number of Plants Seized	60,026	68,600	86,502
Number of Edibles Seized	2,894	15,025	4,202
Pounds of Hash/THC Concentrate Seized	319	86	626
Different States to Which Marijuana was Destined	25	29	21

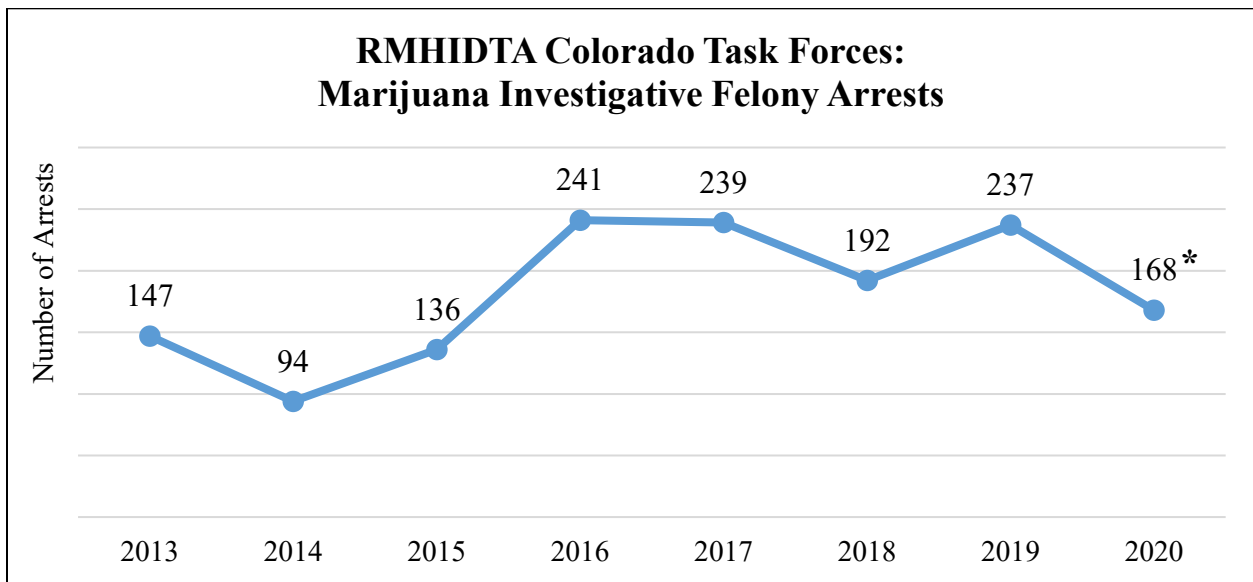
Task force data only includes completed investigations reported by the RMHIDTA Colorado Investigative Drug Task Forces. It is unknown how many of these types of investigations were completed by non-RMHIDTA Colorado drug units or task forces.



SOURCE: Rocky Mountain HIDTA Performance Management Process (PMP) Data



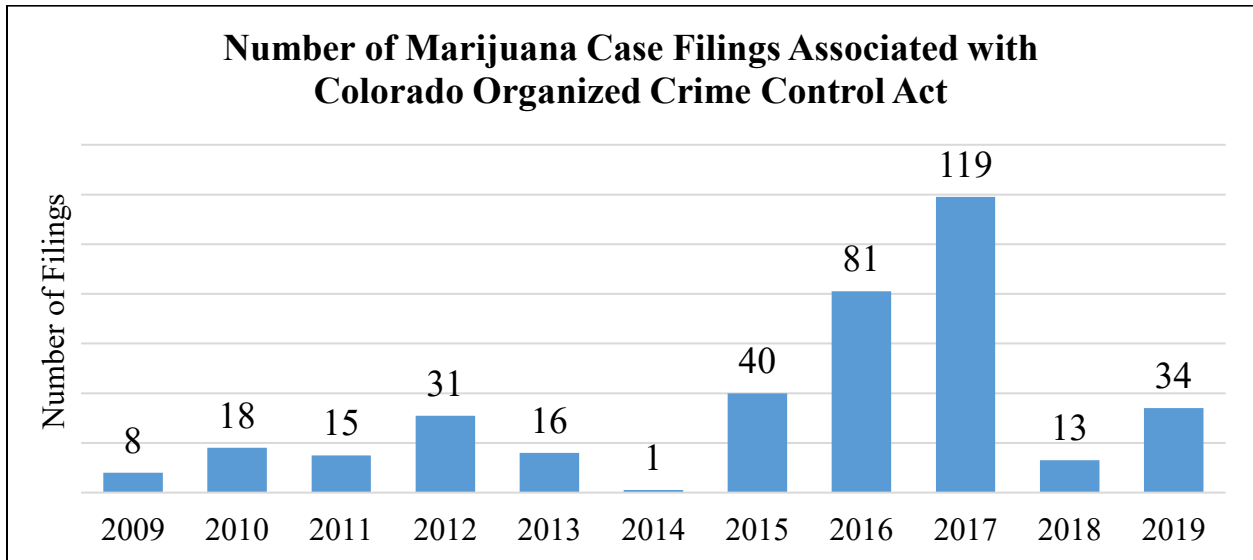
SOURCE: Rocky Mountain HIDTA Performance Management Process (PMP) Data



