



# Marijuana Issues

Kevin A. Sabet, PhD

[www.learnaboutsam.org](http://www.learnaboutsam.org)

# What is SAM?



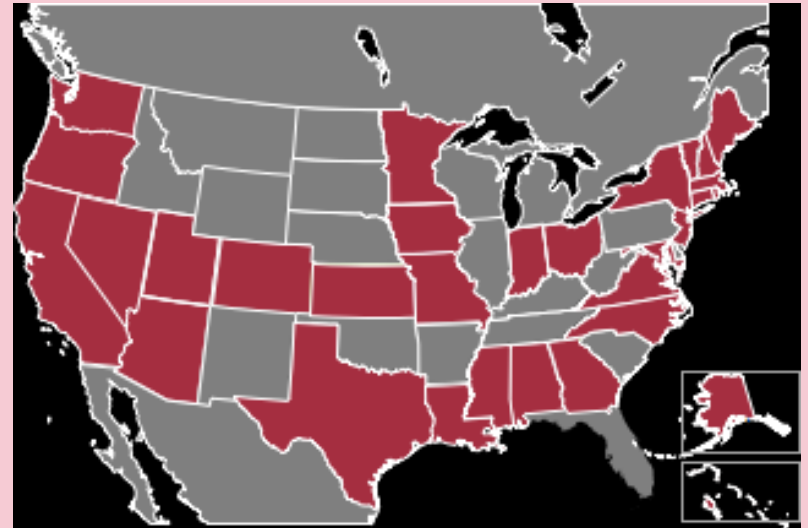
- A 501(c)(3) non-profit, educational organization funded by volunteers & private organizations
- Our mission:
  - **Educate citizens** on the science of marijuana
  - Promote **health-first, smart policies and attitudes** that decrease marijuana use and its consequences

# SAM promotes an evidence-based approach to marijuana policy that prioritizes public health

- **Non-partisan but high-profile:** founded by former Democratic Congressman Patrick Kennedy and leading Republican pundit David Frum
- **Scientific advisory board** of more than 12 leading researchers, professors, and public health/legal experts
- **Hundreds of thousands of press mentions**, including major media outlets such as:



## Several state and national affiliates



# Groups SAM has collaborated with

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- **American Society of Addiction Medicine**
- **American Academy of Pediatrics**
- **National Business Group on Health**
- **American Academy of Child and Adolescent Psychiatry**
- **Other leading public health authorities**
- **Over 30 state affiliates, including:**
  - Treatment centers
  - Recovery groups
  - Prevention organizations
  - Law enforcement
  - Leading medical authorities
  - Volunteer citizens
  - Business groups

# We are living in 1918...



**20,679 Physicians**  
*say LUCKIES are*  
*less irritating*

**I too prefer LUCKIES**  
*because...*

Toasting removes dangerous irritants that cause throat irritation and coughing

**LUCKY STRIKE**  
*"IT'S TOASTED"*  
CIGARETTES

**"It's toasted"**

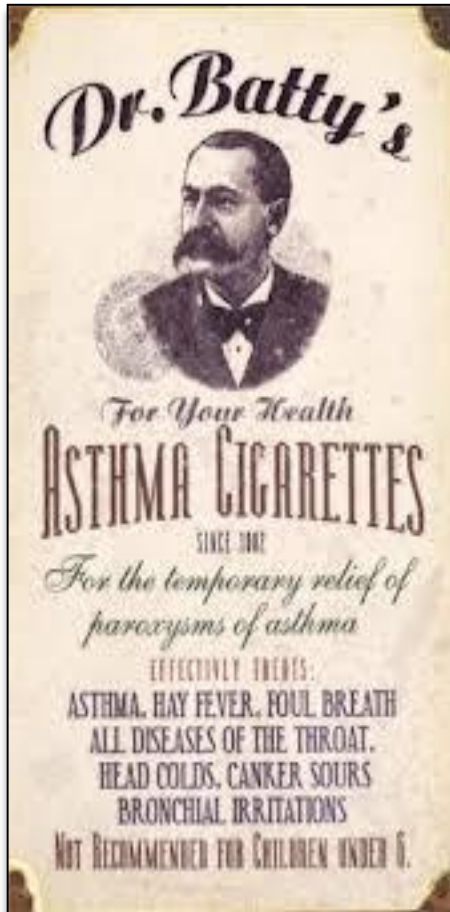
Your Throat Protection—  
against irritation—against cough.

© 1918 The American Tobacco Co., Inc.

© 1918 The American Tobacco Co., Inc.



# Repeating History?



*According to repeated nationwide surveys,*

## More Doctors Smoke **CAMELS** than any other cigarette!

*Doctors in every branch of medicine were asked, "What cigarette do you smoke?" The brand named most was Camels!*

*You'll notice in this advertisement that we don't claim that Camels cure colds and gripes, give you good luck, and a better complexion and longer life. We're all reasonable and sensible. Camels are Camels. We know you know how well they smoke. You know they taste just what they are. You know they are really healthy. And so we have made a cigarette that fits!*

**THE DOCTORS' CHOICE IS AMERICA'S CHOICE!**

*For 30 days, test Camels in your "P Zone" (P for Throat, P for Taste).*

## Viceroy

**FILTER**  
**the Smoke!**

As your Dentist,  
 I would recommend  
**VICEROYS**

## NOW...Scientific Evidence on Effects of Smoking!

A scientific SURVEY is making regular bi-monthly measurements of a group of people. Two hundred members of this group have smoked Chesterfield for an average of more than 10 years.

After ten months, the medical specialists report that the Chesterfield smokers are in the same, almost identical, state of health as the non-smokers. And the members of the group have enjoyed Chesterfield.

**MUCH Milder**  
**CHESTERFIELD**  
**IS BEST FOR YOU**

*First and Only Premium Quality Cigarette in both Regular and King-Size*

# Three separate issues that often get conflated

1

Penalizing drug  
users/  
"decriminalization"



2

Medicinal use  
of compounds  
derived from  
marijuana



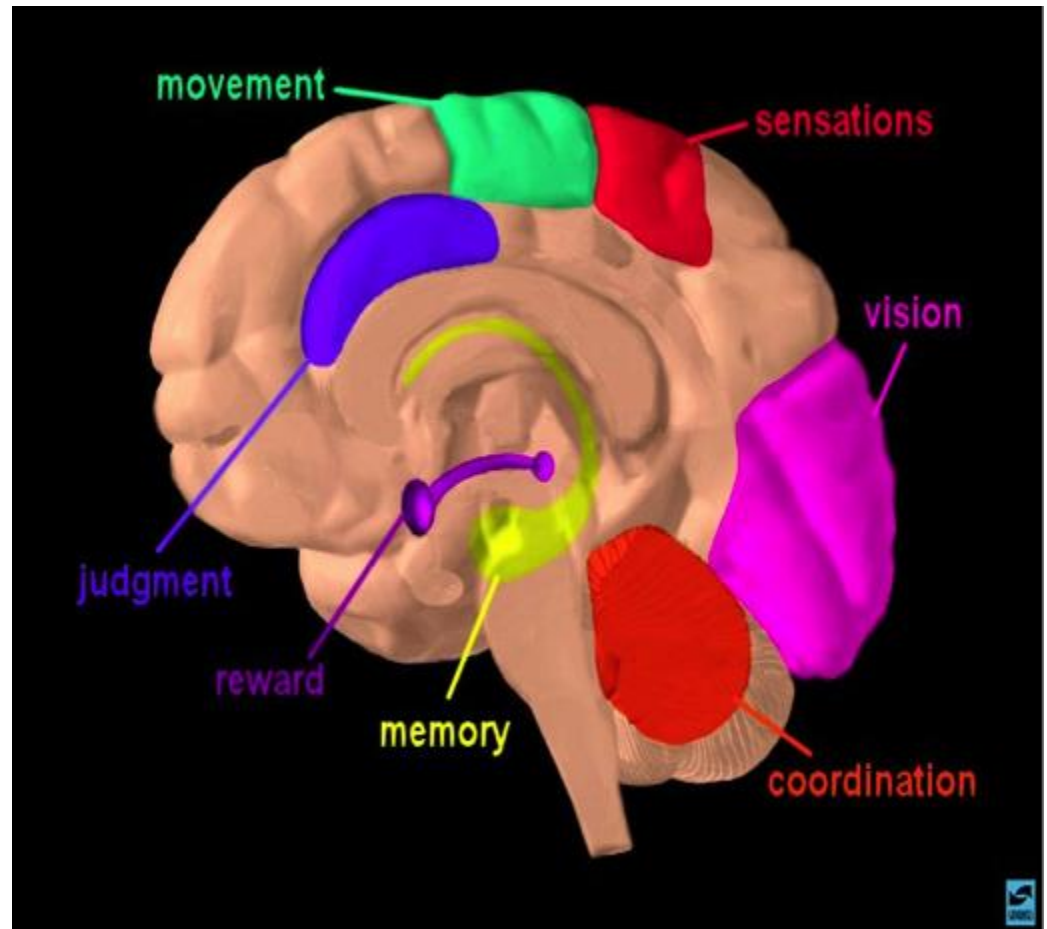
3

Legalization  
of marijuana  
for  
"non-medical"  
use



# Cannabinoid Receptors Are Located Throughout the Brain and Regulate a Host of Brain Activity

- Brain Development
- Memory & Cognition
- Motivational Systems & Reward
- Appetite
- Immunological Function
- Reproduction
- Movement Coordination
- Pain Regulation & Analgesia





