



# Practical Theorist 12 – Cannabis, the Current State of Affairs

Research Into Action Webinar Series

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# **Practical Theorist 12:**

## **Cannabis, The Current State of Affairs**

**Supported in Part by the  
National Institute on Drug Abuse (NIDA)  
National Institutes of Health (NIH)  
U.S. Department of Health and Human Services (DHHS)**



# Botanical Information



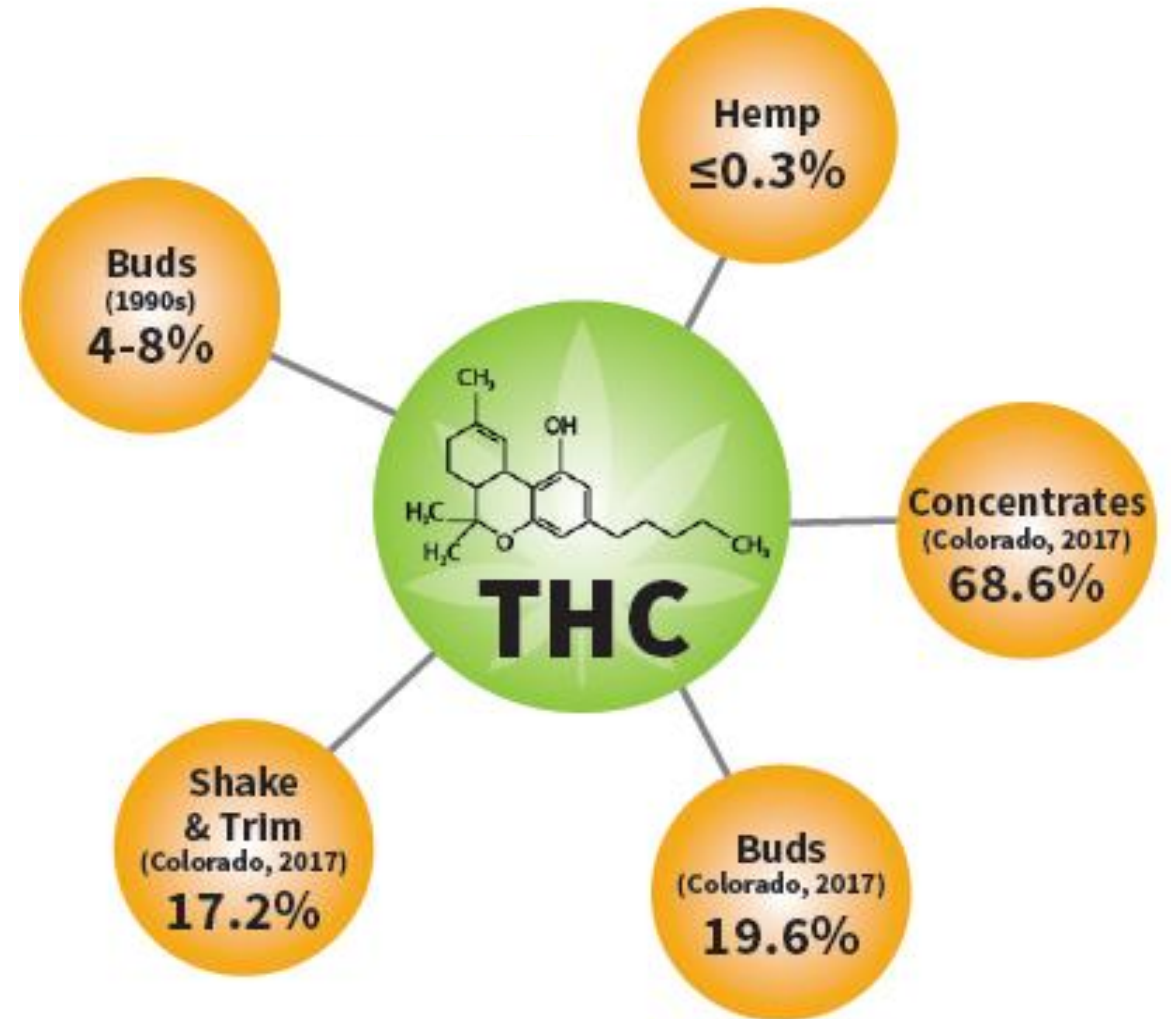
- Most cannabinoids, including THC and CBD, are produced by female flowers before fertilization
- Cannabis plants containing low levels of THC are called hemp (<0.3% THC, according to the 2018 Farm Bill)





