

Aaron Weiner, PhD, ABPP

April 8, 2022

Members of the Aging and Youth Committee,

I submit this written testimony today in support of my presentation regarding the impact of marijuana legalization and commercialization on youth in Pennsylvania. I am a Licensed Clinical Psychologist, an addictions specialist, public speaker, and a small business owner based outside Chicago, Illinois. Prior to starting my own business, I was the director of the Addiction Service line at a hospital group in the West suburbs of Chicago, overseeing 4 outpatient addictions clinics and one inpatient medical detoxification unit. My profession and experience in Illinois have afforded me a strong vantage point on the issue of marijuana use, public health, and the costs to youth associated with promoting general consumption of marijuana and THC products. Please include this letter as part of the official public hearing record.

I had very serious concerns related to commercializing marijuana in Illinois, and voiced as much when it was being debated in 2019. My opposition to the bill ran counter to my own financial interests – the more exposure the population has to marijuana the more people who will become addicted (10% of adult users, 17% of adolescent users, and 30% of daily users according to the CDC), and thus the more revenue my clinics would generate in rehabilitating those individuals. Even now, as I continue to treat individuals for addiction across the country using expansions in telehealth laws, I strongly oppose legislation that generates new addiction-for-profit industries, and submit this testimony in support of my moral and ethical duty to protect the public. I believe our elected officials likely hold a similar code of ethics regarding public health and safety, and as such, when given accurate information will act in ways consistent with promoting the safety and health of the citizens of Pennsylvania.

Today's hearing is focused on the implications on youth of commercializing marijuana. These implications are numerous and concerning (as outlined below), and this possible policy change is also coming at the worst possible time: we are in the middle of a national emergency regarding youth mental health, with the CDC recently releasing a report finding that 40% of high-school students endorsed depression and 20% contemplated suicide over the past year. This mental health crisis will only enhance the allure of intoxicating substances to provide relief, and increasing the availability and acceptability of these intoxicating substances (marijuana or otherwise) will only add fuel to the proverbial fire.

On the topic of youth health and wellbeing, I submit the following points for your consideration. If what you read below contradicts other information you have heard on this subject, I implore you to contact me so that I can share my primary source data with you. Please also refer to the slides submitted along with this written testimony for further detail. As there is a significant amount of health misinformation present around the issue of marijuana, proper analysis of data is crucial in your decision. My contact information can be found at the conclusion of this testimony.



Aaron Weiner, PhD, ABPP

1. Legalizing marijuana has a strong chance of increasing adolescent use rates, and almost certainly will increase use rates for young adults between 18-21.

While the data on the 13-17 year-old use rates at this point are mixed, several studies referenced in the submitted slides have found that youth rates have increased or changed trajectory after legalization, including in California and Alaska. The data is very clear that use rates will increase in the young adult demographic. We also know that the marijuana industry works hard to lower perceived risk of its product, including through advertising in ways that directly appeal to youth. Increased availability and decreased perception of harm are the primary ingredients for increases in usage rates.

2. Local data analyses show that use rates increase the closer adolescents and young adults are to a dispensary.

The data on local impact has only begun to emerge in the past year or two, but points towards a clear pattern of dispensaries directly affecting the behavior of those who live closest to them. In particular, distance to a dispensary (and exposure to marijuana advertising) has been linked to increases in adolescent use rates, young adult use rates, and use rates in pregnant women. It also is directly linked to cannabis-related emergency-room visits in the surrounding area.

3. Today's high-potency marijuana and THC products are actively harmful for the developing mind and are linked to numerous negative health consequences, including addiction and psychosis.