# Not This...

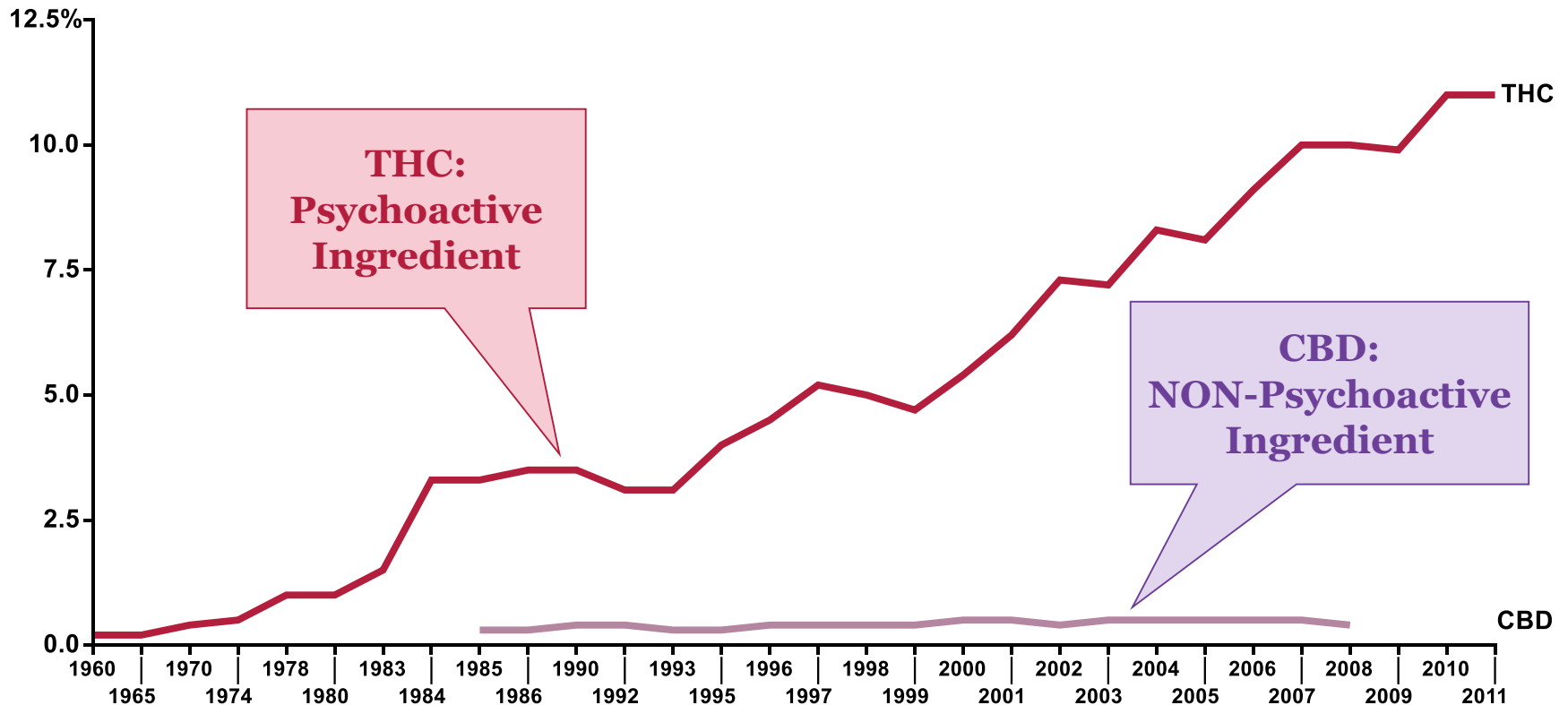


# ...But This



# Marijuana has become significantly more potent since the 1960s

Average THC and CBD levels  
in the United States



CBD										0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4		
THC	0.2	0.2	0.4	0.5	1.0	1.0	1.5	3.3	3.3	3.5	3.5	3.1	3.1	4.0	4.5	5.2	5.0	4.7	5.4	6.2	7.3	7.2	8.3	8.1	9.1	10.0	10.0	9.9	11.0	11.0

# Marijuana is not “just a plant” anymore – derivatives contain up to 98% THC



*“Green Crack”*  
wax



*“Ear Wax”*



Butane Hash Oil  
(BHO)



Hash Oil Capsules



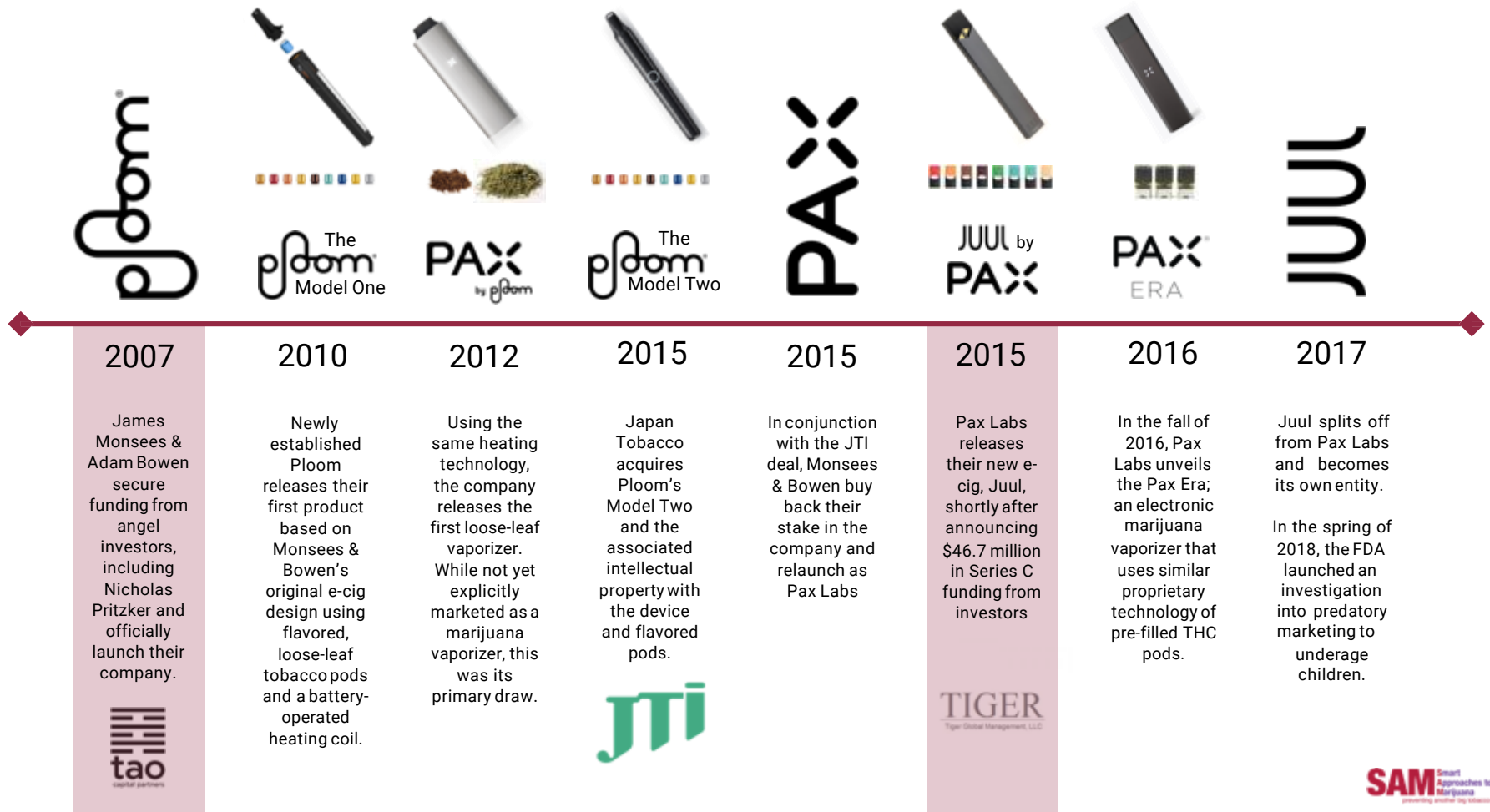
*“Budder”*

Copyright © 2014 by the SAMHSA Authors.  
All rights reserved.