# Cannabis Potency

- Over 500 compounds in cannabis including cannabinoids, terpenoids, flavonoids and others
- THC is responsible for most of the psychotropic effects
- Average potency of cannabis seized by DEA increased from 4% THC in 1995 to 17.1% in 2017 (ElSohly et al., 2016; Chandra et al., 2019)



Sources: Al-Zouabi et al., 2018; MPG & CU Boulder, 2018; National Conference of State Legislatures, 2019b.

# Modes of Cannabis Use



## INHALATION



Dab



Blunts



Joints



THC Vaping Cartridge



Hookah



Hand Pipe



Bong/Water Pipe



# Modes of Cannabis Use



## INGESTION



Candy



Cookies



Beer



Coffee



## TOPICAL



Creams and oils



# CBD and Synthetic Cannabis

## CANNABIDIOL

- Compound found in cannabis with no intoxicating or addictive effects
- Insufficient research regarding efficacy as medical treatment
- FDA has not approved use of CBD in medical products, dietary supplements, or food products

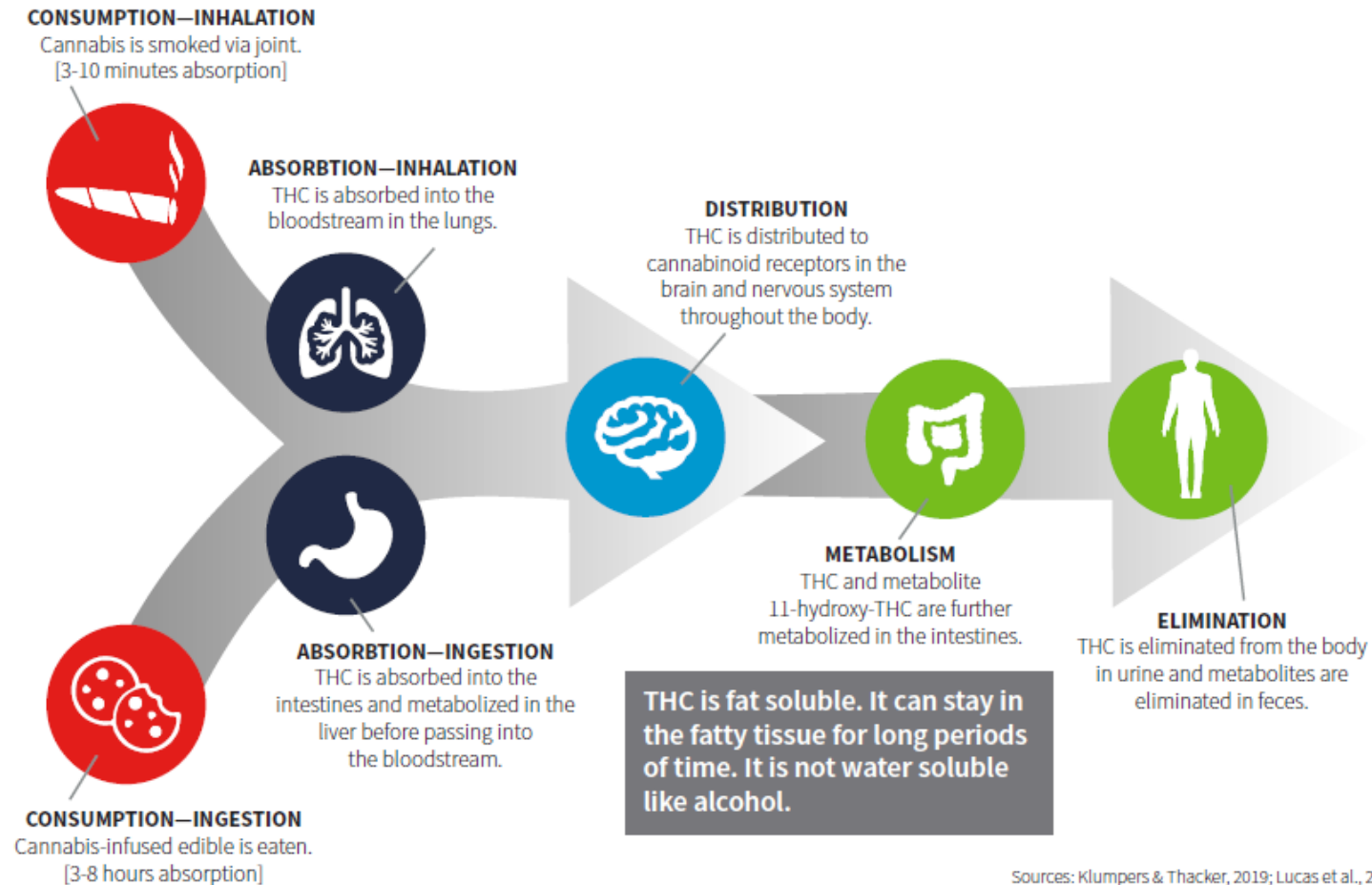
## SYNTHETIC CANNABIS

- Over 165 synthetic cannabinoids identified, such as Spice and K2
- Manufactured as powders that are added to plant material and smoked
- More harmful lung effects and negative effects when high





# How the Human Body Processes Cannabis



Sources: Klumpers & Thacker, 2019; Lucas et al., 2018.





