


Marijuana Legalization: The Impact on Youth

Luke D. Niforatos
Executive Vice President, SAM

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What is SAM?



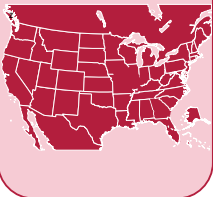
- A 501(c)(3) non-profit, educational organization funded by volunteers & private organizations
- Our mission:
 - Educate citizens on the science of marijuana
 - Promote health-first, smart policies and attitudes that decrease marijuana use and its consequences

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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



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Groups SAM has collaborated with

- American Society of Addiction Medicine
- American Academy of Pediatrics
- 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

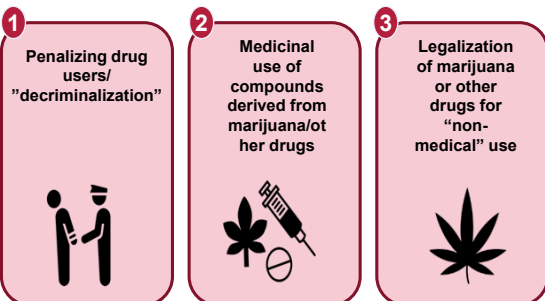
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The false dichotomy: "Legalization OR incarceration?"



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Three separate issues that often get conflated:



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"While laboratory animals are an expensive way of understanding the risks of cannabis use, **North Americans come free.**"

The Economist (2019)

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IDEAS AND OPINIONS | 2 APRIL 2020

Collision of the COVID-19 and Addiction Epidemics

Nora D. Volkow, MD
Article, Author, and Disclosure Information

Risk for severe COVID-19 and death escalates with older age but is also concentrated among those who are immunocompromised or have underlying health conditions, including diabetes, cancer, and heart and respiratory diseases. Many of the latter arise from smoking and thus may increase risk for death and illness among smokers (tobacco or cannabis). Data from the Chinese Center for Disease Control and Prevention have suggested that COVID-19 has a case fatality rate of 6.3% for

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Vaping Crisis = **#PotVapingCrisis**

- **80+% of the lung illnesses** being reported are linked to THC vapes
- **1 in 6 illnesses** came from the legal marijuana market
- **Two deaths** in Oregon have been tied to marijuana oil purchased from a state licensed dispensary

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Toledo man's hospitalization possibly linked to vaping
A Toledo man hospitalized at Toledo ProMedica Hospital could be suffering from the latest local case of an e-cigarette-related lung ...
toledoblade.com

"... he thought it was safer, especially because he never bought cartridges off the street."

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U.S. Surgeon General Jerome Adams:
"This isn't your mother's marijuana, the marijuana of today is significantly more potent"



Health
'A dangerous drug': Surgeon general warns against marijuana use by pregnant women, youths

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4TH LARGEST TOBACCO COMPANY ON EARTH INVESTS IN BIG MARIJUANA

Auxly Cannabis signs \$123M deal with tobacco giant Imperial Brands

f in t e

Vancouver firm will get global licences to the British tobacco company's vaping technology