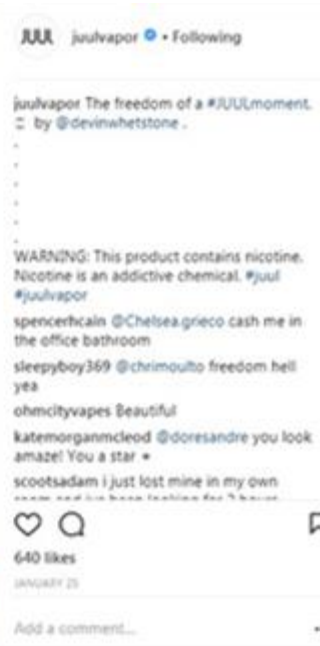
*“Shatter”*

# The Vape and Marijuana Industries Are Inextricably Linked



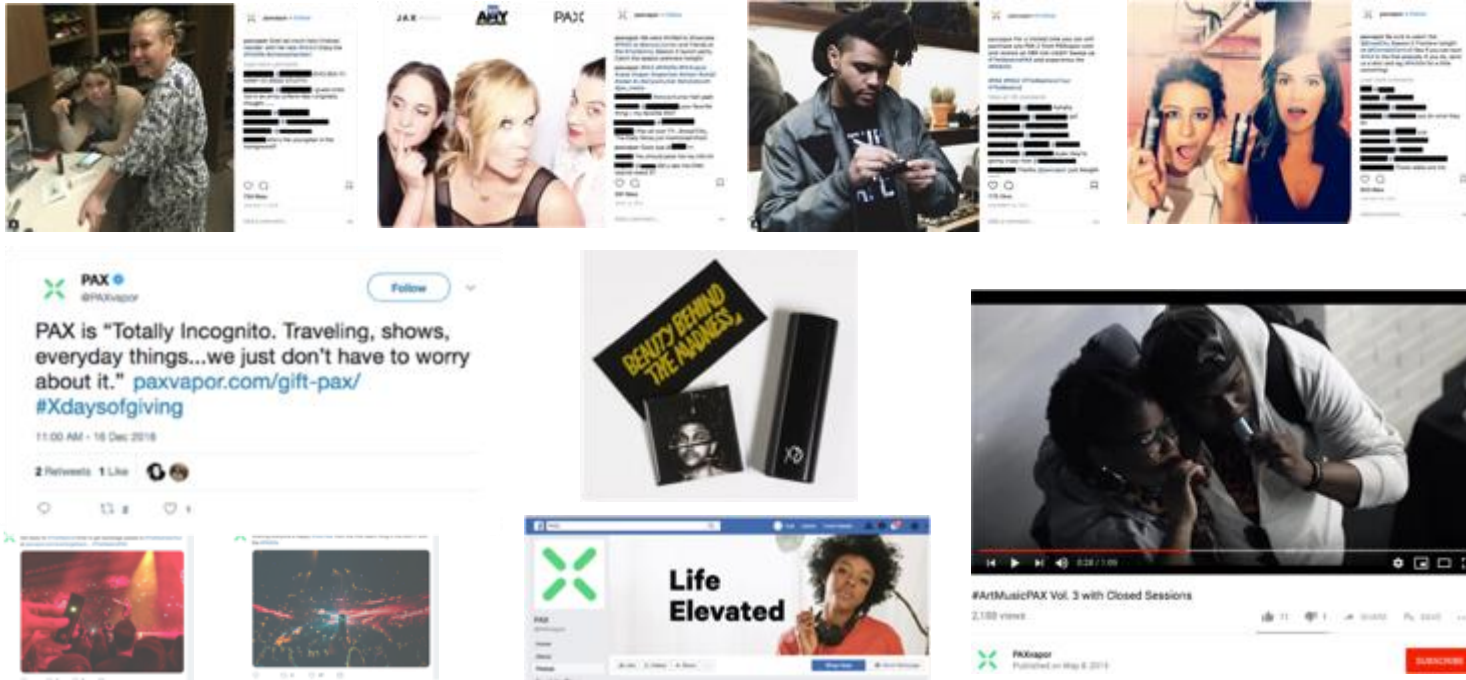


Silicon Valley start-up, Juul, used savvy social media marketing strategies to promote a trendy image associated with their products. They are currently under investigation by the FDA.





Similar branding, including celebrity endorsements, is used to promote their marijuana-vaporizing product - Pax.



# The pod technology used by Pax Labs provides a highly-addictive means of consumption



Juul pods contain **3x the legal limit** of nicotine in the EU and their sales are currently banned.



Some Pax Era pods can be as potent as 80% THC.  
**Amsterdam considered a proposal to classify THC potency higher than 15% as a hard drug**

# Product Innovation in Delivery Systems

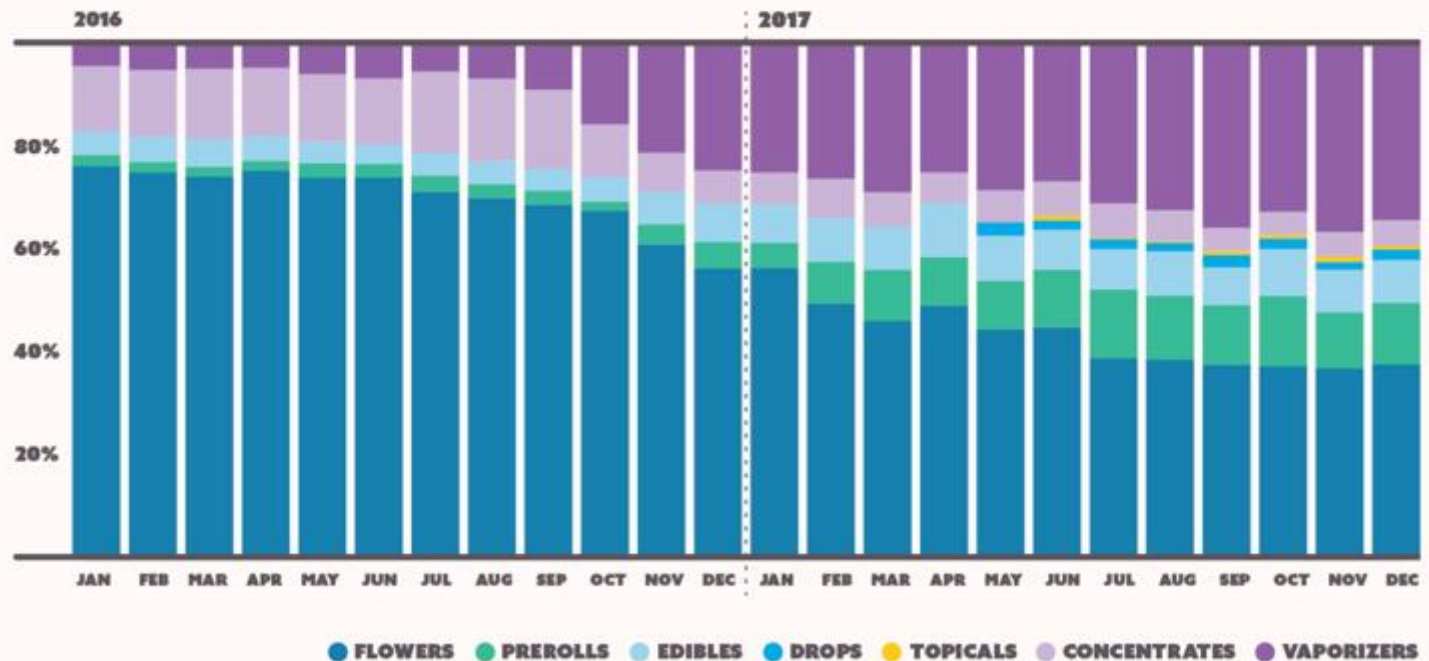
THC is not only smoked in joints, but now available in electronic form and in forms that look like needles. THC can be eaten, vaporized, and used in many ways – attracting new users who do not like to smoke.



# More people are using **non-smoked** marijuana

## Ready-To-Use Products Surpassed Flower For The First Time In History

Product Category Sales Trends



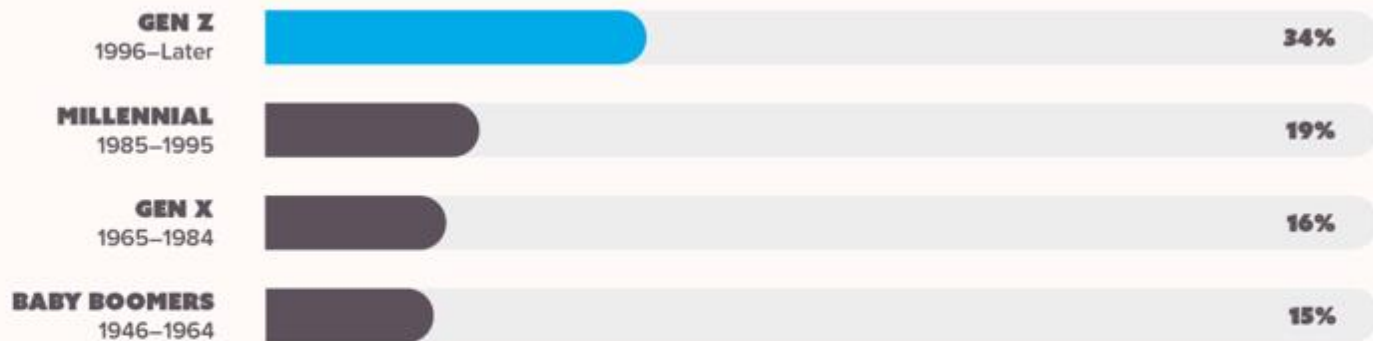
# Younger users are the highest users of concentrates – powerful and pure THC oil



## CONCENTRATES

Concentrates are highly potent extracts made from cannabis flower that come in many varieties. If flower is like wine, then concentrates would be the fine scotch—potent, with intense flavor and aroma. The highly refined nature of concentrates makes them a favorite among people who are looking for purity, maximum taste, and instant effect.

What percentage of customers ordered them in 2017?