Marijuana has significant impacts on the brain prior to reaching full maturation, which does not occur until about 25 years of age. THC has been linked to structural brain changes, reduced IQ, lower achievement in school, decreased lifetime earning potential, and a host of other cognitive concerns. THC use in adolescents has also been linked to increased debt, delinquency, other substance use, unemployment, and lower general well-being and functioning. THC products have been repeatedly shown to be chemically/physically addictive have also been strongly linked to the development of psychotic symptoms that are permanent in many cases. A recent journal article examining national hospital discharge records found 129,000 discharges due to cannabinoid-induced psychosis in 2017 – an average of one case every 4 minutes – and that these cases were higher in states that had commercialized marijuana. The fewer young people who use these product, the better off the youth of our country will be.

4. Marijuana use is strongly linked to the development of other drug use.



Aaron Weiner, PhD, ABPP

Multiple recent studies have shown a clear relationship between the use of marijuana and THC products leading to an increased probability of developing an addiction to another drug (e.g., opioids) in following years, and correlational data has shown for years that the vast majority of people who use "harder" drugs (such as heroin) use marijuana first. This relationship exists because virtually no heroin user begins their drug journey by using heroin – the perceived risk of doing so is too high, and the idea of "hard" drug use is so far from their own sense of identity that it is not seen as a viable option. Marijuana often serves as a bridge, creating a identity for a teenager in which they now see themselves as someone who gets high for fun, breaks the law when it suits them (use generally remains illegal under 21), and identifies with a peer group and social culture in which drug use is normalized. These factors make the chances that they will encounter other drugs far more likely, as well as increases the chance that they'll follow their friends' lead and use these drugs. This opens the pathway to a progression of addiction, which can eventually lead an individual to use "hard" drugs such as methamphetamine or heroin. THC serves to open this possible path – without THC to induct them into a drug-using identity, the vast majority of youth will never use these other substances.

Commercializing marijuana is an overwhelmingly negative policy change for youth drug use rates. In general, effective drug policy discourages drug use – commercializing marijuana does exactly the opposite, creating an industry that is financially incentivized to addict as many new users as possible. I hope that you will take these points under consideration, and think critically about the realistic costs of this policy change as you make your decision.

Sincerely,

Aaron Weiner, PhD, ABPP

aw his N

Licensed Clinical Psychologist Owner, Bridge Forward Group

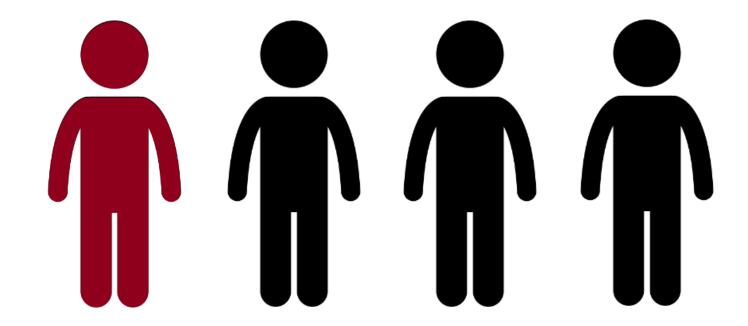
E-Mail: aaron@weinerphd.com

Phone: 847-786-8725

Website: http://www.weinerphd.com

Impact of Marijuana Legalization and Commercialization on Youth

Youth Use Impact



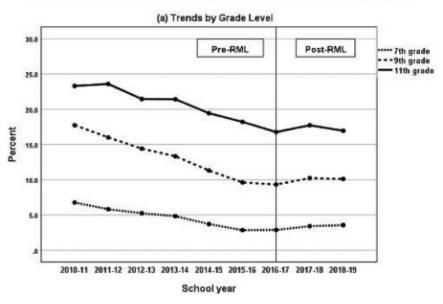
One in four 12th graders indicated they would try marijuana, or increase their current use more, **if it were legalized** (Monitoring the Future, 2021)

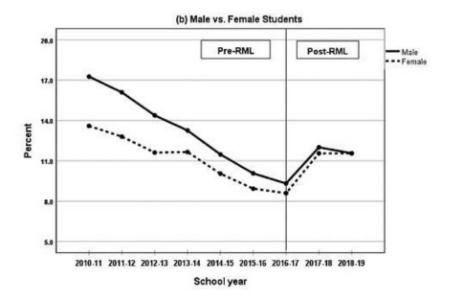
Recreational Marijuana Legalization and Use Among California Adolescents: Findings From a Statewide Survey