SOURCE: Rocky Mountain HIDTA Performance Management Process (PMP) Data

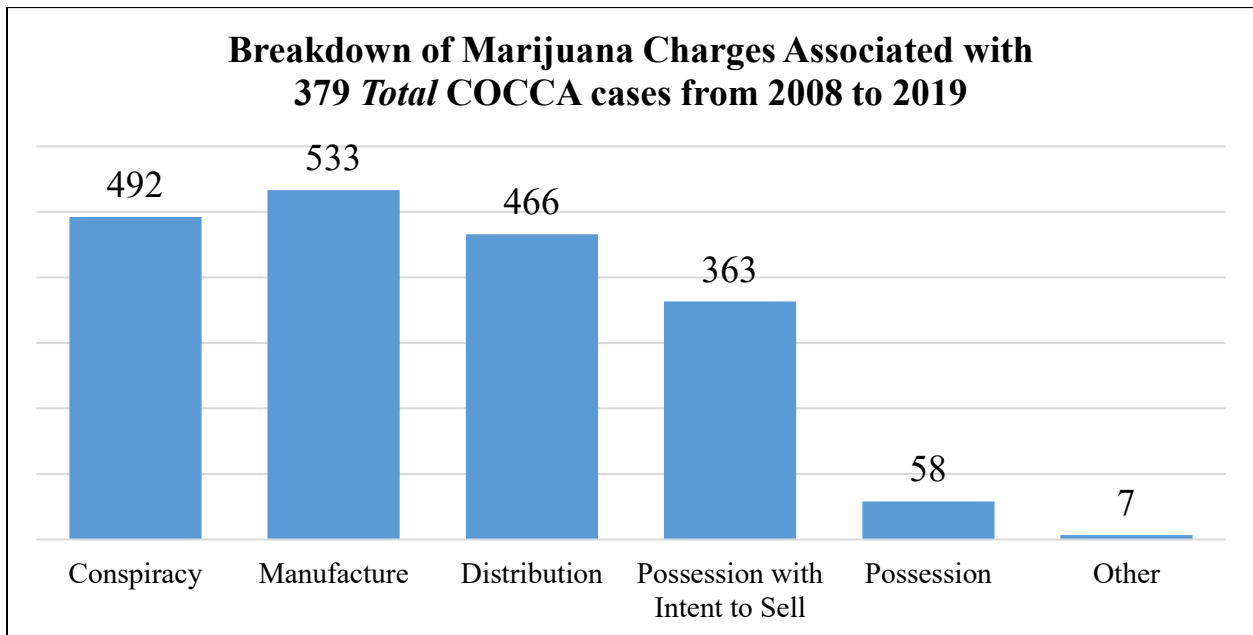
*** NOTE:** In 2020, arrest numbers were impacted by the COVID-19 pandemic's impact of the local, state, and federal judicial systems.

Colorado Organized Crime Control Act Filings



SOURCE: Colorado Department of Public Safety, Division of Criminal Justice, Office of Research and Statistics

Colorado Organized Crime Control Act (COCCA) filings are conspiracy cases in which there is potential for a larger sentence than other types of drug filings.

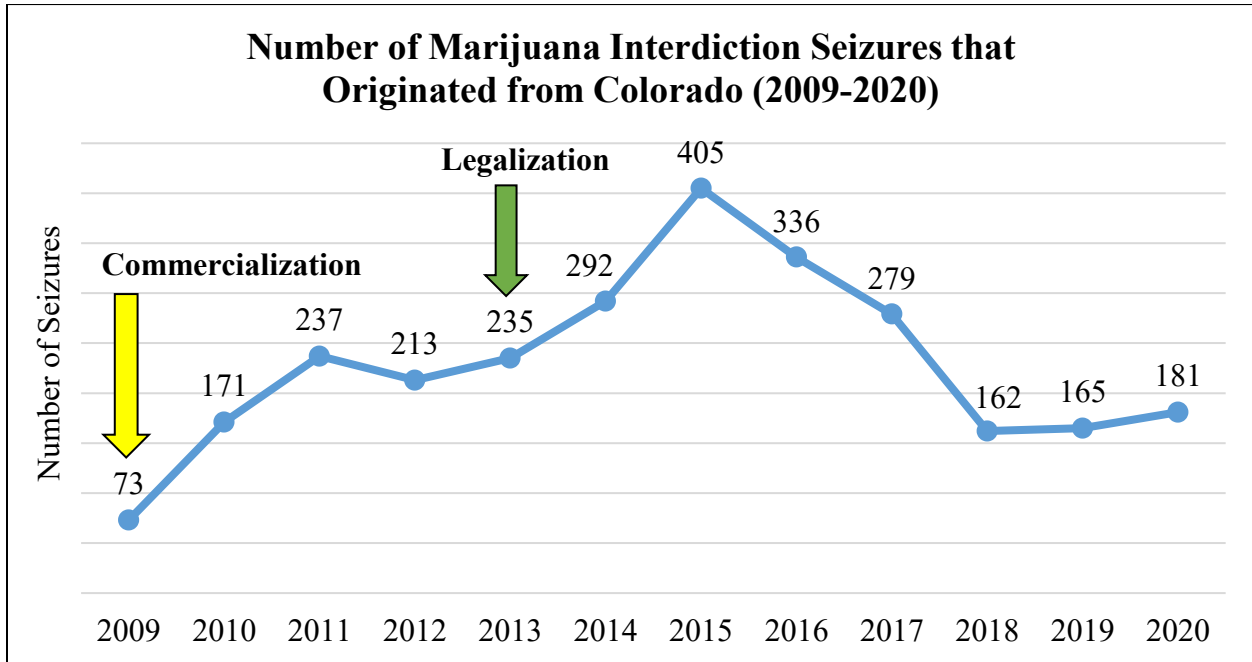


SOURCE: Colorado Department of Public Safety, Division of Criminal Justice, Office of Research and Statistics