COSMOPOLITAN

## There's a Weed-Infused Wine on the Market



**Only 35 calories per glass.**

**Each glass has only 5mg THC.**

Meaning you can enjoy it at a dinner party and still be able to talk to everyone



COSMO BITES

**This New Rosé Is Supposed To Be Hangover-Free — But It Will Get You High**

Marijuana-infused wine is now a thing. Officially.





U.S. News

INVESTING / STOCK MARKET NEWS

## Coming Soon From Molson Coors: Marijuana Beer

Molson Coors' new venture is targeting the Canadian cannabis market.

## Corona Owner's Marijuana Investment Reaps \$700 Million

By Uliana Pavlova  
June 29, 2018, 1:05 PM |  
**Bloomberg**



"I'm ready to introduce another high-impact brand to the industry again, this time with a new line of custom cannabis-infused craft beers."

-Creator of Blue Moon



*"Smoking is gross," a high schooler said. "Juuling is really what's up."*

NEW YORKER  
THE PROMISE OF VAPING AND THE RISE OF JUUL

*Teens have taken a technology that was supposed to help grownups stop smoking and invented a new kind of bad habit, molded in their own image.*



CIGALIKE



VAPE PEN



BOX MOD



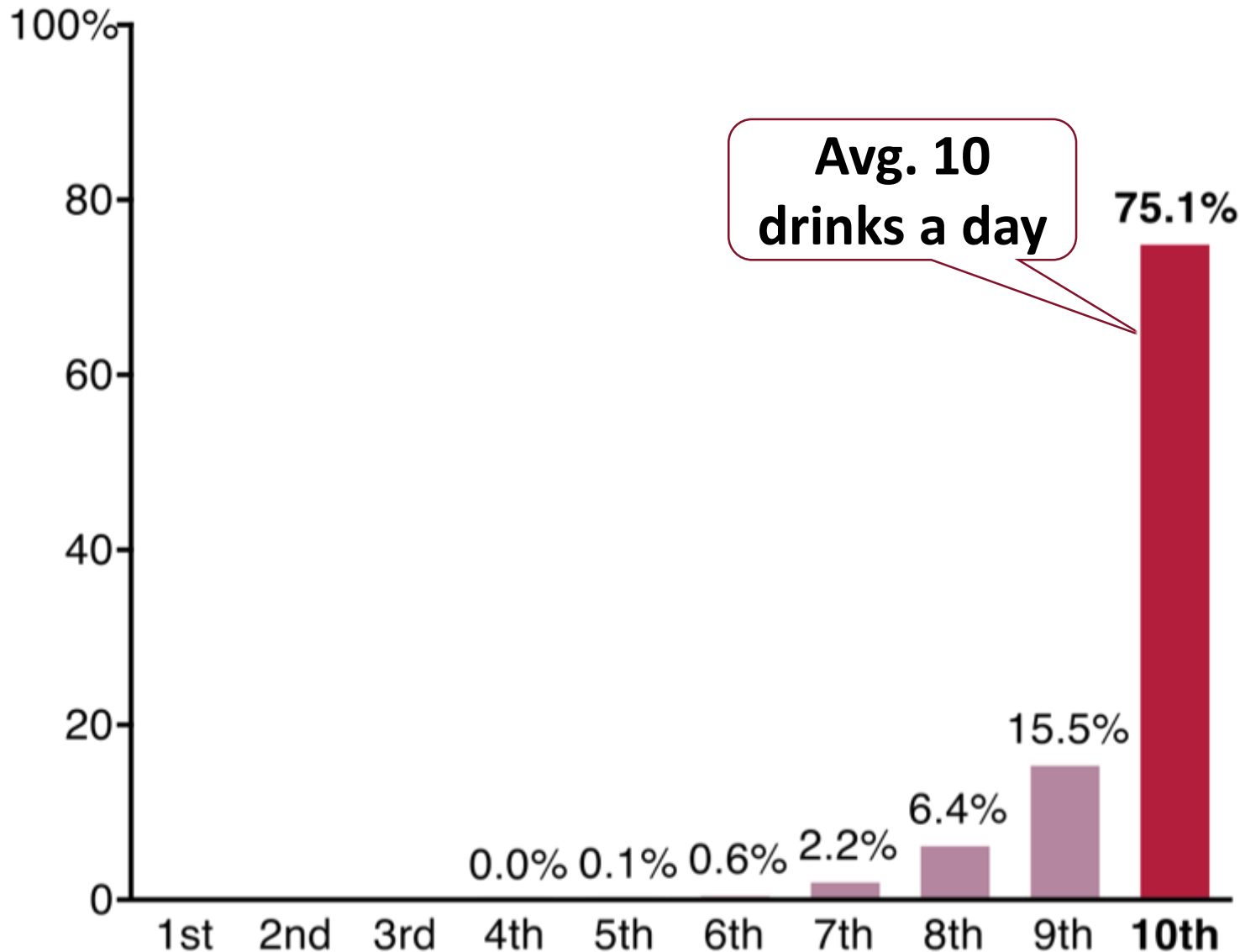
VAPE POD

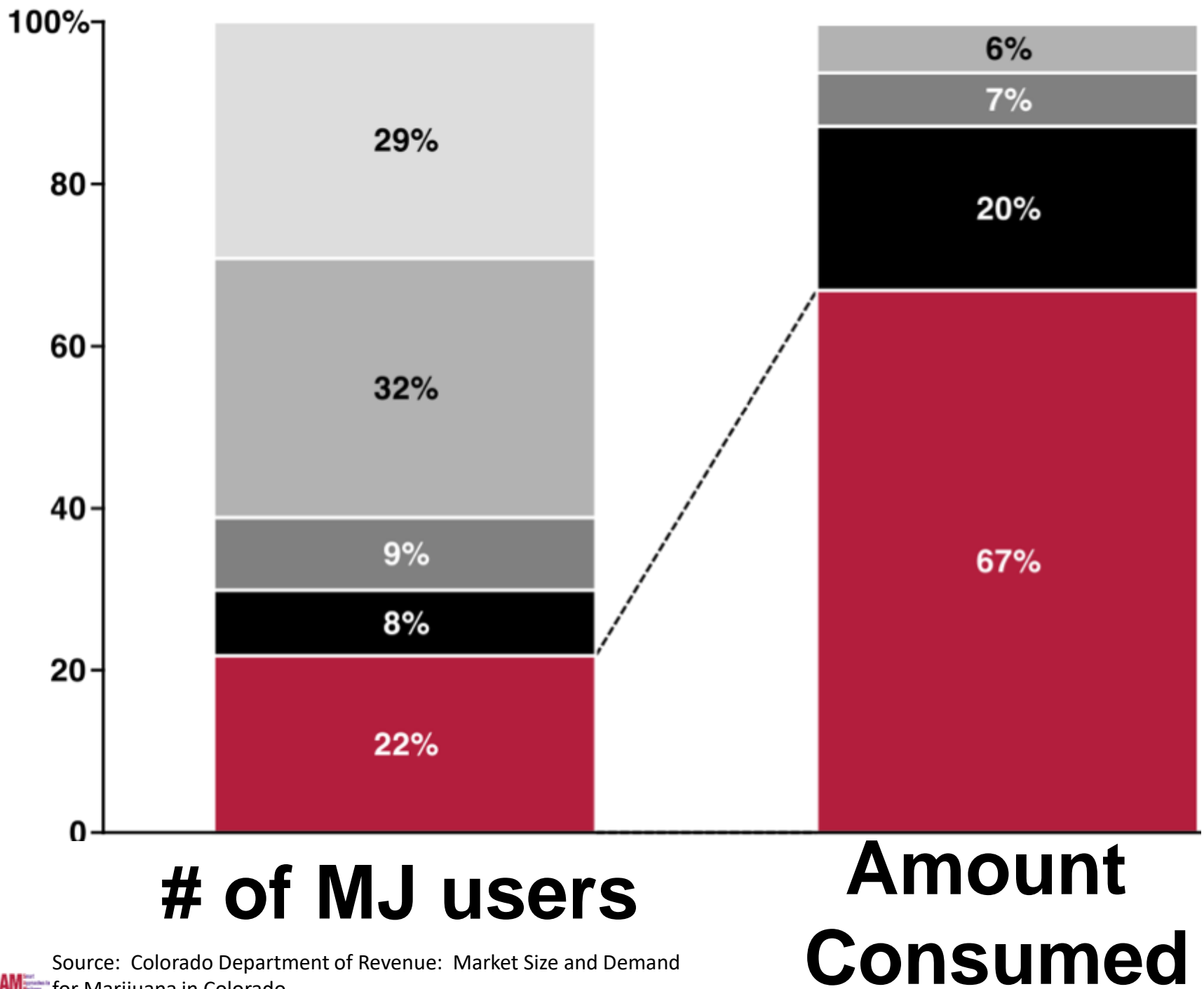
The New York Times

BAT Pulls Ahead in U.S. Vaping Battle, Shares Jump

British American Tobacco plans to test its new Eclipse tobacco heating device in the United States this year, allowing it to pull ahead of Philip Morris in the world's biggest vaping market.