The Canadian Press - Posted: Jul 25, 2019 1:19 PM ET | Last Updated: July 25

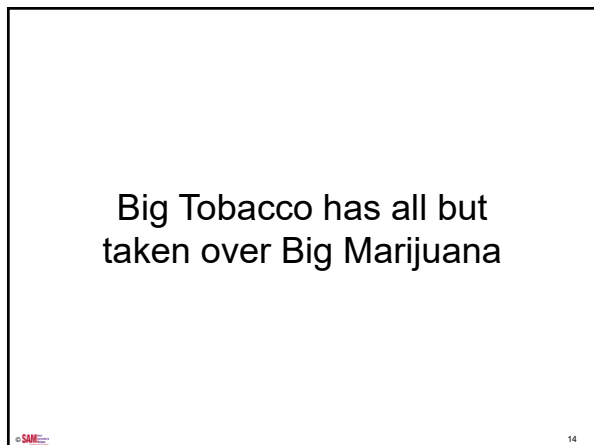


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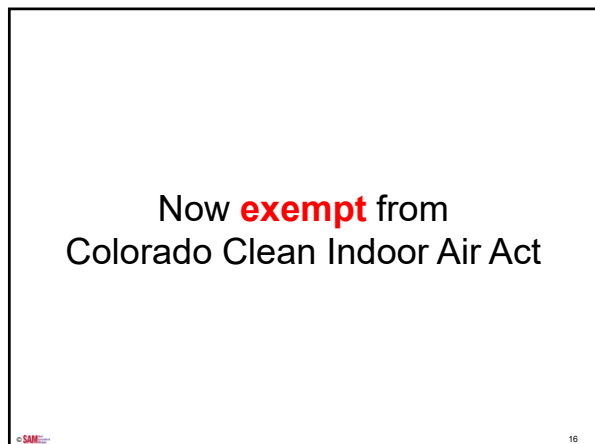
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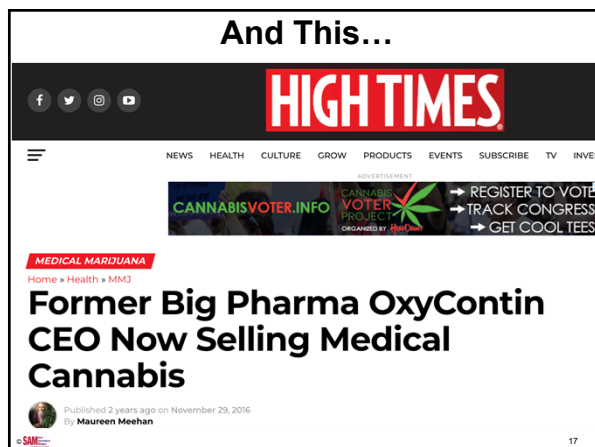
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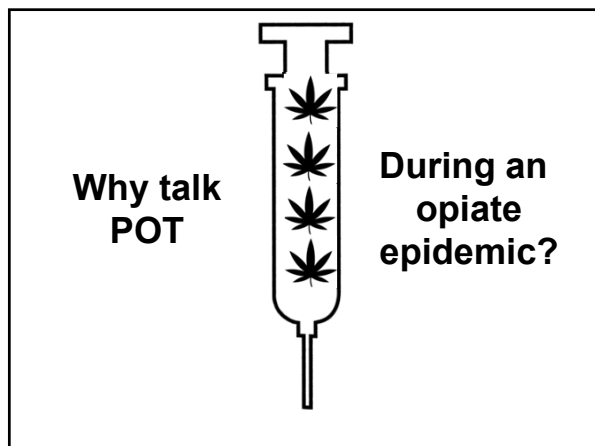
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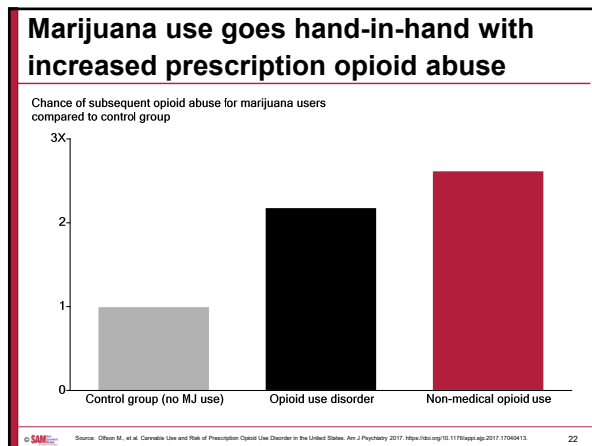
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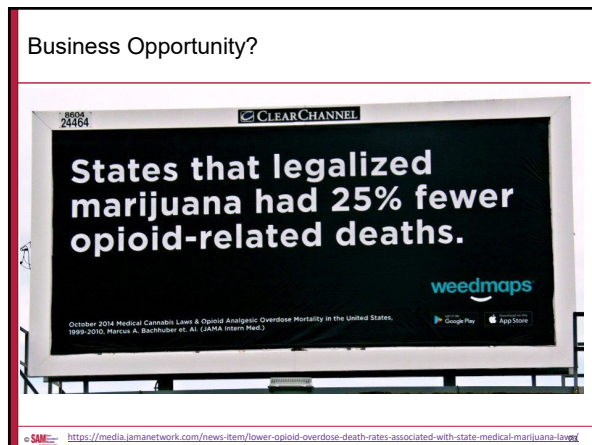
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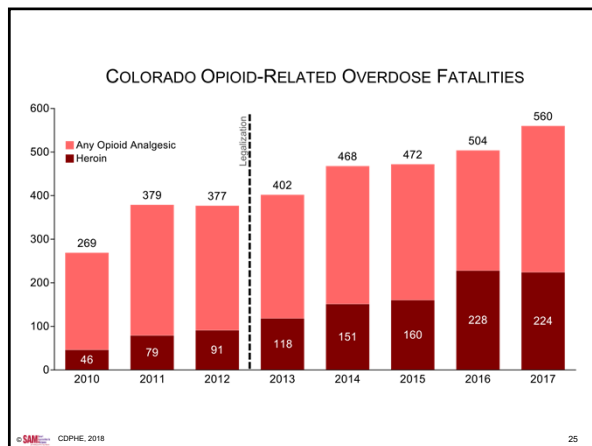
2019: JAMA Updated Opioid Study

Medical marijuana was associated with a 23% INCREASE in opioid deaths.