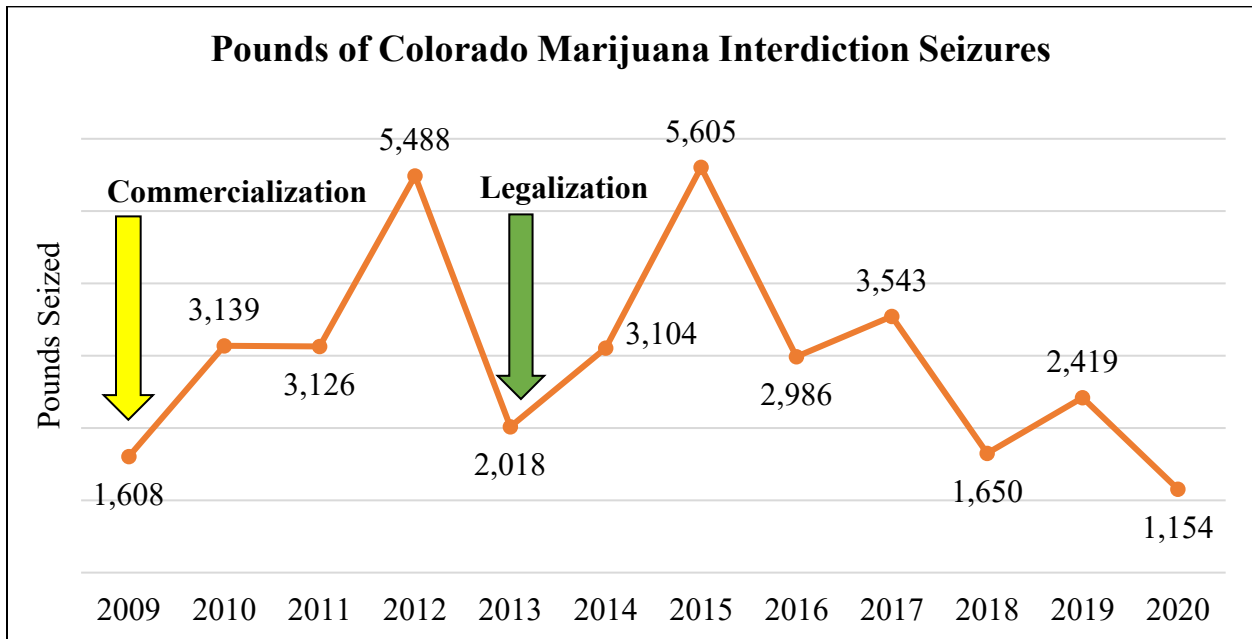
NOTE: The breakdown is more than the 379 total COCCA cases as there can be multiple charges associated with each case.

Highway Interdiction Data

NOTE: The charts below only include cases where Colorado marijuana was actually seized and reported. It is unknown how many Colorado marijuana loads were not detected or, if seized, were not reported. These are roadside interdictions voluntarily reported by state highway patrol to EPIC.



SOURCE: EPIC, National Seizure System, as of July 2021



SOURCE: EPIC, National Seizure System, as of July 2021

Black Market Information

Black-Market Marijuana Continues After Legalization

Despite the legalization of recreational marijuana in Colorado, the black-market marijuana continues to thrive. In 2019, federal and local law enforcement conducted the largest marijuana bust in the history of Colorado- raids across 250 homes and businesses, dozens of arrests, over 80,000 marijuana plants, and nearly \$2.2 million in assets. The base of this operation was buying suburban homes in the Denver Metro area with large, unfinished basements for the cultivation of thousands of plants, operating under the radar in plain sight. Then, the money was laundered through family restaurants by multiple Chinese drug trafficking organizations.

There is difficulty, however, in fully assessing the size of the black market as all the efforts are “underground” and not well known. It has been established by the Drug Enforcement Administration that well-established drug trafficking organizations are able to generate millions of dollars through the sale of up 1,800 pounds of marijuana a year based on 100 plants grown. This problem has resulted in the creation of the Illicit Market Marijuana Team within the Colorado Bureau of Investigations. The solution to combating the black market is split between those who believe law enforcement needs more resources with those who feel greater legalization and lower prices in the legal market could have the most impact.

Source: Tabachnik, S. (2021, June 20). *Black market marijuana grows are popping up faster than law enforcement can take them down. But is legalization the cause?* Denver Post. Retrieved from <https://www.denverpost.com/2021/06/20/black-market-marijuana-colorado-chinese-crime-rings/>

Perceptions from Marijuana Users of “Legal” and “Illegal” Markets

While legalization of recreational marijuana is expected to decrease the black market in these states, this is not always the case. After legalization, the retail price of marijuana decreased by 62% in Colorado from 2014 to 2017. While the prices also dropped in Washington and Oregon, it was a lower decline than Colorado. Some studies have indicated that buyers may be willing to pay a higher price for a legal purchase as well as high quality products. For some buyers though, the pre-existing relationship with their supplier may continue to connect them to the illegal market.

The results of the online survey demonstrated a positive perception of the legal marijuana market in these states by participants. Additionally, researchers found “respondents, including frequent cannabis consumers, perceived legal cannabis to be of equal or greater quality and convenience, and as safer to buy and use than cannabis from illegal sources. The one notable exception was price: legal cannabis products were perceived as more expensive than illegal products, particularly among frequent cannabis users. The prevalence of this belief suggests that price may in fact be a barrier to transitioning to the legal market; however, it is also possible that higher prices may be tolerated given that legal cannabis products may be perceived as higher quality, safer and more convenient to access. However, frequent users may be able to obtain what they perceive as high-quality products at lower prices through established relationships with unauthorized dealers. Price perceptions were generally more favorable in states with a longer time with retail sales: Colorado, Washington, and Oregon” (Fataar et al, 2021).