# Acute vs. Chronic Effects

## ACUTE EFFECTS

- Impaired cognitive effects
  - Verbal learning and memory
  - Attention
  - Decision-making
- Incoordination and poor psychomotor performance
- Increased blood pressure and potential for adverse cardiovascular effects
- Overdose unlikely

## CHRONIC EFFECTS

- Increased risk of schizophrenia or psychosis
- Persistent decreased cognitive function associated with long-term use
- Disrupted brain development in adolescence
- Higher risk for bronchitis, poor lung function, or stroke



# FDA-Approved Medications

DRUG NAME	ACTIVE INGREDIENT	INDICATED DISEASE/SYMPTOM
<b>Dronabinol</b>	Synthetic THC	<ul style="list-style-type: none"><li>• Nausea associated with chemotherapy in AIDS patients</li><li>• Pain from multiple sclerosis</li></ul>
<b>Nabilone</b>	Synthetic THC	<ul style="list-style-type: none"><li>• Nausea and vomiting associated with chemotherapy</li></ul>
<b>Nabiximols*</b>	THC, CBD (in equal amounts)	<ul style="list-style-type: none"><li>• Spasticity associated with multiple sclerosis</li><li>• Chronic pain associated with cancer</li></ul>
<b>Epidiolex</b>	CBD	<ul style="list-style-type: none"><li>• Epileptic seizures associated with drug resistant syndromes</li></ul>

\*Nabiximols is currently in the FDA approval process but has been approved for use in the EU.