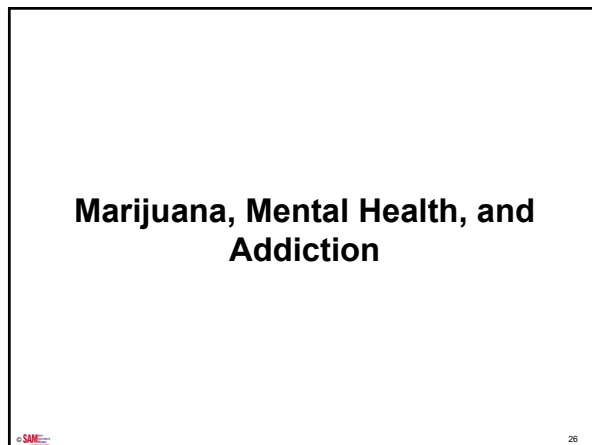
The authors also said "We find it unlikely that medical marijuana-used by about 2.5% of the US population-has exerted large conflicting effects on opioid overdose mortality. A more plausible interpretation is that this association is spurious."

Source: <https://doi.org/10.1093/jama.2018.178091>

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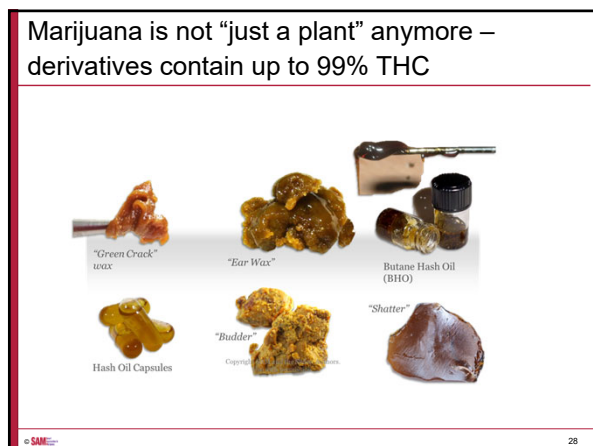
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Cannabinoid Receptors Are Located Throughout the Brain and Regulate a Host of Brain Activity

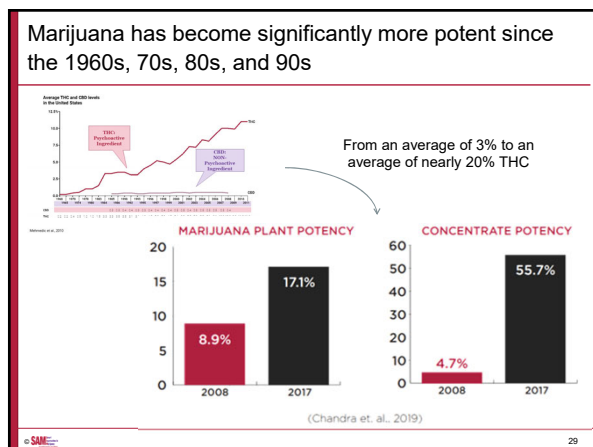
- Brain Development
- Memory & Cognition
- Motivational Systems & Reward
- Appetite
- Immunological Function
- Reproduction
- Movement Coordination
- Pain Regulation & Analgesia

© SAME Source: NIDA 27

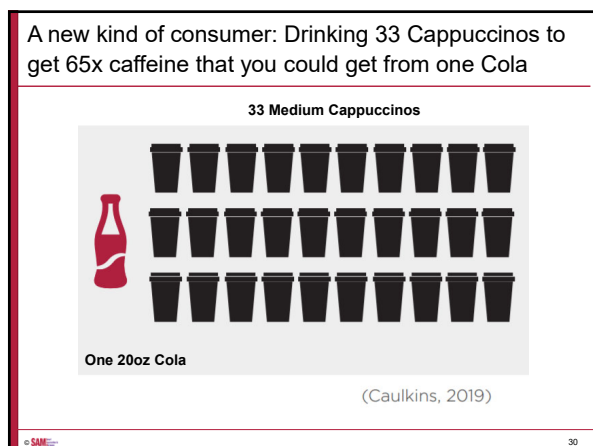
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Marijuana is often mistaken as medicine in spite of some well-studied adverse outcomes

Studies have shown marijuana (especially high THC-containing products) to be largely ineffective or else dangerous for a host of ailments.