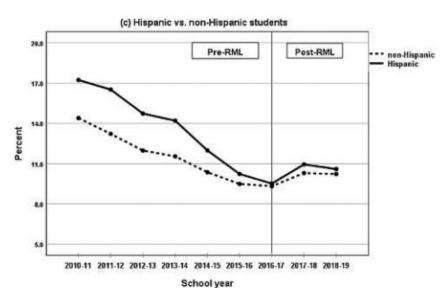


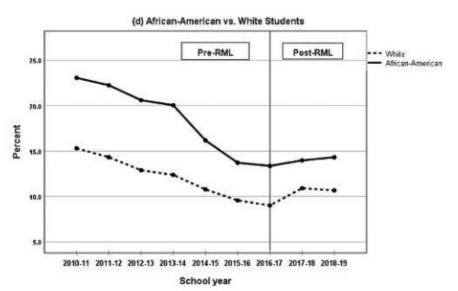
MALLIE J. PASCHALL, Ph.D., a,* GRISEL GARCÍA-RAMÍREZ, Ph.D., a & JOEL W. GRUBE, Ph.D. a

^aPrevention Research Center, Pacific Institute for Research and Evaluation, Berkeley, California



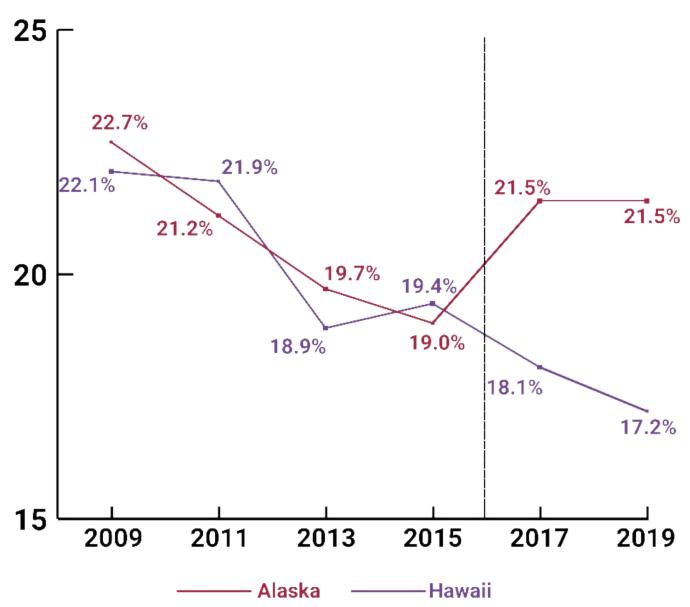




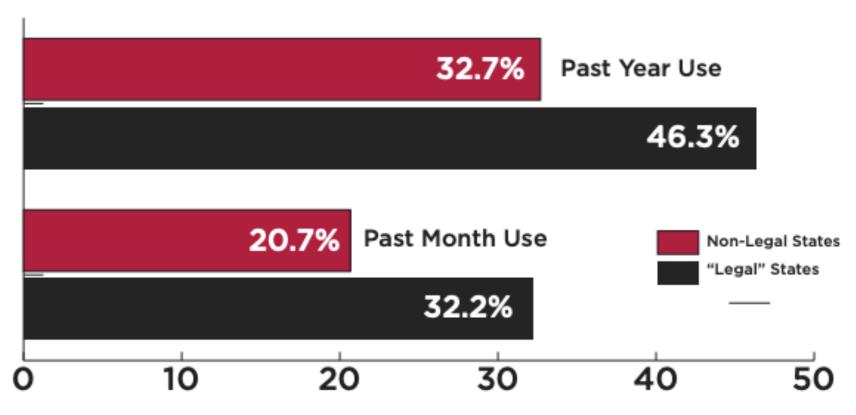


Adolescents' Marijuana Use Following Recreational Marijuana Legalization in Alaska and Hawaii

Meen Hye Lee, PhD, RN¹, Yeoun Soo Kim-Godwin, PhD, MPH, CNE, RN¹, and Hyungjo Hur, PhD²



PAST YEAR AND PAST MONTH YOUNG ADULT (18-25 YR OLD) USE IN "LEGAL" STATES OUTPACES SUCH USE IN NON-LEGAL STATES.