# Cannabis Use Disorder

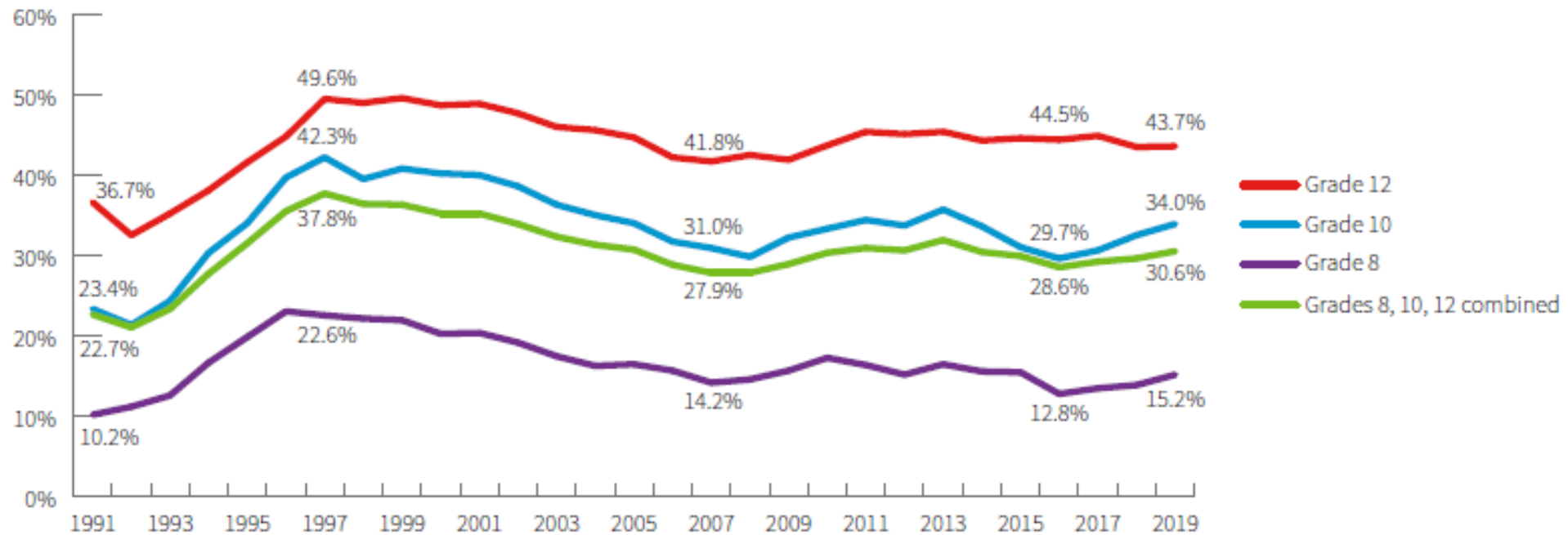
DSM-5: Cannabis use disorder is cannabis use meeting at least 2-3 of 11 criteria, including cravings, tolerance, withdrawal symptoms, difficulty fulfilling work and personal responsibilities, relationship problems, and spending a lot of time getting, using, and recovering from cannabis.

- 4.4 million people aged 12 or older met diagnostic criteria for a past year cannabis use disorder (2018 NSDUH)
- Individuals who initiate cannabis use in adolescence are more likely to develop a cannabis use disorder than those who initiate use as adults (Volkow, Baler, Compton, & Weiss, 2014)