# The top 10% of the population make up 75% of the alcohol industry's U.S. sales





Source: Colorado Department of Revenue: Market Size and Demand for Marijuana in Colorado

# Safer than alcohol?

- Is alcohol legal because its safe?
- Marijuana's effects last longer
- Abusers report **far more problems** at home, work, and school
- **People rarely substitute pot for booze—**they mix them instead
- Lots of people drink; **very few use marijuana—**despite what you see on TV



# Causal Relationship between marijuana and mental illness

Case Reports in Medicine

Volume 2009, Article ID 321456, 2 pages


<http://dx.doi.org/10.1155/2009/321456>

## Case Report

### Suicidal Ideation Induced by Episodic Cannabis Use

Michele Raja<sup>1,2</sup> and Antonella Azzoni<sup>2</sup>

 Abstract

 Full-Text PDF

 Full-Text HTML

 Full-Text ePUB

 Full-Text XML

 Linked References

## 3. Discussion

In patient's life, suicidal ideation presented in two different occasions, only immediately after acute cannabis intoxication. This strongly suggests the **causal** relationship between intoxication and suicidal ideation.

There is a convincing relationship between suicidal behavior and cannabis use, the latter awakening depressive experiences [3]. Rates of cannabis abuse are elevated among those being treated for depression [4, 5] and among those making a suicidal attempt [6]. In a sample of Italian students, the use of cannabis was associated with suicide risk [7]. In a population of French adolescents, cannabis use appeared to be an independent predictor of suicidal ideation after controlling the depressive symptoms [8]. In a cohort study of young Norwegians, cannabis by itself seemed not to lead to depression but was associated with later suicidal thoughts and attempts [9].





September 12, 2017

## Cannabis Use May Be Causally Related to Depression and Suicidal Ideation

*Peter Roy-Byrne, MD reviewing Agrawal A et al. Lancet Psychiatry 2017 Sep*

*In an analysis of twins discordant for frequent cannabis use, common predisposing factors did not fully explain these associations.*

Epidemiologic studies have found associations between cannabis use and both depression and suicidality (thoughts or behaviors) but have not determined whether the associations are causal or attributable to confounding factors or common genetic vulnerabilities. To control for common genetic and family environmental factors, researchers examined the associations in 13,986 Australian twins (6181 monozygotic and 7805 dizygotic twins) drawn from three registry studies between 1992 and 2009. Within twin pairs discordant for cannabis use, persistence of the association in the cannabis-using twin would suggest that use is causally related to depression and suicidality.

In the entire sample, early cannabis use and frequent use were associated with major depression and suicidal ideation and attempt. Analyses of twin pairs who were discordant for early versus later or no use did not yield consistent findings. However, within monozygotic twin pairs discordant for frequent versus limited or no use, frequent use was associated with depression (odds ratios: compared with no or limited use, 1.68; compared with lighter use, 1.98) and suicidal ideation (ORs, 2.35 and 2.47, respectively).

### COMMENT

This study suggests a causal relationship between frequent cannabis use and both major depression and suicidal ideation. This relationship may be mediated both via effects of the cannabinoid system on mood and via environmental factors related to cannabis use itself (e.g., increased trauma exposure, diminished life opportunities, other associated drug use). The analysis is limited by the possibility that not all confounders were accounted for and by arbitrary thresholds used to define early use and frequency of use. The results provide a counterpoint of caution against the increasing promotion of cannabis use as a therapeutic tool for various medical conditions.

## Science News

*from research organizations*

### Causal links between cannabis, schizophrenia: New evidence

**Date:** December 19, 2016

**Source:** University of Bristol

**Summary:** People who have a greater risk of developing schizophrenia are more likely to try cannabis, according to new research, which also found a causal link between trying the drug and an increased risk of the condition.

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These can often present as a “psychotic episode” – which is a relatively sudden worsening of psychotic symptoms over a short time-frame, frequently resulting in hospitalisation.

The heaviest users of cannabis are around four times as likely to develop schizophrenia (a psychotic disorder that affects a person’s ability to think, feel and behave clearly) than non-users. Even the “average cannabis user” (for which the definition varies from study to study) is around twice as likely as a non-user to develop a psychotic disorder.

Furthermore, these studies found a **causal** link between tetrahydrocannabinol (THC - the plant chemical which elicits the “stoned” experience) and psychosis. This means the link is not coincidental, and one has actually **caused** the other.

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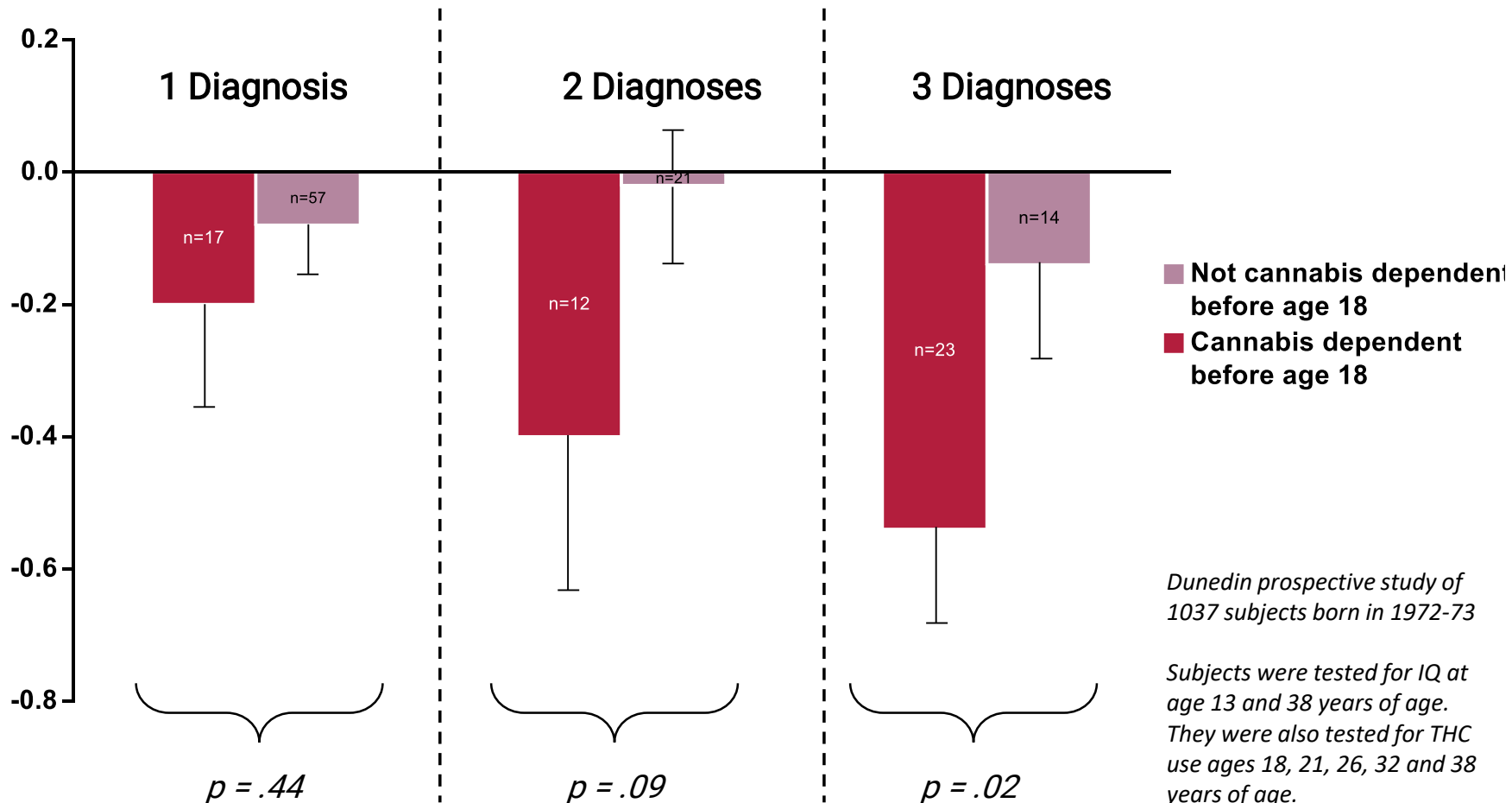
# Hyperemesis Syndrome

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[https://www.youtube.com/watch?v=AcT4mC\\_b2yg&feature=youtu.be](https://www.youtube.com/watch?v=AcT4mC_b2yg&feature=youtu.be)