Marijuana is not a proven aid for mental illnesses.

Marijuana use appears to exacerbate mental illness, rather than alleviating it.

Study	Finding
Hasin et al., American Journal of Psychiatry (2020)	Adults with pain are "increasingly vulnerable to adverse cannabis use outcomes," and more often reported Cannabis Use Disorder (CUD).
Caspi et al., PLOS One (2020)	The average concentration of THC across states was two to three times the concentration known to be efficacious for the treatment of pain and a "vast majority of products... including medical-only programs, contained THC designed for recreational use (i.e. >15%)."
Hindley et al., Lancet Psychiatry (2020)	Findings suggest that a "single THC administration induces psychotic, negative, and other psychiatric symptoms with large effect sizes." There was no "consistent evidence" that CBD either "induces symptoms or moderates effects of THC."
Kayser et al., Depression and Anxiety (2020)	Smoked marijuana (THC-dominant or CBD-dominant) has "little acute impact on OCD symptoms and yields smaller reductions in anxiety compared to placebo."
Black et al., Lancet Psychiatry (2019)	There is "scarce evidence" that marijuana can improve depressive disorders, anxiety disorders, ADHD, Tourette syndrome, PTSD, or psychosis.
Friedman et al., Lancet Neurology (2019)	Small clinical trials have found no effect from cannabinoids on Huntington's disease, ADHD, and dementia.
Mücke et al., Cochrane Database of Systematic Reviews (2018)	A review of 16 studies with 1,750 participants demonstrated that the "potential benefits of cannabis-based medicine (herbal cannabis, plant-derived or synthetic THC, THC/CBD oromucosal spray) in chronic neuropathic pain might be outweighed by their potential harms."
Stockings et al., Pain (2016)	Evidence does not indicate that cannabinoids are effective at mitigating chronic non-cancer pain.

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Lancet 2019 Population-Level Study Conclusions

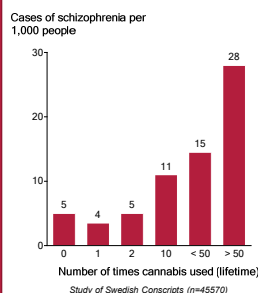
5x

- Regular high potency marijuana users are 5 times **more likely to develop psychosis.**
- Compared to 3 times more likely for regular users of lower potency marijuana of the past.

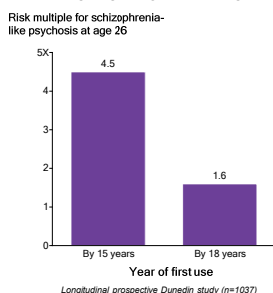
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Pot use is strongly correlated with psychosis

MORE MARIJUANA USE CORRELATES WITH HIGHER RATES OF SCHIZOPHRENIA



EARLIER AGE OF USE CORRELATES WITH INCREASED SCHIZOPHRENIA RISK



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2019 JAMA Study: Marijuana use contributes to depression

Other Key Findings:

- Marijuana didn't replace opioid use
- Patients using opioids, **supplementing with marijuana**, were more likely to develop depression, addiction to cocaine and other drugs, and other adverse outcomes.

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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^{1,2} and Antonella Azzoni²

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].

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ScienceDaily
Your source for the latest research news

Science News from research organizations

Causal links between cannabis, schizophrenia: New evidence

Date: December 19, 2016
Source: University of Bristol

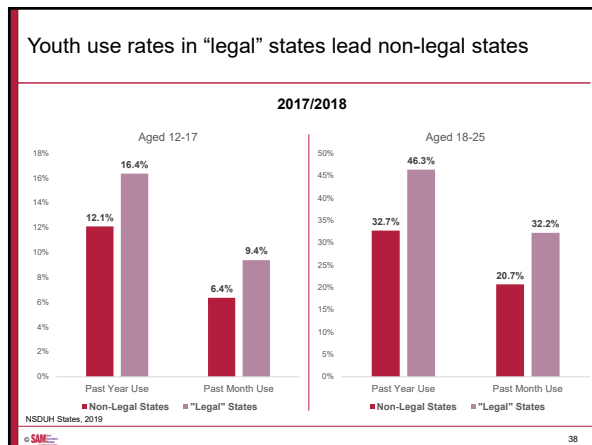
Summary: People who have a greater risk of developing schizophrenia are more likely to try cannabis, according to new research, which also found a causal link between trying the drug and an increased risk of the condition.