Source: Fataar, F., Goodman, S., Wadsworth, E., and Hammond, D. (2021). *Consumer perceptions of “legal” and “illegal” cannabis in US states with legal cannabis sales.* Addictive Behaviors, 112, 106563-106569

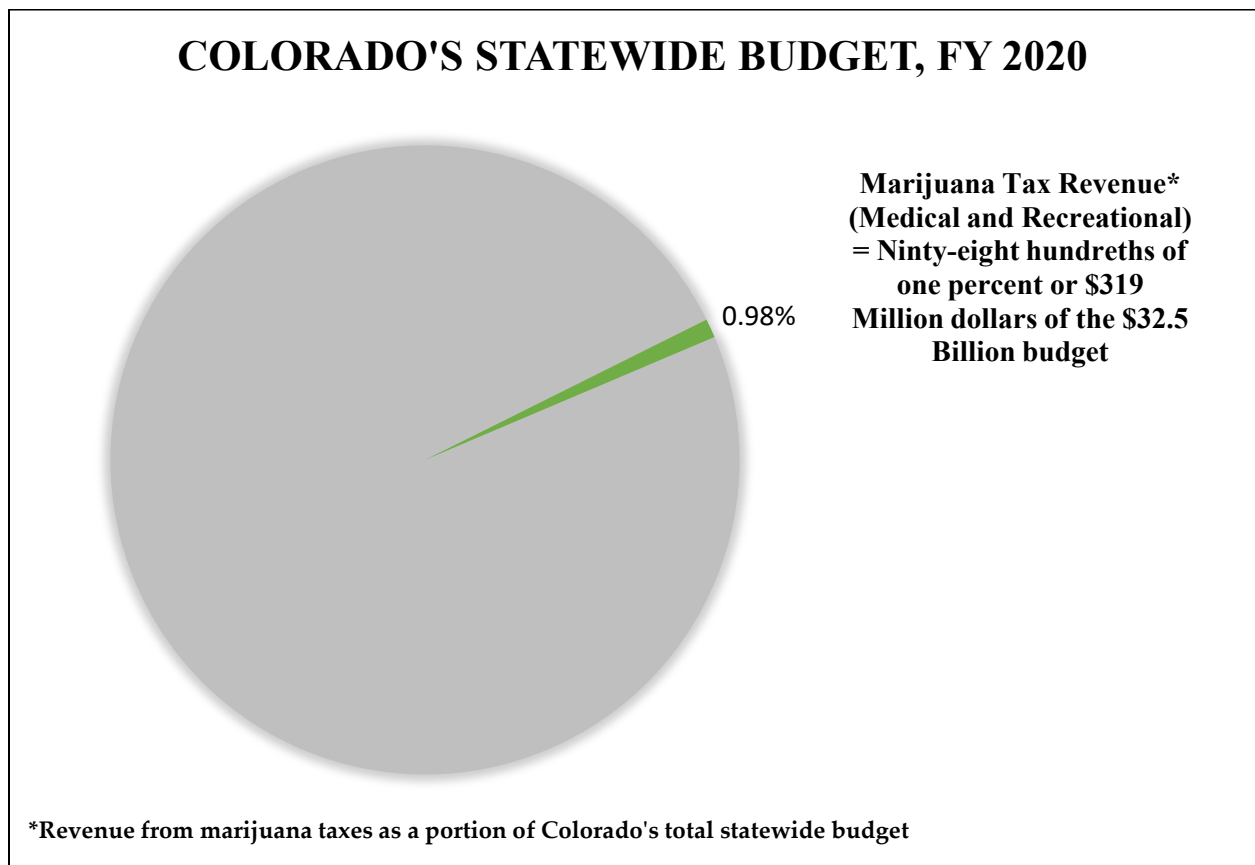
Section V: Societal Impact

Some Findings

- Marijuana tax revenue represent approximately **0.98%** of Colorado’s FY 2020 budget.
- **66%** of local jurisdictions in Colorado have banned medical and recreational marijuana businesses.

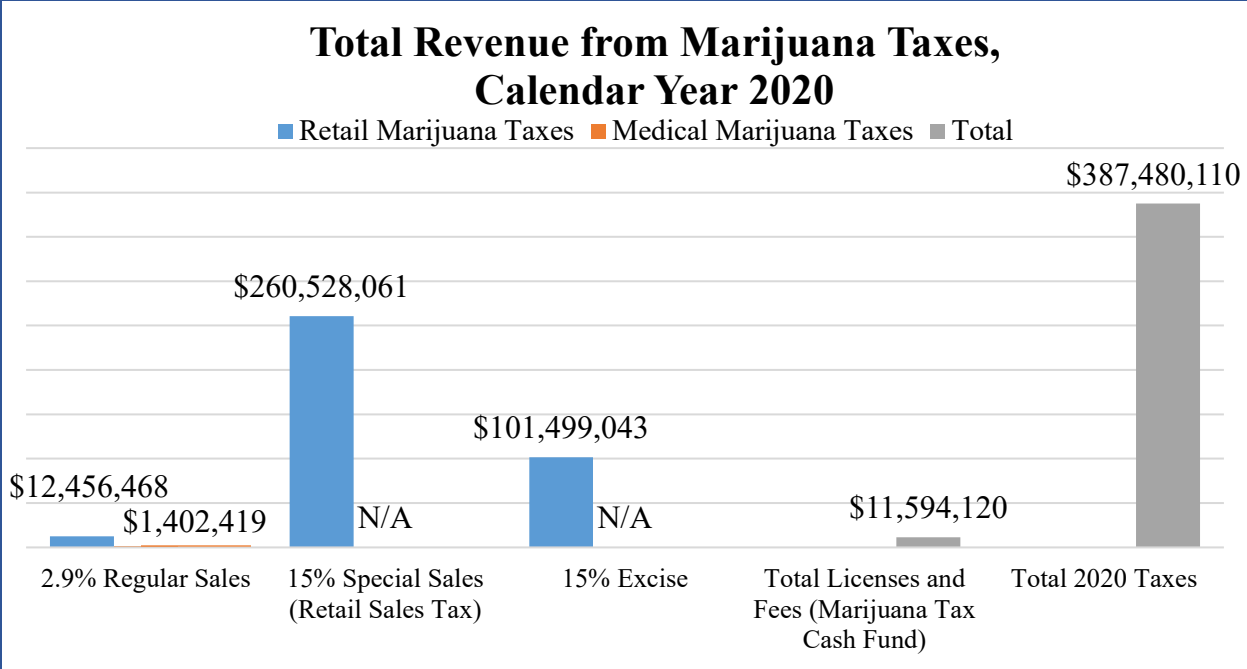
For more detailed marijuana-related crime information, please visit https://cdpsdocs.state.co.us/ors/docs/reports/2021-SB13-283_Rpt.pdf.