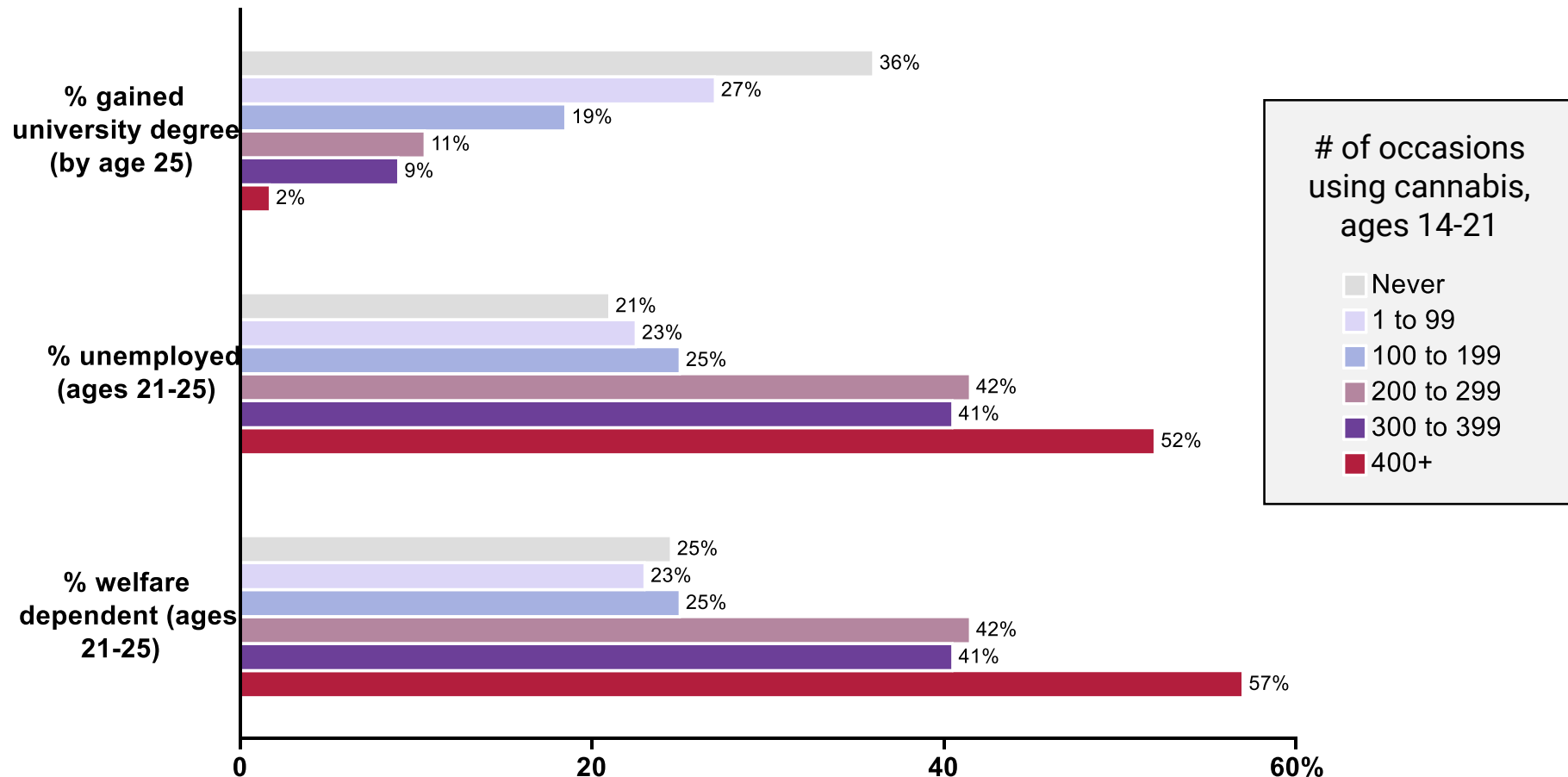
# Lower IQ among adolescents—losses of up to 8 points—is correlated with marijuana use

Change in full-scale IQ  
(standard deviation units)



# Marijuana use corresponds with undesirable social outcomes such as unemployment

## New Zealand study showing relationship between marijuana use and social outcomes





# The Industry Today



First 200\* receive  
a gift bag containing  
one joint, one sample of  
premium flowers,  
and a Bite from  
Bliss Edibles  
\*with \$10 donation minimum



1



**Kid-friendly:** comes in  
shapes & colors  
attractive to children, like  
**candy and soda**

2

**95%**

**Potent:** often made w/  
concentrates of up to  
**95% pure THC** (joints  
are ~ 15% THC)

3



**Aggressive marketing:**  
free samples, billboard  
advertising, and other **Big  
Tobacco** tactics

4



**Contaminants:** In 2015, CO  
recalled 100s of thousands  
of edibles containing  
**banned pesticides**

5



**Fighting regulation:** The pot industry has lobbied  
hard against regulation (e.g., warning labels,  
dosing rules, and bans on ads targeting kids)

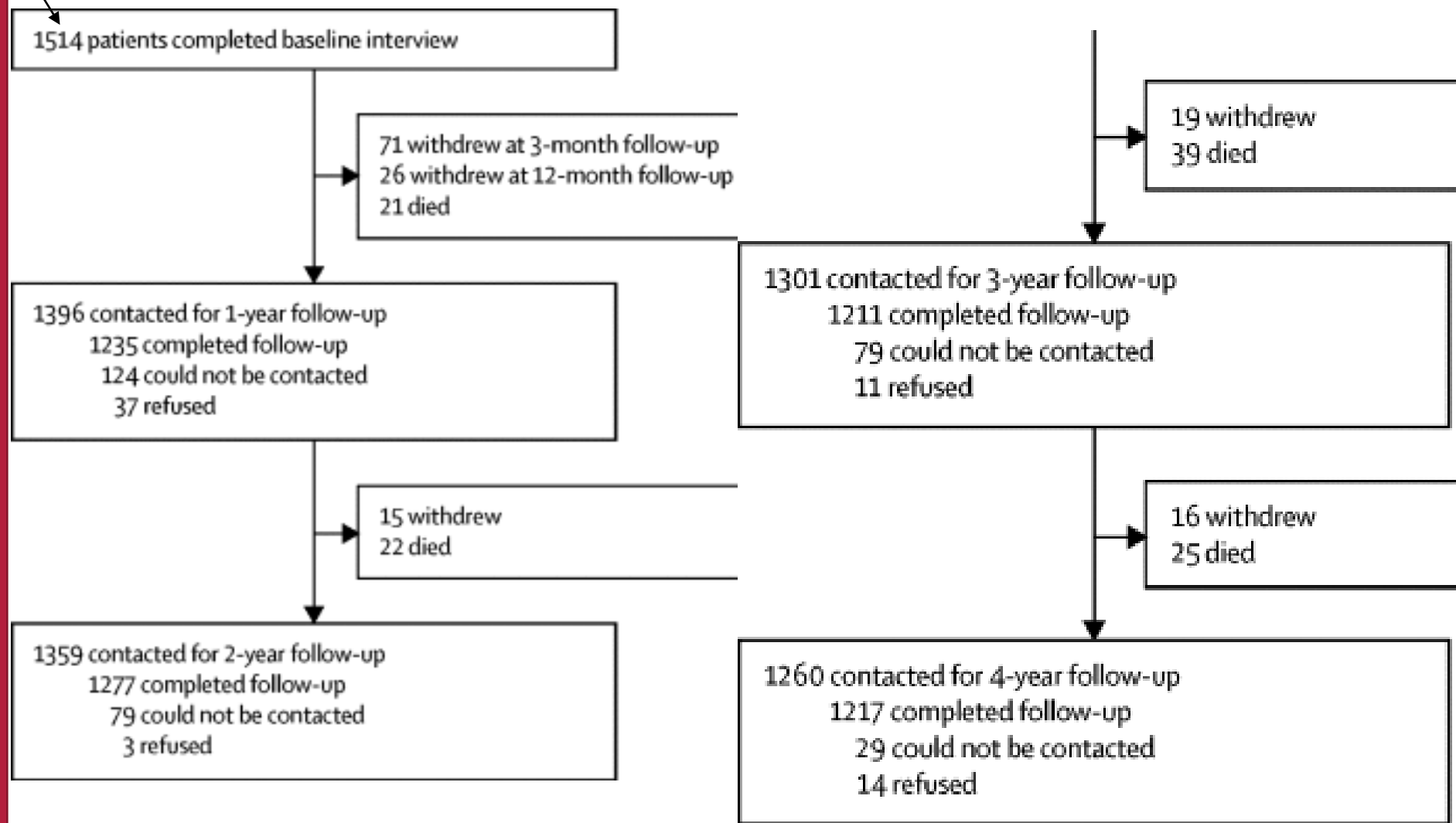


## RESTORATIVE WINE OF COCA.

**F**OR NERVOUS PROSTRATION, BRAIN EXHAUSTION, DEPRESSION OF SPIRITS, MENTAL AND PHYSICAL DEBILITY, NEURASTHENIA, SICK HEADACHE, NEURALGIA, CASES OF THE OPIUM, TOBACCO, ALCOHOL, OR CHLORAL HABIT, WEAK STATES OF THE VOICE, CONVALESCENCE FROM EXHAUSTION OR EXHAUSTIVE DISEASES, LOSS OF APPETITE, GASTRIC CATARRH, NERVOUS AND OTHER FORMS OF DYSPEPSIA, WEAK STATES OF THE GENERATIVE SYSTEM, WEAKNESS OF OLD AGE, ETC., ETC.

**The best-known Preparation of that inestimable remedy, Coca, is OUR RESTORATIVE WINE OF COCA,** containing, as it does, all the medicinal virtues without any of the deleterious principles of the leaves. There are many Wines of Coca. We invite a comparison on the points of taste, strength, and curative properties of ours with any Wine ever manufactured. It is already before the profession, and in less than two years has abolished the use of several Wines of Coca, and greatly lessened the sales of others which had previously almost monopolized the market.

# Lancet Study



# *Lancet* Conclusions

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- No evidence that cannabis use improved patient outcomes;
- Those who used cannabis had **greater pain and lower self-efficacy in managing pain**
- No evidence that cannabis use reduced pain interference or exerted an opioid-sparing effect



# Medical Marijuana Users are More Likely to Use Prescription Drugs Medically and Nonmedically

Caputi, Theodore L., BS; Humphreys, Keith, PhD

Journal of Addiction Medicine: July/August 2018 - Volume 12 - Issue 4 - p 295–299

doi: 10.1097/ADM.0000000000000405

Original Research

BUY

SDC

Abstract

Author Information

**Objectives:** Previous studies have found a negative pop availability in US states, and trends in medical and nonm interpreted as evidence that use of medical marijuana re This study evaluates whether medical marijuana use is a prescription drug use.