(NSDUH STATE COMPARISONS, 2019)

So, why does this matter?



Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep





Frequent teenage cannabis use: Prevalence across adolescence and associations with young adult psychopathology and functional well-being in an urban cohort

Lilly Shanahan ^{a, b, *}, Annekatrin Steinhoff ^a, Laura Bechtiger ^a, William E. Copeland ^c, Denis Ribeaud ^a, Manuel Eisner ^{a, d}, Boris B. Quednow ^{e, f}

Table 3b

Adjusted associations of teenage cannabis use and young adult psychopathology and functional outcomes. Rows represent outcomes, columns represent predictor variables (i.e., the frequency of cannabis use).

Outcomes	Frequent vs no use			Frequent vs occasional use			Occasional vs no use		
	β^a/OR^b	CIc	P	β ^a /OR ^b	CIc	P	β^a/OR^b	CIc	P
Psychopathology Outcomes									
Psychosis symptoms ^a	0.08	0.00-0.16	0.040	0.08	0.02-0.15	0.012	0.00	-0.080.08	0.996
Problematic substance use ^b	10.13	5.96-17.22	< 0.001	3.87	2.47—6.07	< 0.001	2.61	1.81-3.79	< 0.001
Physical aggression ^b	1.47	0.88-2.48	0.145	1.41	0.92 - 2.18	0.116	1.04	0.70-1.55	0.844
Internalizing symptoms ^a	0.05	-0.020.12	0.192	0.07	0.01-0.13	0.019	-0.03	-0.100.04	0.417
Functional outcomes									
Delinquency ^a	0.20	0.12-0.27	< 0.001	0.14	0.07-0.22	< 0.001	0.07	0.00-0.13	0.038
Debt ^b	1.74	1.03-2.95	0.039	1.78	1.17-2.71	0.006	0.98	0.64 - 1.48	0.910
General well-being ^a	-0.10	-0.18— -0.03	0.008	-0.13	-0.20— -0.06	< 0.001	0.03	-0.040.10	0.382
Perceived social exclusion ^a	0.09	0.01-0.16	0.026	0.10	0.04-0.16	0.001	-0.02	-0.100.06	0.614
Not in education, employment ^b	6.71	2.00-23.06	0.002	3.40	1.42-8.12	0.004	1.98	0.61-6.44	0.259

Note. p-value refers to unstandardized logit coefficient in the case of logistic regressions. Multivariable models adjusted for the outcome at a previous time point when possible (typically at age 11), and also for all covariates shown in Table 1. Bolded values are significant at p < .0055.

 $^{^{\}rm a}\,$ standardized linear regression coefficient β for linear regressions