Tax Revenue



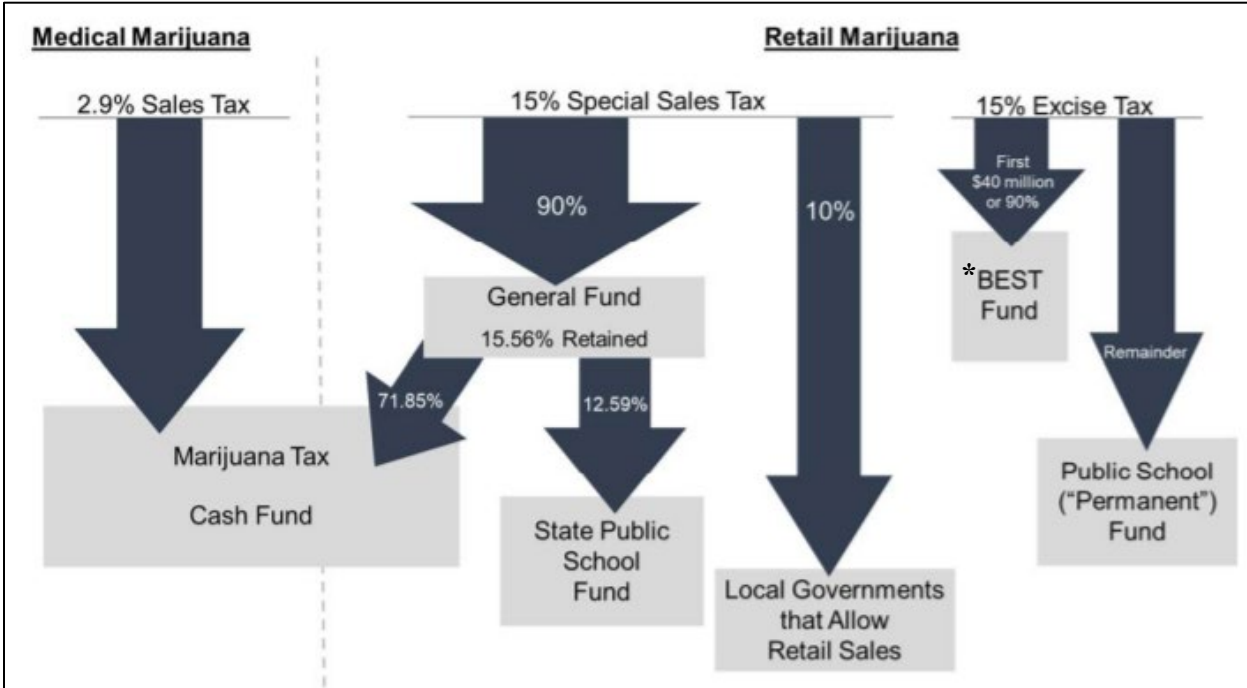
SOURCE: Governor’s Office of State Planning and Budgeting

***NOTE:** Revenue from marijuana taxes as a portion of Colorado's total statewide budget.



SOURCE: Colorado Department of Revenue

NOTE: Figures do not include any city taxes; the state does not assess or collect those taxes. Per §39-26-729, C.R.S., retail marijuana, retail marijuana products, and retail marijuana concentrates are exempt from the 2.9% regular sales tax; however, products that do not contain marijuana (i.e., accessories) are still subject to the 2.9% regular sales tax. Licenses and fees include the following categories: retail marijuana, individual, others, and collections not yet allocated.



SOURCE: Joint Budget Committee Appropriations Report Fiscal Year 2019-2020

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Crime

Marijuana-Related Arrests in Colorado			
	Crimes Against Person	Crimes Against Property	Crimes Against Society
2009	187	426	10,388
2010	172	416	10,026
2011	167	450	10,576
2012	192	441	11,365
2013	45	216	5,358
2014	60	273	5,689
2015	55	253	5,560
2016	69	327	5,126
2017	83	297	4,983
2018	74	310	4,641
2019	70	268	3,704
2020	65	188	2,140

