

THE SCIENCE OF TODAY'S HIGH POTENCY THC

**Colorado's Dangerous Regulatory Gaps**

LIBBY STUYT, MD  
January 2021

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THE ISSUES

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COMMERCIALIZATION HAS RADICALLY CHANGED MARIJUANA

THEN	NOW
<p>Before 2000, THC Potency in Marijuana was 4-5%</p>	<p>Today, THC potency in products like shatter can exceed 90%. They are smoked in a rig using a butane torch.</p>

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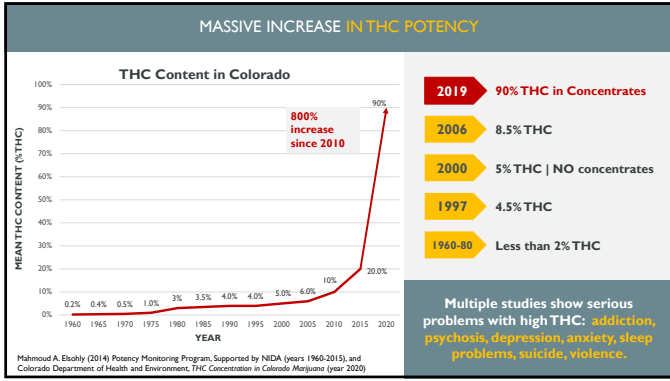
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### HIGHER DRUG POTENCY = MORE POTENTIAL FOR ADDICTION

High-potency THC use is associated with an **increased severity of dependence, especially in young people.**

High potency = 15% THC or higher  
Low potency = 5% THC or lower

NICOTINE	3mg	vs.	20mg	→
ALCOHOL	beer	vs.	vodka	→
COCAINE	coca leaf	vs.	cocaine	→
OPIOIDS	codeine	vs.	Oxycontin	→
CANNABIS	THC <2%	vs.	THC 17-90%	→

Freeman TP and Winstock AR. Examining the profile of high-potency cannabis and its association with severity of cannabis dependence. Psych Med 2015;45:3181-3189

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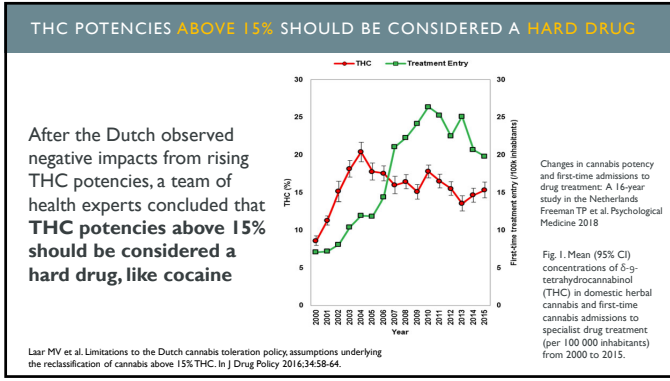
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**MOST PRODUCTS AVAILABLE IN COLORADO MEDICAL AND RECREATIONAL DISPENSARIES CONTAIN GREATER THAN 15% THC**

**CO MEDICAL**

Total = 545

**CO RECREATIONAL**

Total = 707

**Legend:**

- >15% THC
- 10-15% THC
- 5-10% THC
- 5% THC

Cash MC, Cunnane K, Fan C, Romero-Sandoval EA. Mapping cannabis potency in medical and recreational programs in the United States. PLOS ONE 2020

**ABSOLUTELY NO RESEARCH** supports high-potency THC concentrates like dab, shatter, wax, or hash oil as safe or effective to treat any medically diagnosed condition

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**CONCENTRATES ARE NOT ALL NATURAL**