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The consequences: RML is associated with an increase in youth Cannabis Use Disorder (CUD)

Association Between Recreational Marijuana Legalization in the United States and Changes in Marijuana Use and Cannabis Use Disorder From 2008 to 2016:

- States that legalized recreational marijuana experienced a near 25% increase in CUD among 12 to 17 year-olds.
- Youth in states with RML (Recreational Marijuana Legalization) experienced CUD at a higher rate of 2.72% following legalization, increasing from 2.18% prior to RML enactment.
- These findings indicate a cause for concern as more states look to legalize the drug.

25% INCREASE

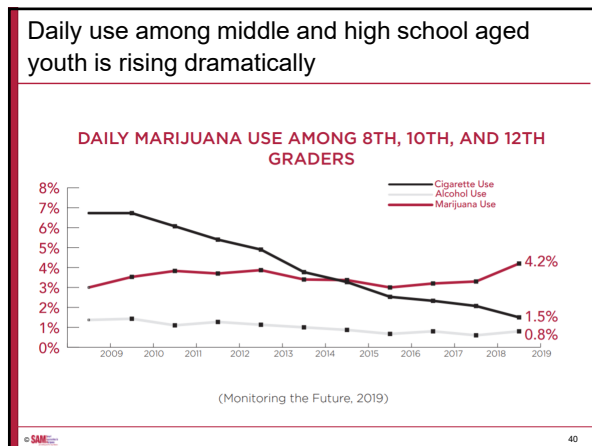
There was a 25% increase in Cannabis Use Disorder (CUD) among 12-17 year-olds in "legal" states.

(Cerde et al., 2019)

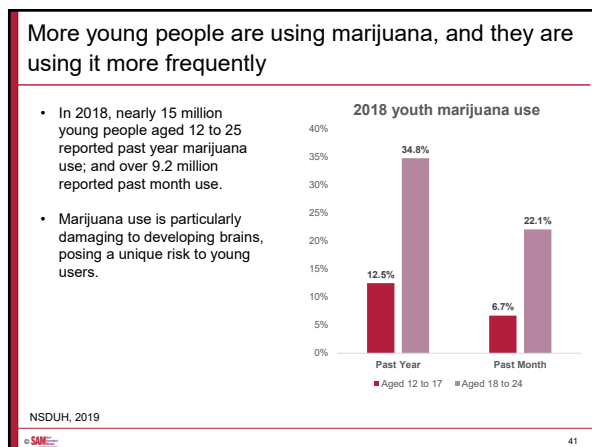
Cerde et al., 2019

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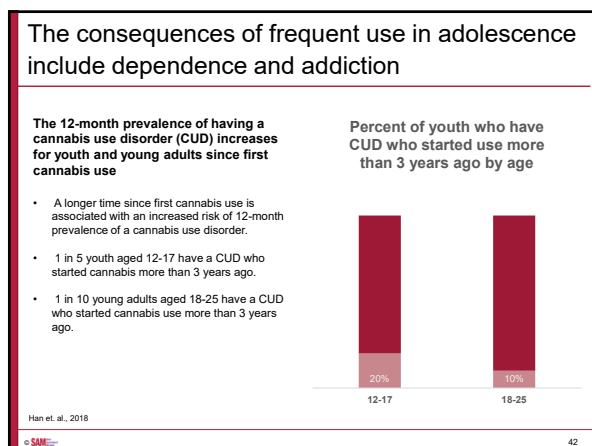
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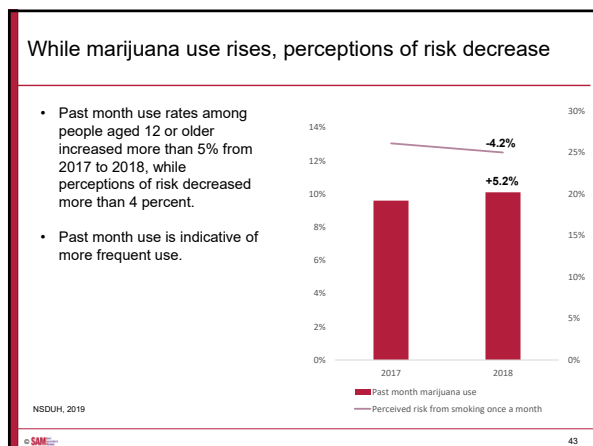
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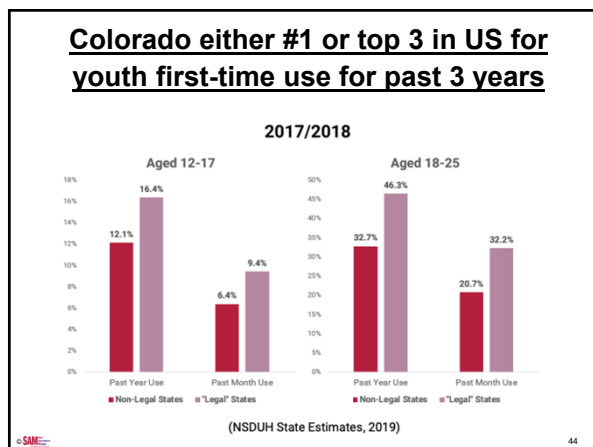
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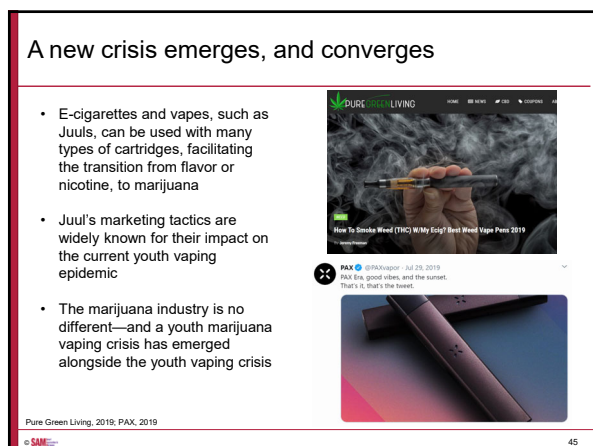
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Youth e-cigarette use is connected to marijuana vaping