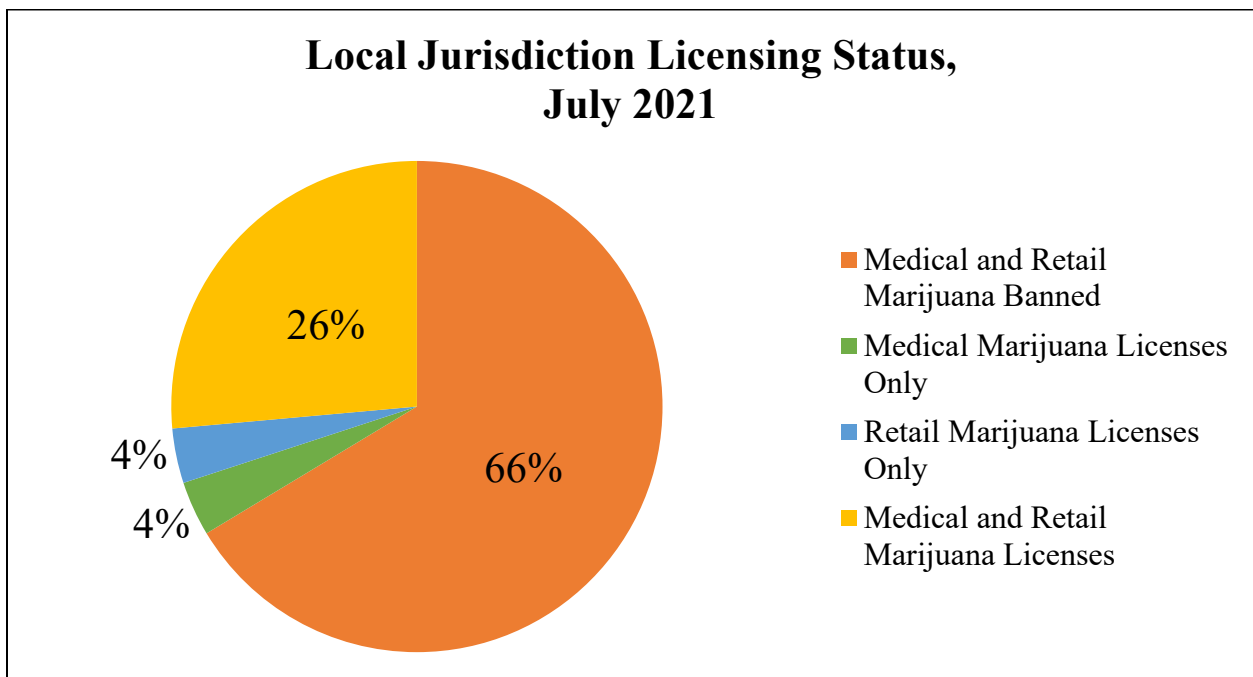
SOURCE: Colorado Bureau of Investigations Crime Statistics

NOTE: In 2020, arrest numbers were impacted by the COVID-19 pandemic's impact of the local, state, and federal judicial systems.

Local Response

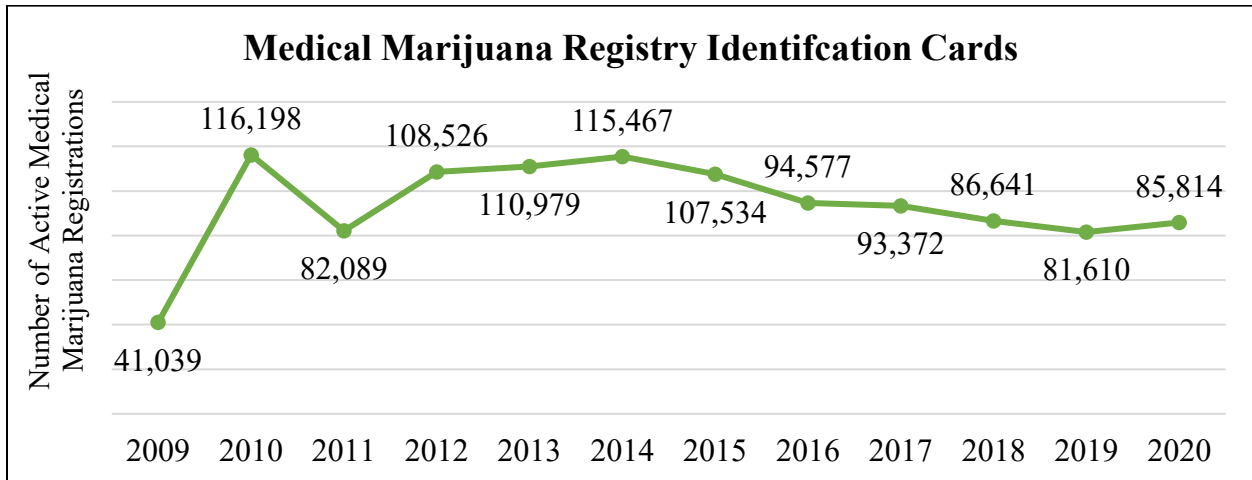
Status of Local Jurisdictions Reporting Marijuana Licensing as of July 12, 2021	
	Number of Jurisdictions
Medical and Retail Marijuana Banned	221
Medical Marijuana Licenses Only	12
Retail Marijuana Licenses Only	12
Medical and Retail Marijuana Licenses	88
Total	333