In 2019, Colorado high potency THC concentrates averaged **69.4% THC**

STATE LAWS AND REGULATIONS HAVE NOT KEPT UP WITH THE EVOLUTION OF HIGH POTENCY MARIJUANA CONCENTRATES

SOME CONCENTRATES ARE MADE WITH MATERIALS LIKE BUTANE AND PROPANE THAT ARE CARCINOGENIC

2019 Regulated Marijuana Market Update, Colorado Department of Revenue, Marijuana Enforcement Division  
2020 Extraction Magazine article: <https://extractionmagazine.com/category/new/cannabis-concentrates-figure-2020/>

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Perfect Example of State Laws and Regulations not keeping up with the evolution of high potency products

**Available in both medical and recreational dispensaries**

IN THE INDUSTRY'S OWN WORDS  
Disclaimer on package

**"There may be long term physical or mental health risks from use of marijuana including additional risks for women who are or may become pregnant or are breastfeeding. Use of marijuana may impair your ability to drive a car or operate machinery. This product was produced without regulatory oversight for health, safety or efficacy. This product complies with testing requirements. This packaging is child resistant. This product is intended to be inhaled."**

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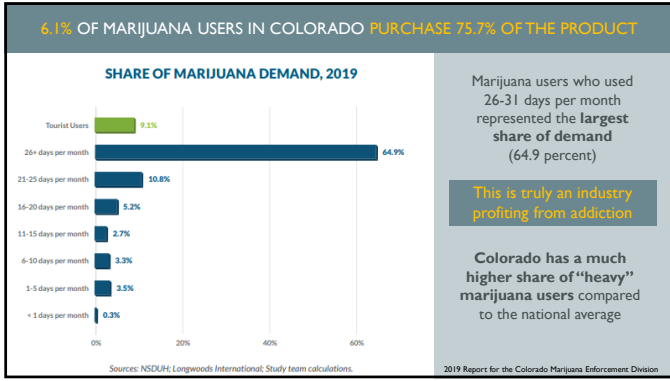
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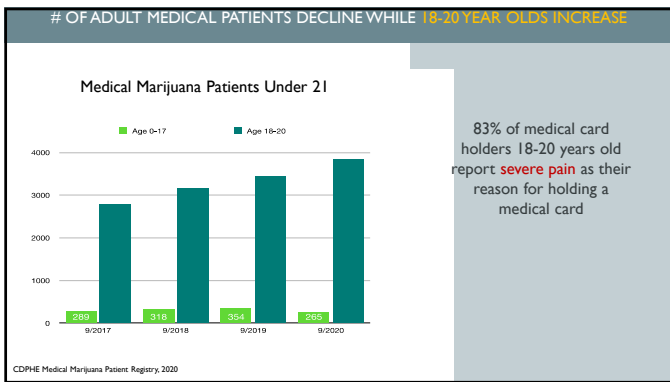
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**COLORADO YOUNG ADULTS 18-25 YEAR OLDS ARE AT HIGHEST RISK**

- Highest marijuana-consuming population in the state
- Almost double national rate for daily marijuana use (among young adults who were in middle and high school when legalization occurred)
- Most likely to be unsafe while high
- 1 in 3 are consuming marijuana
- 1 in 7 are consuming marijuana DAILY
- 1 in 20 are driving after using

Behavioral Risk Factor Surveillance System (BRFSS) data, 2019  
Colorado Department of Health and Environment

In the medical market:

- twice as much can be bought daily – 2 ounces versus 1 ounce in recreational
- taxes significantly lower
- no marijuana recommendation specifications or monitoring or control for "looping"

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RESEARCH SUPPORTING THE USE OF SMOKED CANNABIS FOR MEDICAL CONDITIONS IS LIMITED TO LESS THAN 10% THC

- All studies of smoked medicinal cannabis showing benefit – done with less than 10% THC  
Whiting PF, Wolff RF, Deshpande S et al. Cannabinoids for medical use: a systematic review and meta-analysis. JAMA 2015;313:2456-2473
- No valid science exists to validate medicinal cannabis greater than 10% THC
- A study in healthy volunteers on cannabis effects in capsaicin-induced pain found a window of modest analgesia for smoked cannabis. Wallace M et al. Anesthesiology 2007;107:785-796
  - 2% THC provided no benefit
  - 4% THC provided significant pain decrease
  - 8% THC caused increased pain or hyperalgesia

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KIDS BELIEVE HIGH POTENCY PRODUCTS ARE SAFE BECAUSE THEY ARE AGGRESSIVELY MARKETED AND SOLD AS MEDICINE

Colorado young people have significantly increased their use of dabbing and edibles since 2015.