August 12, 2019

BMJ Open Vaping cannabis among adolescents: prevalence and associations with tobacco use from a cross-sectional study in the USA

Source: Kowitt, J., Adams, C., et al. (2019). Vaping cannabis among adolescents: prevalence and associations with tobacco use from a cross-sectional study in the USA. *BMJ Open*, 19(8), e026888. doi:10.1136/bmjopen-2019-026888

- A study by Kowitt et al found that **around 1 in 10** high school students reported ever vaping marijuana
- Authors found that youth who had reported using e-cigarettes in the past 30 days were **3.2x more likely** to report vaping marijuana
- Chadi et al found that youth who used e-cigarettes were **3.5x more likely** to report past or current marijuana use
- The study finding echoes Kowitt et al and highlights the relationship between youth vaping and youth marijuana use

Kowitt et al, 2019; Chadi, et al., 2019

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Youth marijuana vaping is on the rise

USA Today

Youth Marijuana Vaping on the Rise, Researchers Say

The number of adolescents reporting to have used THC e-cigarettes in a cross-sectional survey is on the rise.

Teen marijuana vaping is on the rise, a new report says, threatening to 'undo years of progress'

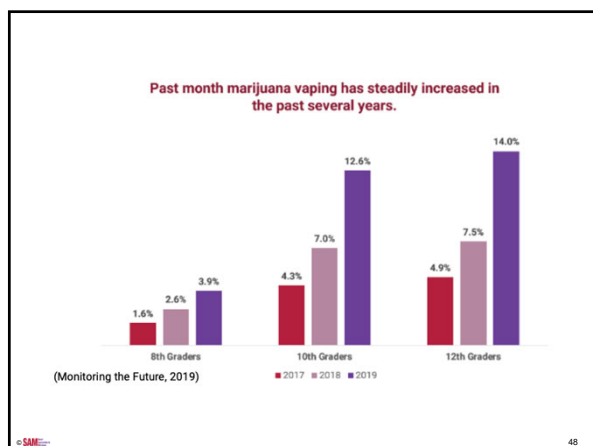
Jayne O'Donnell USA TODAY

Published online 12:00 PM EDT Dec 18, 2019 | Updated 4:07 PM EDT Dec 18, 2019

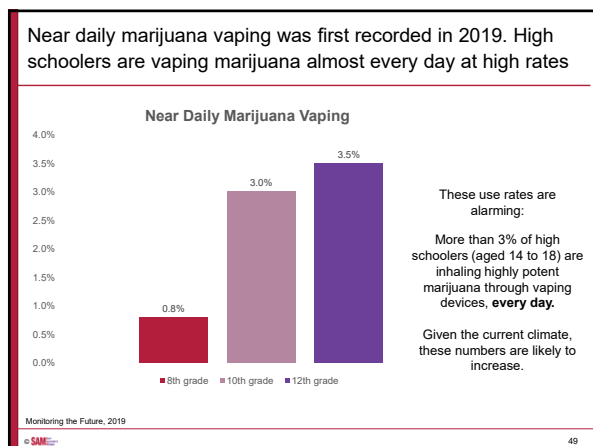
WSJ, 2019; CNN, 2019; USA Today, 2019; New York Times, 2019