SOURCE: Colorado Marijuana Enforcement Division



SOURCE: Colorado Marijuana Enforcement Division

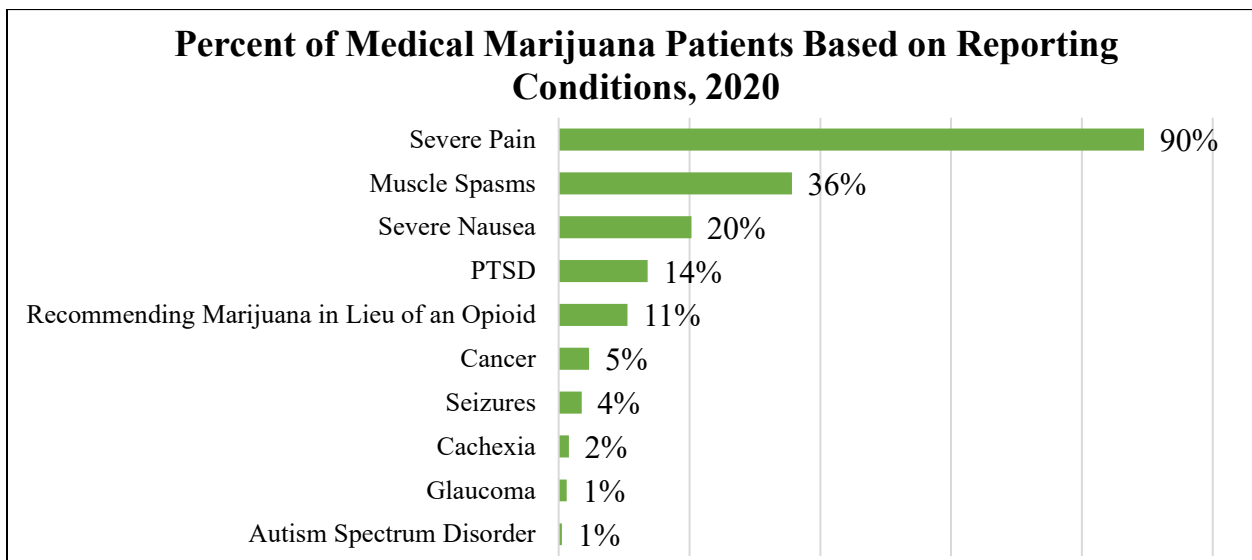
Medical Marijuana Statistics



SOURCE: Colorado Department of Public Health and Environment (CDPHE)

Profile of Colorado Medical Marijuana Cardholders:

- Demographics of cardholder:
 - 61% male with an average age of 41 years
 - 39% female with an average age of 44 years
 - 0.32% between the ages of 0 and 17
 - 4.57% between the ages of 18 and 40 and 22.81% between the ages of 21 and 30
- Top five counties in Colorado- 63.1% of total patients:
 - El Paso County- 28.6%
 - Denver County 13.0%
 - Jefferson County- 9.5%
 - Arapahoe County-7.7%
 - Adams County- 6.3%

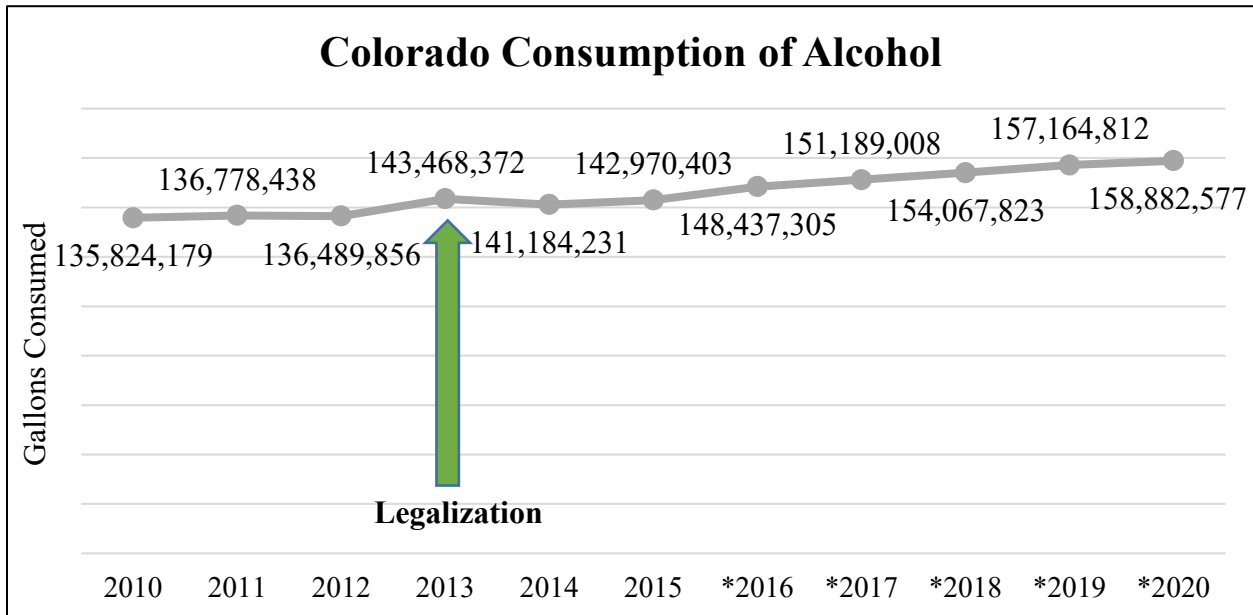


SOURCE: Colorado Department of Public Health and Environment (CDPHE)

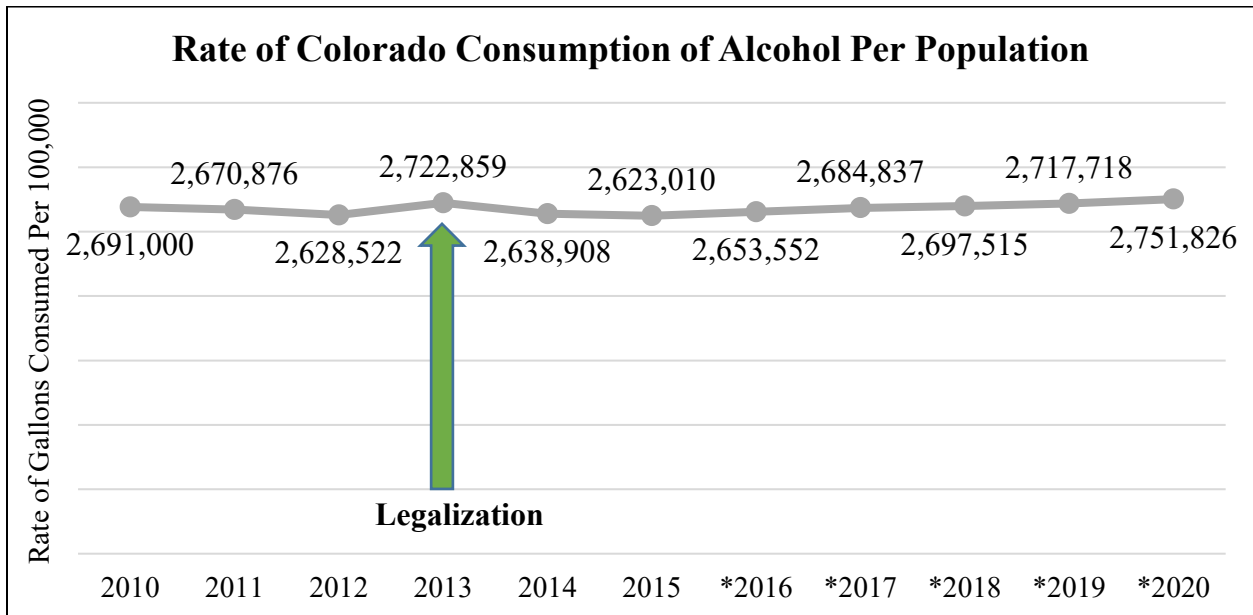
NOTE: Percentages do not add to 100% as some patients report more than one debilitating or disabling medical condition.