JAMA Pediatrics 2019;173:988-989  
Colorado Healthy Kids Survey, 2019

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HIGH-POTENCY THC CAN BE DECEPTIVELY APPEALING TO KIDS

**Dangerous Regulatory Gaps:**

- No limits on THC potency or standardized serving size (except for recreational edibles)
- No meaningful limits on products that appeal to kids
- Ongoing loopholes for ages 18-20 in medical market
- Gaps in data collection regarding impacts of today's high-potency THC
- Gaps in restrictions on marketing and advertising that influences kids
- Dramatic budget cuts for education and prevention should make addressing regulatory gaps an urgent state priority

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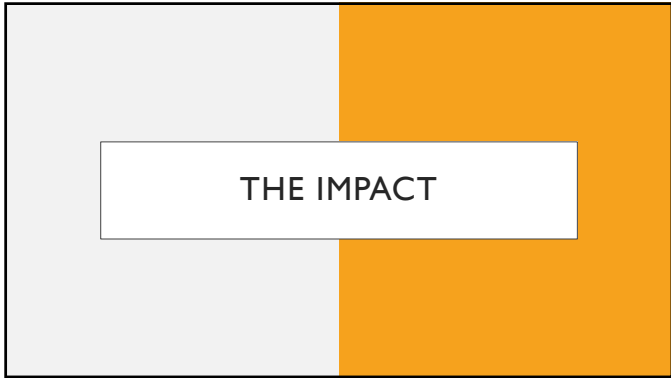
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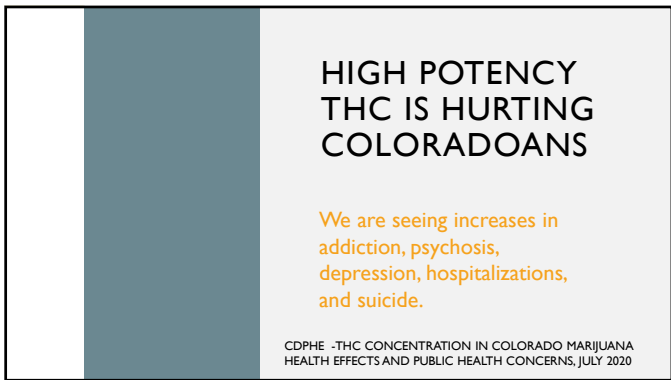
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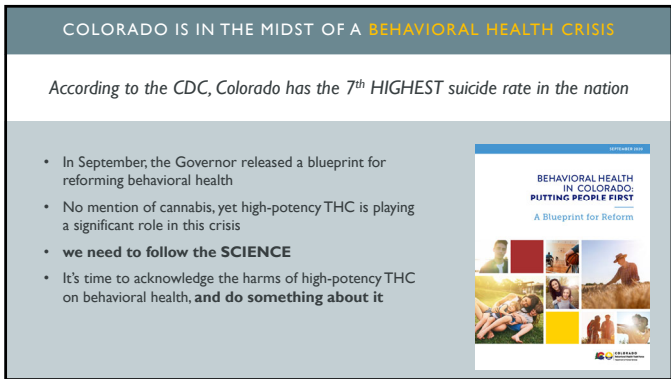
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HIGH-POTENCY THC LINKED WITH A **TRIPLED RISK** FOR **PSYCHOSIS**