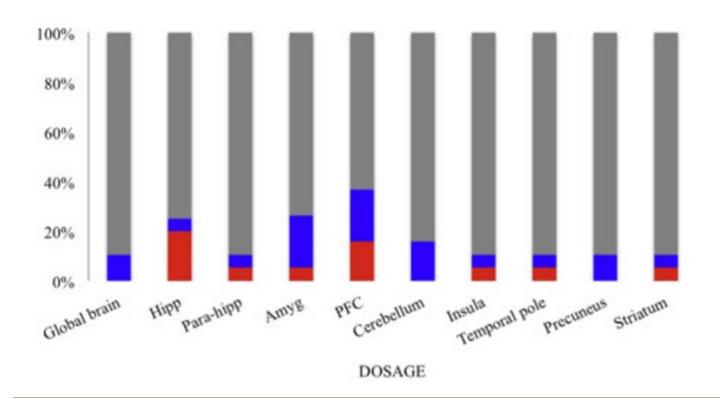
b odds ratios for logistic regressions

c 95% confidence interval

Altered Brain Development

The Role of Cannabinoids in Neuroanatomic Alterations in Cannabis Users

Valentina Lorenzetti, Nadia Solowij, and Murat Yücel



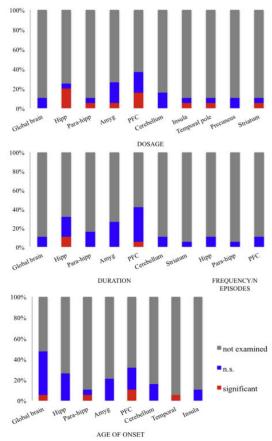
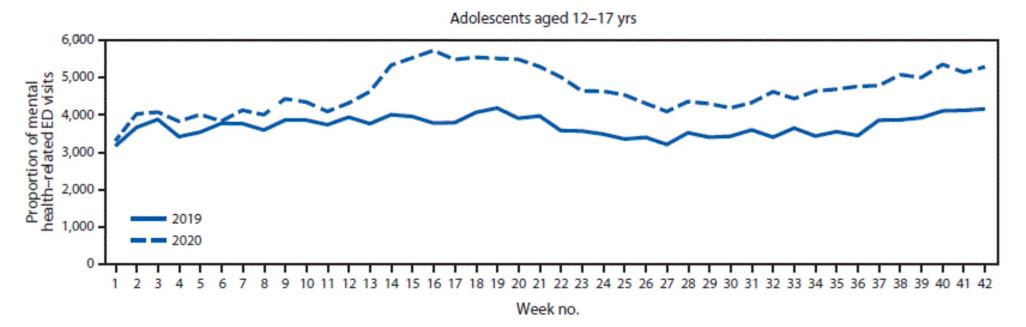


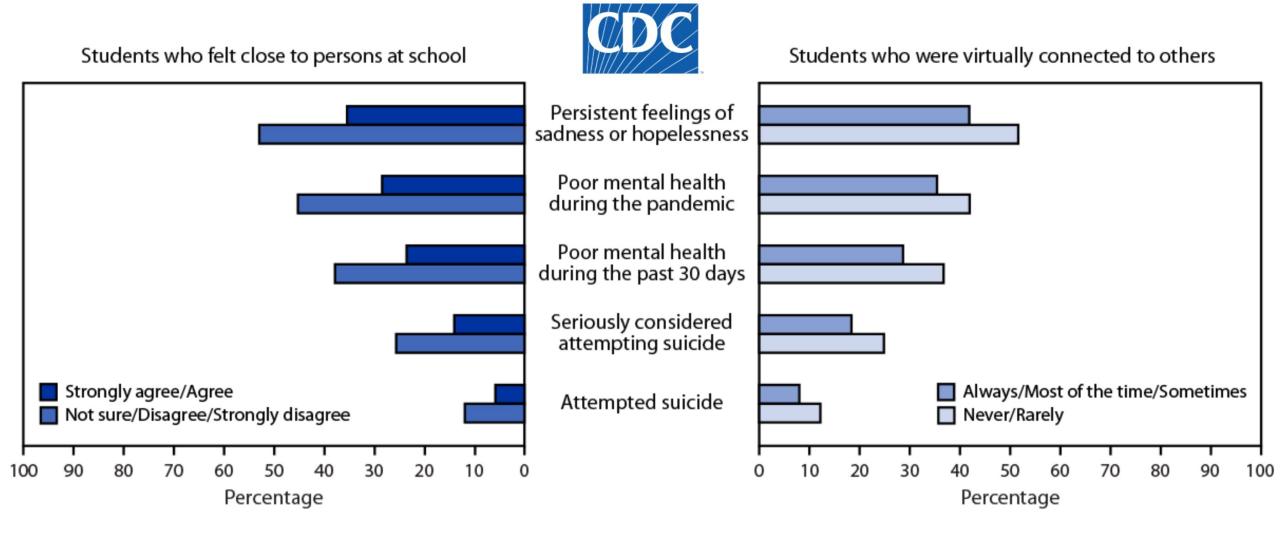
Figure 4. Percentage of studies reporting associations between regional neuroanatomy and cannabis use measures. Significant associations (red), nonsignificant associations (n.s.; blue), and associations unexamined (gray). Amyg, amygdala; Hipp, hippocampus; Para-hipp, parahippocampal gyrus; PFC, prefrontal cortex.