# Youth Cannabis Use

## Lifetime Cannabis Use by Grade



Source: Johnston et al., 2020

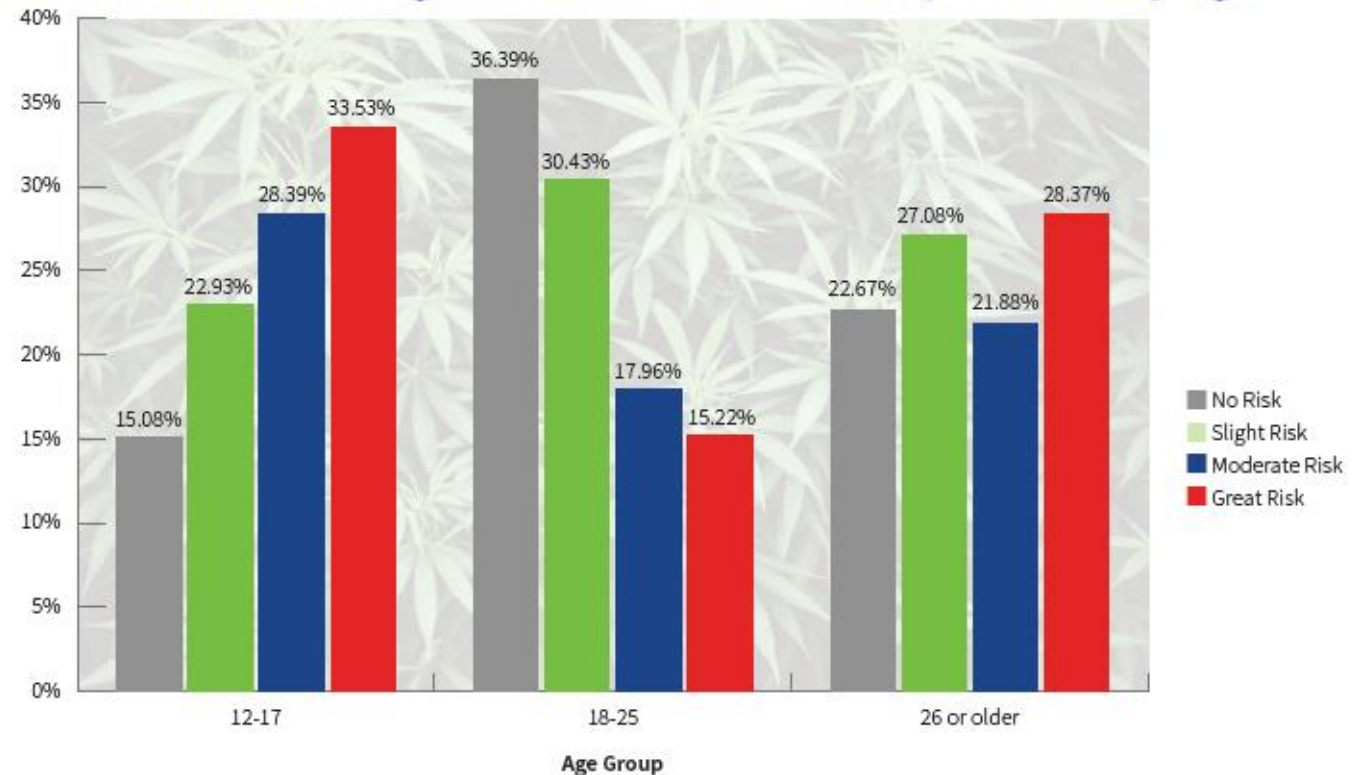




# Youth Cannabis Use

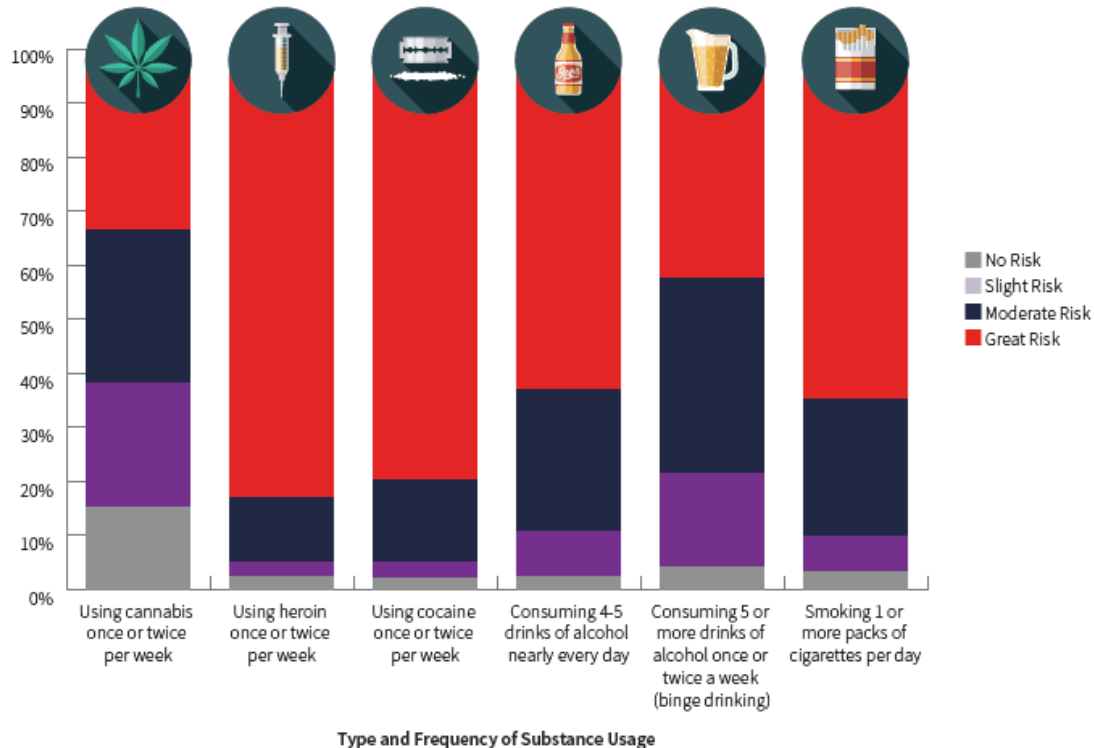
- 34% of youth ages 12-17 perceive a great risk of using cannabis once or twice per week compared to 15% of young adults ages 18-25 (SAMHSA, 2019)
- 94% of youth with lifetime cannabis use who participated in an online survey did not think cannabis was addictive (Knapp et al., 2019)