**Methods:** Simulations based upon logistic regression an Use and Health were used to compute associations betw prescription drug use. Adjusted risk ratios (RRs) were co status, family income, and living in a state with legalized

**Results:** Medical marijuana users were significantly mor to report medical use of prescription drugs in the past 12 also significantly more likely to report nonmedical use in 95% CI 1.67–2.62), with elevated risks for pain relievers CI 1.09–3.02), and tranquilizers (RR 2.18, 95% CI 1.45–

**Conclusions:** Our findings disconfirm the hypothesis tha marijuana use and prescription drug harms occurs beca prescription drugs, either medically or nonmedically. Med efforts to combat nonmedical prescription drug use.

“Our findings **disconfirm** the hypothesis that a population-level negative correlation between medical marijuana use and prescription drug harms occurs because medical marijuana users are less likely to use prescription drugs, either medically or nonmedically. **Medical marijuana users should be a target population** in efforts to combat nonmedical prescription drug use.”

# 2018 in *JAMA Internal Medicine*

## “The opioid crisis appears to be worsening where marijuana has been legalized.”

At the start of the 2010-2016 period, the annual age-adjusted opioid death rate in legalizing and nonlegalizing jurisdictions was the same, with overlapping 95% CIs between 8.0 and 8.5 deaths per 100 000 people. Whereas the nonlegalizing states subsequently had no increase in their opioid death rate until 2014, the monthly rate in the legalizing jurisdictions increased steadily during 2010 through 2013 at 4.5% per year ( $P < .001$ ), while 5 states and the District of Columbia legalized medicinal marijuana, and 2 states legalized recreational use. Thereafter, the legalizing jurisdictions' death rate distinctly accelerated, first to 16.4% per year ( $P < .001$ ) until October 2015 and then to 33.5% per year ( $P < .001$ ) as 12 more states approved medicinal marijuana and 2 more states and the District of Columbia approved recreational use. In the nonlegalizing states, the opioid death rate increased during 2014 through 2016 but more slowly (16.4% per year) than in the legalizing jurisdictions. In 2016, the mean (95% CI) age-adjusted death rate per 100 000 people was 18.2 (18.0-18.4) and 13.2 (13.0-13.4) in the legalizing and nonlegalizing jurisdictions, respectively. As of December 2016, the rate in the legalizing states and the District of Columbia was 52% higher than, and continuing to diverge from, the rate in nonlegalizing states. Areas under the joinpoint regression curves suggest that 20.34 (72%) of 28.19 additional deaths per 100 000 people during January 2010 through December 2016 occurred where marijuana was legalized.

The opioid crisis appears to be worsening where marijuana has been legalized, despite fewer opioid prescriptions, and as such, constitutes evidence for the gateway hypothesis and against the marijuana protection hypothesis. In any event, before other states rush to legalize marijuana and risk worsening the opioid crisis, the marijuana-opioid interaction should be more definitively researched.



# MARIJUANA USE CAN DECREASE PAIN THRESHOLDS, REQUIRING MORE MEDICATION.

## PATIENT SAFETY IN SURGERY, 2018<sup>3</sup>

Researchers found that patients reporting marijuana use actually experienced *more* pain on average when admitted to the hospital following a traumatic injury than those that did not. Compared to non-users, they required more opioid medication to cope with the pain and consistently rated their pain higher during the duration of their stay.

# MARIJUANA IS OFTEN USED WITH OTHER SUBSTANCES.

## THE AMERICAN JOURNAL OF PSYCHIATRY, 2016<sup>4</sup>

Regular use of marijuana is linked with increased risk of developing cannabis use disorder, higher rates of mental illness and higher rates of co-substance abuse with alcohol, among other drugs.

<sup>3</sup> Salottolo, K., Peck, L., Tanner II, A., Carrick, M. M., Madayag, R., McGuire, E., & Bar-Or, D. (2018). The grass is not always greener: a multi-institutional pilot study of marijuana use and acute pain management following traumatic injury. *Patient Safety in Surgery*, 12(1), 16.

<sup>4</sup> Hasin, D. S., Kerridge, B. T., Saha, T. D., Huang, B., Pickering, R., Smith, S. M., ... & Grant, B. F. (2016). Prevalence and correlates of DSM-5 cannabis use disorder, 2012-2013: findings from the National Epidemiologic Survey on Alcohol and Related Conditions-III. *American Journal of Psychiatry*, 173(6), 588-599.

# National Academy of Sciences report

## EXPOSURE

Smoking cannabis during pregnancy is linked to lower birth weight in the offspring.

The relationship between smoking cannabis during pregnancy and other pregnancy and childhood outcomes is unclear.

A limited number of studies suggest that there are impairments in cognitive domains of learning, memory, and attention in individuals who have stopped smoking cannabis.

Cannabis use during adolescence is related to impairments in subsequent academic achievement and education, employment and income, and social relationships and social roles.

## PROBLEM CANNABIS USE

Greater frequency of cannabis use increases the likelihood of developing problem cannabis use.

Initiating cannabis use at a younger age increases the likelihood of developing problem cannabis use.

## MENTAL HEALTH

Cannabis use is likely to increase the risk of developing schizophrenia and other psychoses; the higher the use the greater the risk.

In individuals with schizophrenia and other psychoses, a history of cannabis use may be linked to better performance on learning and memory tasks.

Cannabis use does not appear to increase the likelihood of developing depression, anxiety, and posttraumatic stress disorder.

For individuals diagnosed with bipolar disorders, near daily cannabis use may be linked to greater symptoms of bipolar disorder than non-users.

Heavy cannabis users are more likely to report thoughts of suicide than non-users.

Regular cannabis use is likely to increase the risk for developing social anxiety disorder.

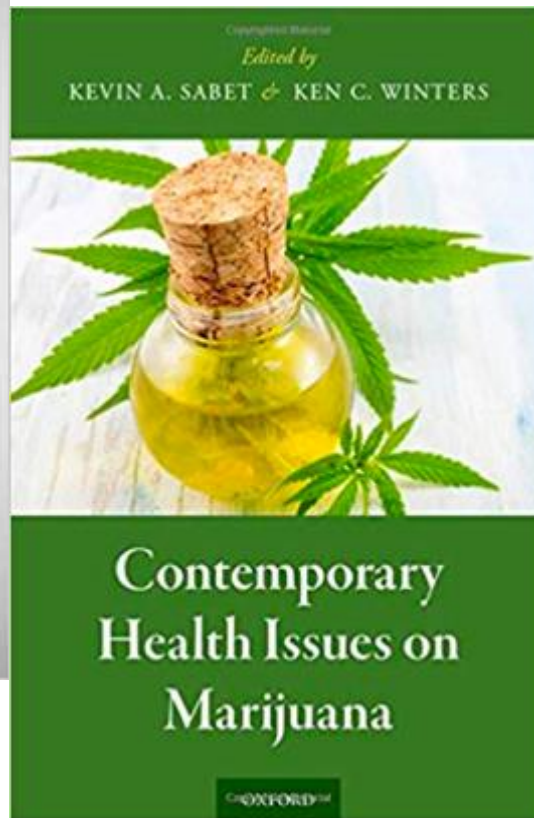
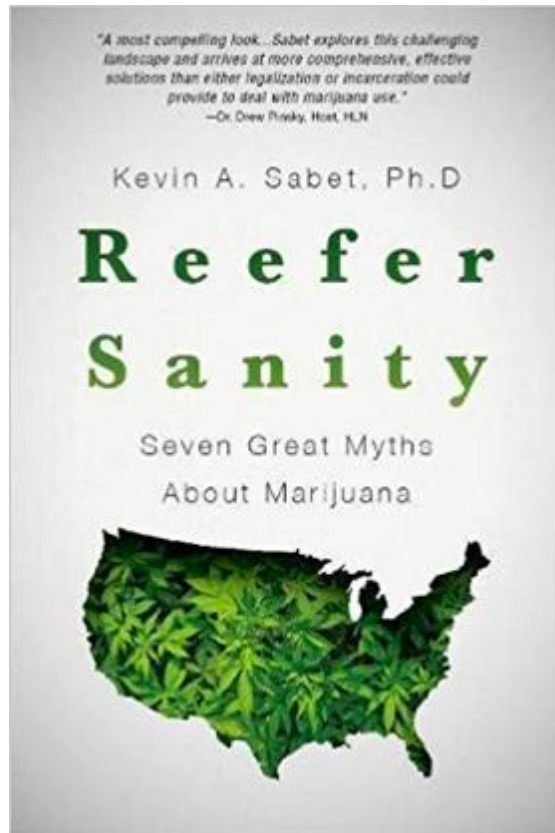
## CANNABIS USE AND ABUSE OF OTHER SUBSTANCES

Cannabis use is likely to increase the risk for developing substance dependence (other than cannabis use disorder).