Pediatricians, Child and Adolescent Psychiatrists and Children's Hospitals Declare National Emergency in Children's Mental Health

AACAP, AAP, and CHA call on policymakers at all levels of government to act swiftly to address mental health crisis

Washington, D.C., October 19, 2021 – Today, the American Academy of Pediatrics (AAP), the American Academy of Child and Adolescent Psychiatry (AACAP) and the Children's Hospital Association (CHA) together representing more than 77,000 physician members and more than 200 children's hospitals, **declared** a national state of emergency in child and adolescent mental health and are calling on policymakers to join them.





- 44% experienced "persistent feelings of sadness or hopelessness"
- 20% seriously considered attempting suicide

THC + Mood Disorders

JAMA Pediatrics | Original Investigation

Association of Cannabis Use With Self-harm and Mortality Risk Among Youths With Mood Disorders

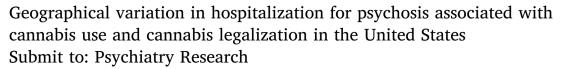
Cynthia A. Fontanella, PhD; Danielle L. Steelesmith, PhD; Guy Brock, PhD; Jeffrey A. Bridge, PhD; John V. Campo, MD; Mary A. Fristad, PhD

- 3x higher risk of self-harm
- All-cause mortality increase of 59%
- Unintentional overdose 2.5x higher
- Homicide rates 3x higher

Other Risks of Adolescent THC Use

- Cannabinoid Hyperemesis Syndrome (CHS)
- Psychotic breaks

Full-length article





Lauren V. Moran a,b,c,*, Erica S. Tsang b,d, Dost Ongur a,c, John Hsu e,f,g, May Y. Choi b,h

In 2017, there were an estimated 129,070 hospital discharges for psychosis associated with cannabis

Keywords: Cannabis Marijuana Legalization Psychosis Schizophrenia The 2017 National Inpatient Sample database was utilized to investigate the association between cannabis legalization in the United States and hospitalizations for psychosis associated with cannabis use. We compared the odds of hospital discharges for psychosis associated with cannabis use in adults between the Pacific census division (where most states legalized recreational cannabis use) and other divisions using multivariable logistic regression, adjusting for confounders. We calculated a score for each census division representing cannabis legality as the population-weighted sum of state scores: 1=illegal or cannabidiol/low potency cannabis; 2= medical marijuana; and 3=recreational and medical marijuana legalized. Pearson's correlation coefficients (r) quantified the relationship between scores and the proportion of hospitalizations with psychosis associated with cannabis. In 2017, there were an estimated 129,070 hospital discharges for psychosis associated with cannabis use. The Pacific census division had significantly higher odds of discharges than other divisions (adjusted odds ratio 1.55; 95% confidence interval 1.25 - 1.93). There was a significant correlation between the cannabis legality score and proportion of hospital discharges for psychosis associated with cannabis use (r = 0.67, p < 0.05). In conclusion, we observed a higher proportion of hospital discharges for psychosis associated with cannabis use in areas with more liberal cannabis legalization laws.