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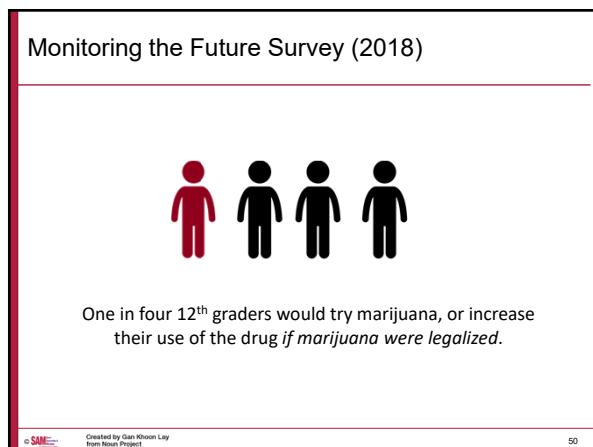
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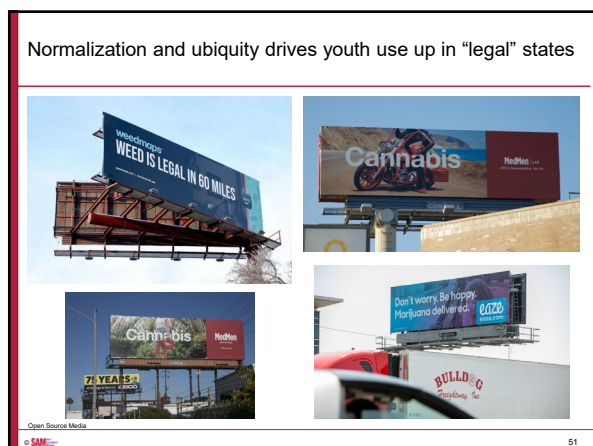
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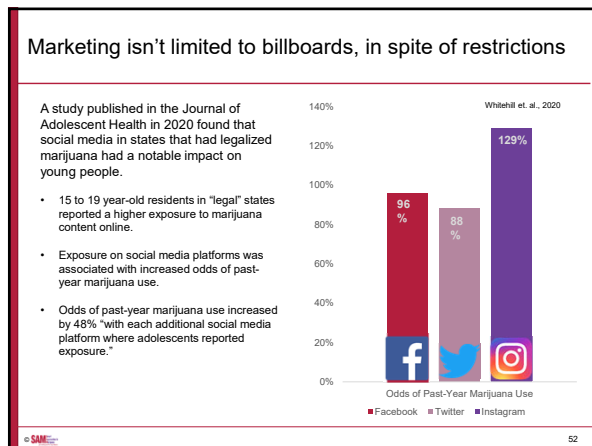
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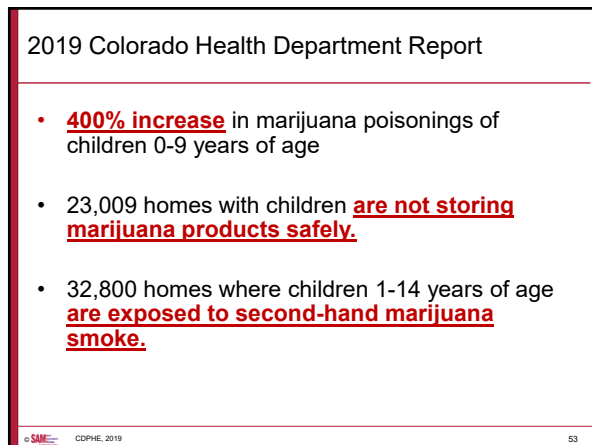
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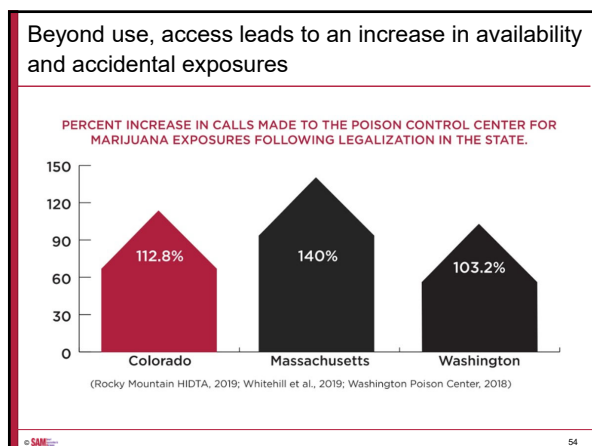
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Young children are unwitting victims

One arrested after marijuana gummy bears sicken Chula Vista students

BY Jessica Chen, Mark Brandon
POSTED: 4:13 PM, Apr 25, 2017
UPDATED: 10:12 AM, Apr 26, 2017

Edible marijuana at Hollywood school sends 14-year-old girl to hospital
Hollywood police officer investigates 'Weedos' marijuana incident

By Kate Heger, Reporter, Southern California Times - Digital Reporter/Producer
Posted: 10:04 PM, April 23, 2018
Updated: 10:04 PM, April 24, 2018

A 9-Year-Old Accidentally Shared Her Grandpa's Marijuana Gummies With Her Fifth-Grade Class




With the right expertise, you can drive an industry forward.