Perceived risk of using cannabis once or twice per week by age



# Youth Cannabis Use

Perceived risk of regular use of illicit substances by youth ages 12-17



- Almost all youth who have used cannabis reported that they have smoked it
  - Youth do not seem to connect the perceived harms of smoking cigarettes to smoking cannabis (Schneider, Thompson, Brooks-Russell, Johnson, & Thrul, 2019)



# Surgeon General's Advisory on Adolescent Marijuana Use

## Frequent Marijuana Use During Adolescence Is Associated With:

- Changes in the area of the brain involved in attention, memory, decision-making and motivation
  - Deficits in attention and memory have been detected even after a month of abstinence
- Impaired learning in adolescents. Chronic use is linked to declines in IQ, school performance that jeopardizes professional and social achievements and life satisfaction
- Increased rates of school absence and drop-out as well as suicide attempts
- Risk for and early onset of psychiatric disorders, such as schizophrenia



# Cannabis Use and Academic Performance

- Cannabis use during the first year of college was associated with an increased likelihood of skipping classes and declines in GPA.
- Lifetime abstinence from use of alcohol and other drugs among youth was associated with a decreased likelihood of skipping school and an increased likelihood of having average grades of B- or higher.

Sources: Arria, A.M., Caldeira, K.M., Bugbee, B.A., Vincent, K.B., & O'Grady, K.E. (2015). The Academic Consequences of Marijuana Use during College. *Psychology of Addictive Behaviors, 29*(3), 564-575.

Bugbee, B.A., Beck, K.H., Fryer, C.S., & Arria, A.M. (2019). Substance Use, Academic Performance, and Academic Engagement Among High School Seniors. *Journal of School Health, 23*, 2478-2502.





# Increased Use Among College Students

In 2015, 38 percent of college students indicated that they had used marijuana in the prior 12 months, up from 30 percent in 2006

<http://www.monitoringthefuture.org//pressreleases/16collegedrug.pdf>



# Marijuana and College Completion Rates

College students with high levels (17 days/month) of marijuana use were twice as likely as those with minimal use (less than 1 day/month) to have an enrollment gap (e.g. dropout and not graduate on time) while in college.<sup>1</sup>

<sup>1</sup> Amelia M. Arria , MD. Drug Use Patterns and Continuous Enrollment in College: Results From a Longitudinal Study. January 2013 . Vol. 24 Issue 1. Available: [http://www.jsad.com/jsad/article/Drug\\_Use\\_Patterns\\_and\\_Continuous\\_Enrollment\\_in\\_College\\_Results\\_From\\_a\\_Long/4775.html](http://www.jsad.com/jsad/article/Drug_Use_Patterns_and_Continuous_Enrollment_in_College_Results_From_a_Long/4775.html)



# Higher Education Costs



**Average cost of college in 4 years is: \$92,364**

**Average cost of college in 6 years is: \$138,546**

Source: National Center for Education Statistics (2019).  
<https://nces.ed.gov/fastfacts/display.asp?id=76>



# Takeaway Messages for Parents

- Marijuana use will hurt YOUR child's IQ, grades, and ability to graduate from high school !!
- Your child's marijuana use could derail their college career and be very costly to you!!







# Marijuana Use Impairs Driving

A NIDA study found:

Marijuana's active chemical THC affects weaving within a road lane in a similar way to a blood alcohol level of .08, the legal limit in many states

Marilyn Huestis of NIDA

“One of the things we know happens with cannabis is that it reduces your field of vision and you get tunnel vision, so you're unable to react as quickly.”