The study analyzed 780 people ages 18-65, 410 with first-episode psychosis and 370 healthy controls

**HIGH-POTENCY THC (15% THC or more) 3X INCREASED RISK OF PSYCHOSIS**

**DAILY USE (15% THC or more) 5X INCREASED RISK OF PSYCHOSIS**

LOW POTENCY (less than 5% THC) HAD NO ASSOCIATED RISK FOR PSYCHOSIS

DiForti et al. Lancet Psychiatry, 2015

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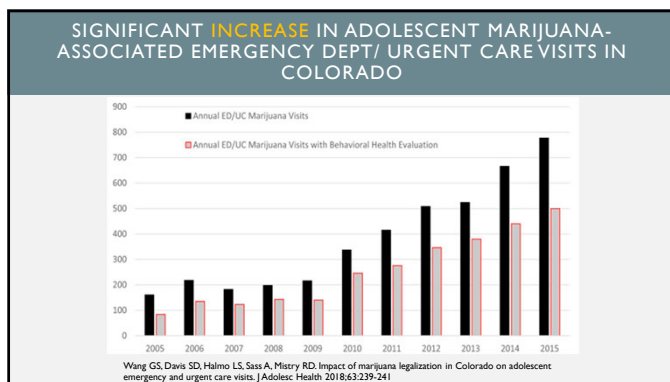
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MARIJUANA IS **NOT** THE ANSWER FOR **PTSD**

- A growing number of states have identified PTSD as an approved condition for medical marijuana despite any good evidence that it is safe and effective
- Observational study of 2276 Veterans treated in VA PTSD treatment programs
  - Never used marijuana – significantly lower symptom severity 4 months later
  - “Starters” – highest levels of violent behavior and PTSD symptoms 4 months after treatment
  - “Stoppers” – lowest level of PTSD symptoms at 4 months after treatment
- Wilkinson et al. J Clin Psychology 2015

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### WHY MARIJUANA (THC) IS NOT THE ANSWER FOR PTSD

- Similar as to why benzodiazepines are not the answer
- Temporary relief – numbing, disconnecting from the traumatic emotions – so it seems to work
- But it requires continual use, daily, which can lead to:
- Cognitive impairment, a-motivational syndrome, potential for psychosis or worsening psychosis from PTSD
- Addiction potential and vicious cycle
- Increased suicidal ideation and attempts with CUD
- False memories

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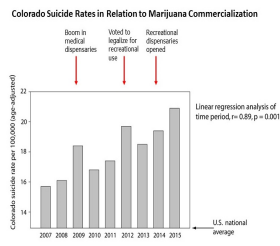
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### CORRELATION OF MARIJUANA AND SUICIDE



In fact, veteran suicides have not decreased. Instead, they are up 32% since 2001, compared to a national increase of 23% during the same period – Congressional Hearing [4/27/17](#)

**2020** National Veteran Suicide Prevention Report from the Department of Veterans Affairs – Colorado's rate significantly higher than national rate. 217 Veteran suicide deaths in Colorado last year – all time high and 25% increase over 2018

Christine Miller, PhD

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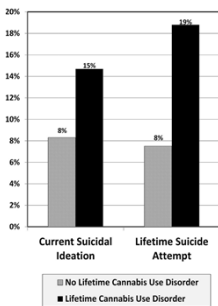
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### CANNABIS USE DISORDER IS ASSOCIATED WITH SUICIDE ATTEMPTS AMONG VETERANS



- 3,233 veterans in cross-sectional, multi-site study by Veterans Affairs (VA).
- Cannabis use disorder was significantly associated with both current suicidal ideation and lifetime history of suicide attempts compared to veterans with no lifetime history of cannabis use disorder.
- The significant difference persisted even after adjusting for sex, PTSD, depression, alcohol use disorder, non-cannabis drug use disorder, history of childhood sexual abuse and combat exposure.