TO READ THE FULL REPORT AND VIEW  
RELATED RESOURCES, PLEASE VISIT

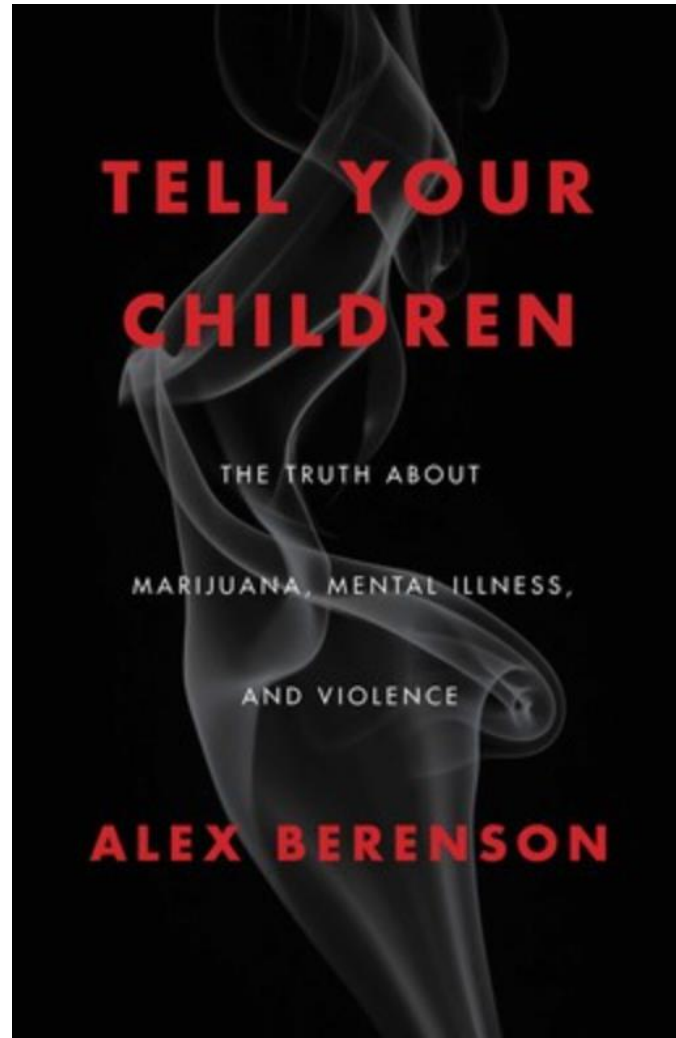
**NATIONALACADEMIES.ORG/  
CANNABISHEALTHEFFECTS**

# Resources



[Drugabuse.gov](http://Drugabuse.gov)  
[LearnaboutSAM.org](http://LearnaboutSAM.org)  
[MarijuanaReport.org](http://MarijuanaReport.org)

# New Book Is Changing the Debate

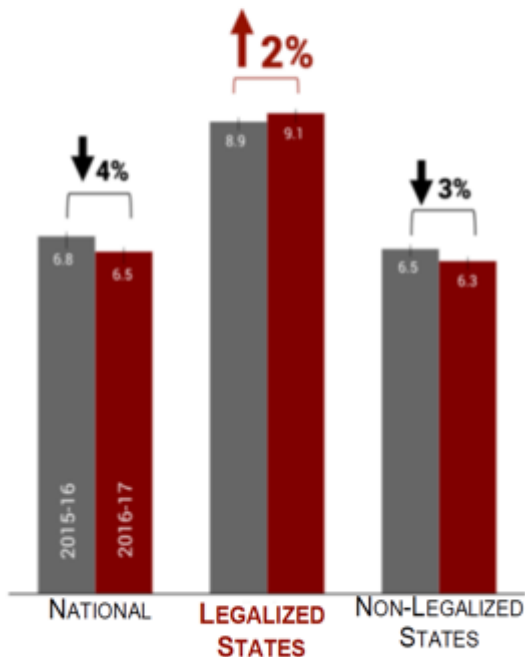




# Youth Use

YOUTH MARIJUANA USE CONTINUES TO RISE IN STATES THAT HAVE LEGALIZED.

PAST MONTH USE AMONG 12-17 YEAR-OLDS



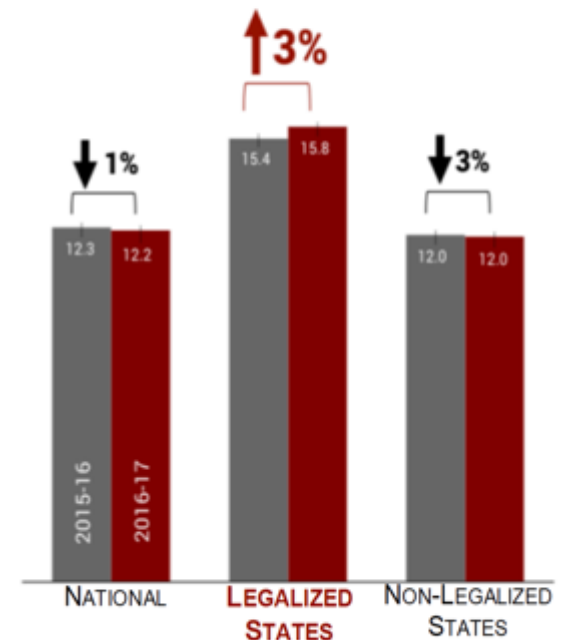
\*Percent change represented as the calculated delta between years [(New-Old)/Old]  
NSDUH State Estimates, 2016-17

**1 in 5 Youth**  
&  
**1 in 10 Young Adults**

Who started using marijuana more than 3 years ago  
have been diagnosed with  
**CANNABIS USE DISORDER**  
in the past 12 months.

Han et al., 2018  
(Data from NSDUH 2015-2017)

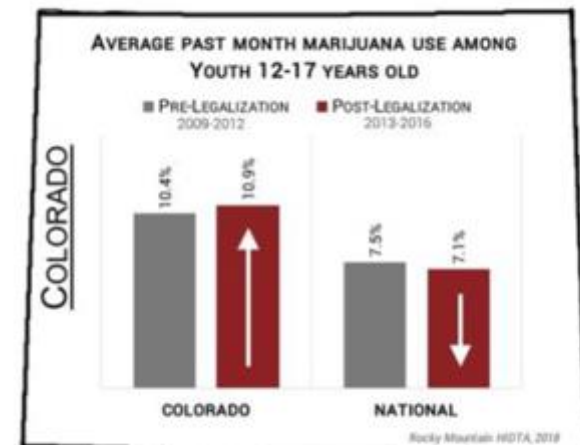
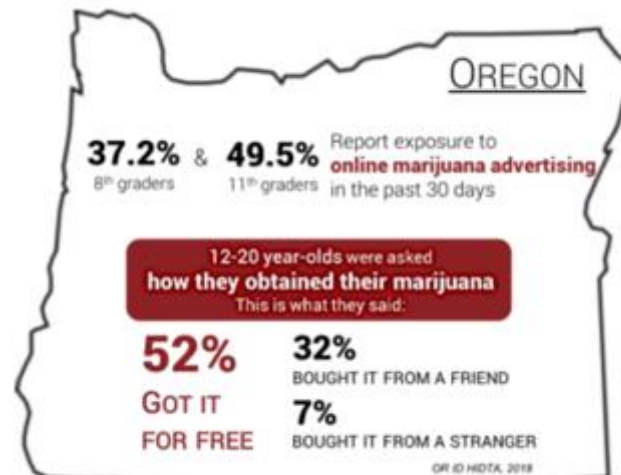
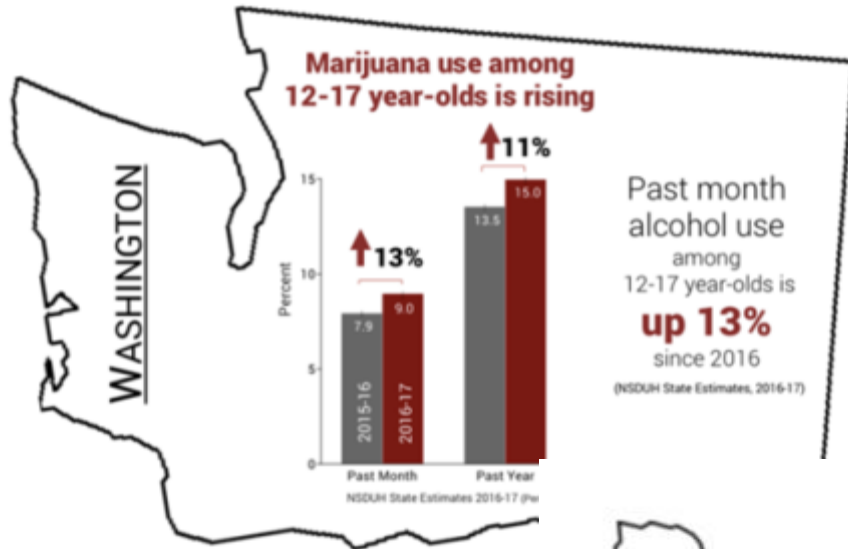
PAST YEAR USE AMONG 12-17 YEAR-OLDS



\*Percent change represented as the calculated delta between years [(New-Old)/Old]  
NSDUH State Estimates, 2016-17

# Youth Use

REGULATED MARKETS ONLY INCREASE EXPOSURE AND PROMOTE THE NORMALIZATION OF YOUTH MARIJUANA USE.







**Contact us**

**[www.learnaboutsam.org](http://www.learnaboutsam.org)**

**[info@learnaboutsam.org](mailto:info@learnaboutsam.org)**