<http://www.dailymail.co.uk/news/article-3137943/Marijuana-DOES-impair-driving-kind-comprehensive-government-study--reveals-cannabis-use-affect-motor-skills-three-drinks.html>



# ROADSIDE SURVEYS:

	Weekday Days	Weekend Nights
Tested positive for some drug or medication	22.4%	22.5%
Illegal drugs, including marijuana	12.1%	15.2%
Medication	10.3%	7.3%
Marijuana	11.7%	12.6%
Alcohol	1.1%	8.3%

Source: Governors Highway Safety Association, National Roadside Survey, 2014.  
<https://www.stopdruggeddriving.org/problem>



# Marijuana Use Impairs Driving

A study conducted by the National Cannabis Prevention and Information Centre found nearly **70%** of recent cannabis users had driven while under the influence of the drug

**16%** of users said they had driven on a daily basis less than five hours after using

Many users were oblivious to the impact cannabis had on driving skills

<http://www.abc.net.au/news/2015-06-10/cannabis-users-report-driving-under-influence/6534368>



# THC and Car Accidents

- Drummer et al. (2020) found that drivers who tested positive for THC were 2.8 times more likely to be culpable for an accident.
- Drivers who combined THC and alcohol were 21 times more likely to be culpable for an accident.
- Drivers who use THC are less able to control their vehicle and have reduced ability to respond to unexpected situations.



Source: Drummer, O.H., Gerostamoulos, D., Di Rago, M., Woodford, N.W., Morris, C., Frederiksen, T., Jachno, K, Wolfe, R. (2020 February). Odds of culpability associated with use of impairing drugs in injured drivers in Victoria, Australia. *Accident Analysis and Prevention*, Vol. 135. <https://www.sciencedirect.com/science/article/abs/pii/S0001457519312011?via%3Dihub>

# Marijuana Use Impairs Driving

- Chronic cannabis users have poorer cognitive performance even when they are not currently intoxicated.
  - Possible residual cognitive impairment with heavy cannabis use
- Chronic, heavy recreational cannabis use is associated with worse driving performance in non-intoxicated drivers.



Source: Dahlgren, M.K, Sagar, K.A., Smith, R.T., Lambros, A.M., Kuppe, M.K., and Gruber, S.A. (2020 January 14). Recreational cannabis use impairs driving performance in the absence of acute intoxication. *Drug and Alcohol Dependence*.

<https://www.sciencedirect.com/science/article/pii/S0376871619305484>





# CADCA's Seven Strategies for Community Change

STRATEGY	EXAMPLE
Provide Information	<ul style="list-style-type: none"><li>• Social media messaging</li><li>• Student leaders raising awareness</li></ul>
Build Skills	<ul style="list-style-type: none"><li>• Provide students training on how to use peer refusal skills</li><li>• Provide teachers training on recognizing signs of cannabis use</li></ul>
Provide Support	<ul style="list-style-type: none"><li>• Collaborate with schools, parents and youth on student-led initiatives</li></ul>
Change Access and Barriers	<ul style="list-style-type: none"><li>• Collaborate with schools to have school resource officers monitor common access areas such as halls, bathrooms, and parking lots</li></ul>
Change Consequences/Incentives	<ul style="list-style-type: none"><li>• Highlight students who choose not to use cannabis</li></ul>
Physical Design	<ul style="list-style-type: none"><li>• Restrict sale and display of cannabis paraphernalia (e.g., rolling papers, pipes)</li></ul>
Modify/Change Policies	<ul style="list-style-type: none"><li>• Support local ordinance to restrict hours or days of sale</li><li>• Update clean air laws to include cannabis</li></ul>



# Are Lessons from Tobacco Control Being Incorporated into City and County Laws Regulating Legal Marijuana in California?

A cross-sectional study of 539 CA cities and counties found that key public health recommendations and lessons learned from tobacco control to reduce demand and prevent youth marijuana use have generally NOT BEEN ADOPTED!



# Marijuana Is Not Being Regulated Based on Lessons Learned From Tobacco Control in California

**49% of California jurisdictions, covering 57% of the state population allowed retail sale of marijuana**

1. No jurisdiction required warnings on advertising
2. No jurisdiction limited potency of products sold
3. Only 1 jurisdiction prohibited the sale of flavored products
4. Only 5 jurisdictions prohibited discounting
5. Only 8 jurisdictions imposed restrictions on products that exceeded state regulations
6. 27 jurisdictions allowed onsite consumption
7. 53% of jurisdictions did not tax it locally
8. 81 jurisdictions allow sales by delivery only

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