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The rate of children aged 5 and younger exposed to marijuana increased by 147.5 percent

Marijuana exposures are increasing across the country

- The increased occurrence of accidental exposure to marijuana among children is attributed largely to states where medical and recreational marijuana had been legalized.
- 75 percent of exposures were attributed to accidental ingestion of marijuana products.
- Children younger than age 3 accounted for 78 percent of the exposures.



Year	Number of Exposures
2007	111
2008	125
2009	130
2010	190
2011	260
2012	240
2013	280
2014	340
2015	450
2016	617

National Center on Addiction and Substance Abuse - 2018

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Lancet Journal of Psychiatry (2014)

Daily marijuana users under the age of 17:

- Less likely to graduate high school
- More likely to develop addiction
- More likely to use other drugs
- More likely to attempt suicide

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National Academy of Sciences (2012)

1,037 subjects followed from birth to age 38

Persistent marijuana use starting in adolescence:

- Neuropsychological decline
- More cognitive problems
- Stopping later in life didn't restore healthy functioning

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Marijuana use harms academic achievement

Study of 1,253 college students found:

Marijuana use adversely impacts GPA, Class Attendance, and other college outcomes

ASU Study: Persistent marijuana use in high school led to lower GPA, test scores, and external issues.

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Potential consequences?

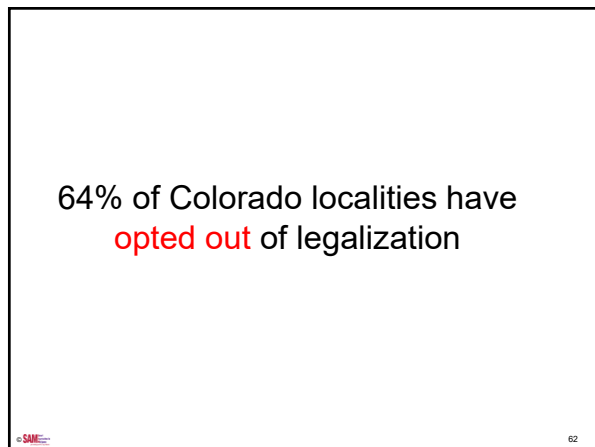
6,800

In a study published in June of 2020, Kamer et al. concluded that the legalization of marijuana may lead to an increase of approximately **6,800 traffic deaths per year.**

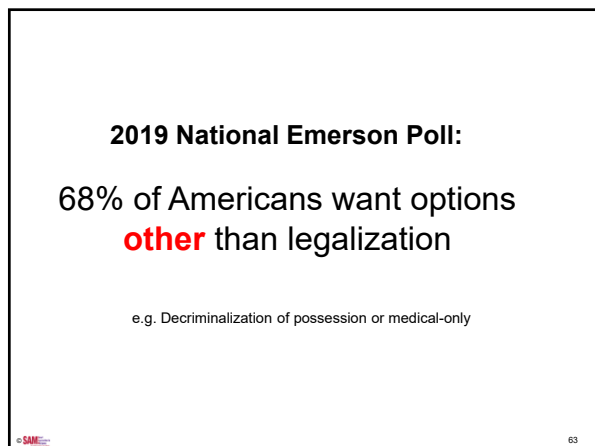
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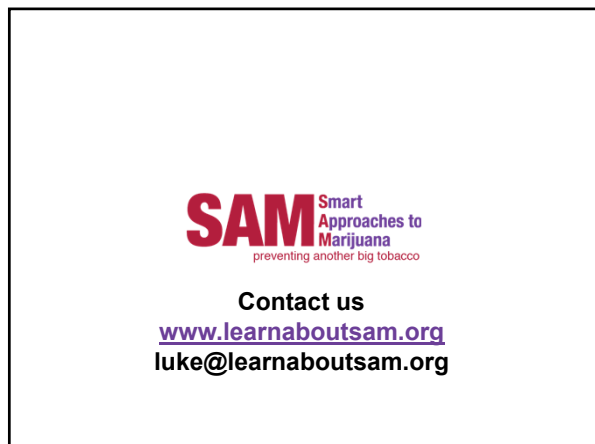
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