Kimbril NA et al. J Psychiatric Research 2017;89:1-5

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### MARIJUANA AND TEEN SUICIDE

- Large longitudinal study in Australia and New Zealand of over 2000 adolescents and maximum frequency of marijuana use found almost **7X increase in suicide attempts in daily marijuana users compared with non-users**
- Silins E et al. The Lancet psychiatry Vol 1 September 2014

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### SUICIDE AND ADOLESCENT CANNABIS USE

- Systematic review and meta-analysis
  - Eleven studies, N=**23,317 adolescents**
  - Risk of depression OR = 1.4
  - Suicidal Ideation OR = 1.5
  - **Suicide attempt OR = 3.5**
  - **Significantly higher in adolescent cannabis users than in non-users**
- Gobbi G et al. Associations of cannabis use in adolescence and risk of depression, anxiety, and suicidality in young adulthood: a systematic review and meta-analysis. JAMA Psychiatry. 2019;76:426-434.

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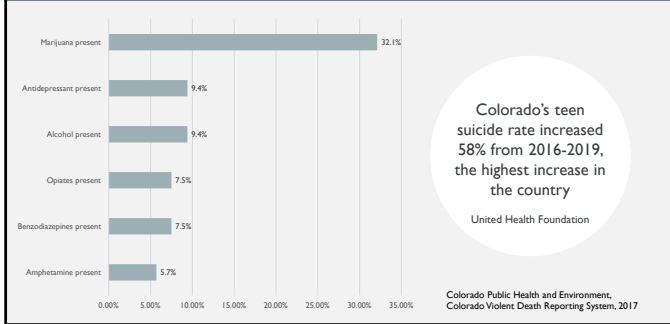
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### THC IS THE NUMBER ONE DRUG FOUND IN 75 TEENS, AGE 15-19, WHO DIED BY SUICIDE IN COLORADO IN 2017



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### CANNABINOID HYPEREMESIS SYNDROME

- Once extremely rare, but now flooding Emergency Rooms in Colorado
- Uncontrolled cyclic vomiting that often requires emergency treatment to stop vomiting and rehydrate
- Severe abdominal pain
- Medications don't control the symptoms
- Causing people to receive full medical work-ups costing hundreds of thousands of dollars
- Higher THC potency is causing people to be addicted and use more often, increasing risk of CHS
- Only solution is quit using cannabis

#### CHS INCREASING EVERY YEAR

Year	Total Cases
2010	10
2011	15
2012	20
2013	25
2014	30
2015	35
2016	40
2017	45
2018	55
2019	105

Data collected by Brad Roberts, MD, ER physician in Parkview, Pueblo, CO

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### MARIJUANA HAS NOT DECREASED OPIOID OVERDOSE DEATHS IN COLORADO

Number of drug overdose deaths by substances mentioned: Colorado residents, 2000-2019

Year	Prescription opioids	Methamphetamine (and other psychostimulants)	Heroin	Cocaine	Fentanyl (and analogs)
2000	67	14	37	12	5
2019	483	347	226	211	134

Source: Vital Statistics Program, Colorado Department of Public Health and Environment

2019 data shows a **24% increase in prescription overdose deaths** and **115% increase in fentanyl deaths** since 2000

First use of marijuana before the age of 18 has the highest contribution to opiate use disorders (OUD)- a much higher contribution compared to early initiation of alcohol.

Wadeker AS. Understanding opiate use disorders (OUD) using a tree-based classifiers. Drug and Alcohol Dependence 2020

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### WE WANT TO AVOID THIS

The top executives of the seven largest American tobacco companies testified in Congress today that **THEY DID NOT BELIEVE THAT CIGARETTES WERE ADDICTIVE**, but that they would rather their own children did not smoke. APRIL 15, 1994

The New York Times  
NEW YORK, FRIDAY, APRIL 15, 1994  
Tobacco Chiefs Say Cigarettes Aren't Addictive

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