Alcohol Consumption

- It has been suggested that legalizing marijuana would reduce alcohol consumption. Thus far that theory is not supported by the data.



SOURCE: Colorado Department of Revenue, Colorado Liquor Excise Tax



SOURCE: Colorado Department of Revenue, Colorado Liquor Excise Tax

***NOTE:** Data from 2009 was not available at this time. Calculations of total gallons consumed and the rate of consumption slightly differed from 2010-2015 compared to 2016-2020.

Societal Impact Information

Recreational Marijuana Dispensaries Impact on Property Values in Washington

A study in Washington was completed to assess the impact of marijuana legalization on property values throughout the state. The authors sought to better understand the local level impacts of the expansion of marijuana businesses in neighborhoods throughout Washington. This study utilized data from property sales and retailers statewide to compare the prices in neighborhoods before and after the opening of a recreational marijuana business. One factor that the authors hypothesize may be the source of the decrease in prices is the perception that dispensaries result in more crime in the area. However, existing evidence is unclear of this relationship.

The study resulted in an estimation that while there was not a statistically significant impact on overall crime reports, nuisance crimes around dispensaries increased but drug-related crimes decreased. “Increased nuisance related crime, therefore, may be one contributing factor to depressed home prices in areas near dispensaries” (Thomas and Tian, 2021). When examining the final results, “a marijuana dispensary decreases property values by 3%–4% for homes within 0.36 miles of the retailer, a decline of about \$10,000-\$15,000 based on the average home values in Washington. These results imply a high willingness to pay to avoid the local negative externalities. [...] While we find limited evidence of a general decrease in overall crime and statistically significant evidence of a decrease in drug-related reports, we estimate that nuisance-related crime reports increase by about 4.2 per 10,000 census tract residents. Moreover, we find evidence that violent crime slightly increases in census tracts adjoining those where dispensaries locate. Our findings suggest that crime risk could be a contributing factor to the negative price impacts of dispensaries, but that is likely only a partial explanation” (Thomas and Tian, 2021).

Source: Thomas, D. and Tian, L. (2021). *Hits from the bong: The impact of recreational marijuana dispensaries on property values*. *Regional Science and Urban Economics*, 87, 103655-103675.

Crime in Colorado and Washington State Post-Legalization

While some believed that crimes, particularly marijuana-related crimes, would decrease after the legalization of recreational marijuana, the preliminary data suggested a significant increase in crime rates. The authors created a study examining the UCR data from 1999 to 2016 in Colorado and Washington at a monthly crime rate compared to control states in which recreational marijuana was not legal. In the results, there was little effect on overall crime rates in Colorado and Washington post-legalization, particularly on violent crimes. However, there was a statistically significant increase in larceny in Colorado immediately after legalization as well as an increase in aggravated assaults, burglary, and overall property crime in Washington. This trend dissipated in recent years and appeared to have been short-lived. Overall, the authors concluded there was “virtually no statistically significant long-term effects of recreational marijuana legalization or retail sales on violent or property crime rates, except for a significant decline of burglary rates in Washington. There were some immediate increases in crime at the point of legalization, but these did not result in long-term effects” (Lu et al, 2021).

Source: Lu, R., Willits, D., Stohr, M., Makin, D., Snyder, J., Lovrich, N., Meize, M., Stanton, D., Wu, G., and Hemmens, C. (2021) *The cannabis effect on crime: time-series analysis of crime in Colorado and Washington state*. *Justice Quarterly*, 38(4), 565-595.

Impact of Marijuana Legalization on Colorado Clearance Rates

One of the arguments in favor of the legalization of marijuana was police resources would be freed up with less marijuana-related crimes. On the other side of the argument, some believed areas around dispensaries would become a hub for crime, both violent and property, due to the large amount of cash associated with these locations. This study examined violent and property crimes from 2000 to 2017 in Colorado and Washington and compared the crime rates to states where marijuana was not legalized. The results indicated that violent crime clearance rates were not affected by the legalization of marijuana in Colorado. Property crime clearance rates were also not impacted in the long-term in Colorado but instead only for one year after legalization. Similar results were found in Washington when these crimes examined in these two categories compared year-to-year. The authors speculate if the legalization of marijuana has shifted the focus from law enforcement to investigating marijuana-related DUI cases for example rather than clearing crimes.

Source: Jorgensen, C. and Harper, A. (2020). *Examining the effects of legalizing marijuana in Colorado and Washington on clearance rates: a quasi-experimental design*. *Journal of Experimental Criminology*, 1-22.