^a Division of Psychotic Disorders, McLean Hospital, Belmont, MA

b Harvard T.H. Chan School of Public Health, Boston MA

^c Department of Psychiatry, Harvard Medical School, Boston, MA

^d Division of Medical Oncology, BC Cancer and University of British Columbia, Vancouver, British Columbia, Canada

^e Mongan Institute, Massachusetts General Hospital, Boston, MA

f Department of Medicine, Harvard Medical School, Boston, MA

⁸ Department of Health Care Policy, Harvard Medical School, Boston, MA

h Division of Rheumatology, Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada

Accidental Poisonings

Ios Angeles Times

More California kids are having pot-related health scares,

poison control officials warn

Child cannabis-exposure calls to Illinois Poison Center have increased 243% since 2019

The New Hork Times

More Young Kids Are Getting Sick From Cannabis Edibles

As states legalize cannabis, a growing number of children are inadvertently consuming marijuana-infused foods.

by Jakob Emerson | Thursday, January 20th 2022

Pediatrics > General Pediatrics

Kids' ED Visits for Cannabis Exposure Surged After Legalization in Canada

— Increase seen in Ontario study follows similar patterns reported in U.S. states

by Lei Lei Wu, Intern, MedPage Today January 7, 2022

Public Health and Hospitalizations

The impacts of marijuana dispensary density and neighborhood ecology on marijuana abuse and dependence

Christina Mair^{a,b,*}, Bridget Freisthler^{b,c}, William R. Ponicki^b, Andrew Gaidus^b

Results: An additional one dispensary per square mile in a ZIP code was cross-sectionally associated with a 6.8% increase in the number of marijuana hospitalizations (95% credible interval 1.033, 1.105) with a marijuana abuse/dependence code. Other local characteristics, such as the median household income and age and racial/ethnic distributions, were associated with marijuana hospitalizations in cross-sectional and panel analyses.

Conclusions: Prevention and intervention programs for marijuana abuse and dependence may be particularly essential in areas of concentrated disadvantage. Policy makers may want to consider regulations that limit the density of dispensaries.

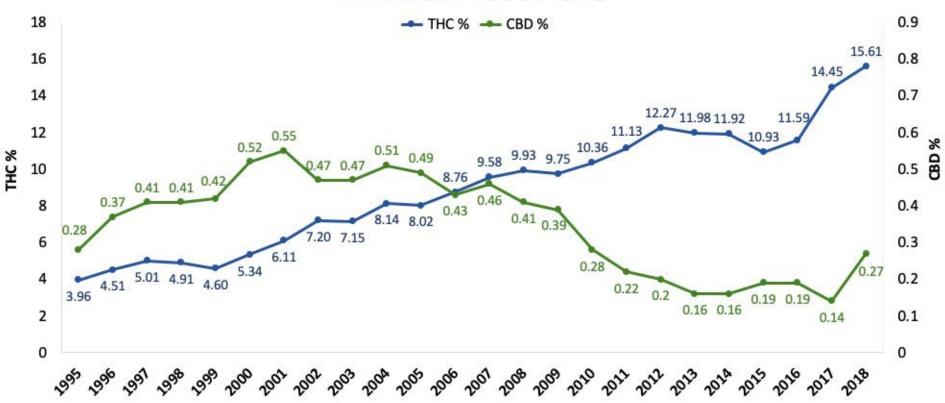
^a University of Pittsburgh Graduate School of Public Health, Department of Behavioral and Community Health Sciences, 219 Parran Hall, 130 DeSoto Street, Pittsburgh, PA, 15261, USA

^b Prevention Research Center, 180 Grand Ave., Ste. 1200, Oakland, CA, 94612, USA

^c UCLA Luskin School of Public Affairs, Department of Social Welfare, 3250 Public Affairs Building, Box 951656, Los Angeles, CA, 90095, USA

More THC, More Consequences

Percentage of THC and CBD in Cannabis Samples Seized by the DEA from 1995-2018



15

Fig 3. Proportion of products with different levels of THC per state.

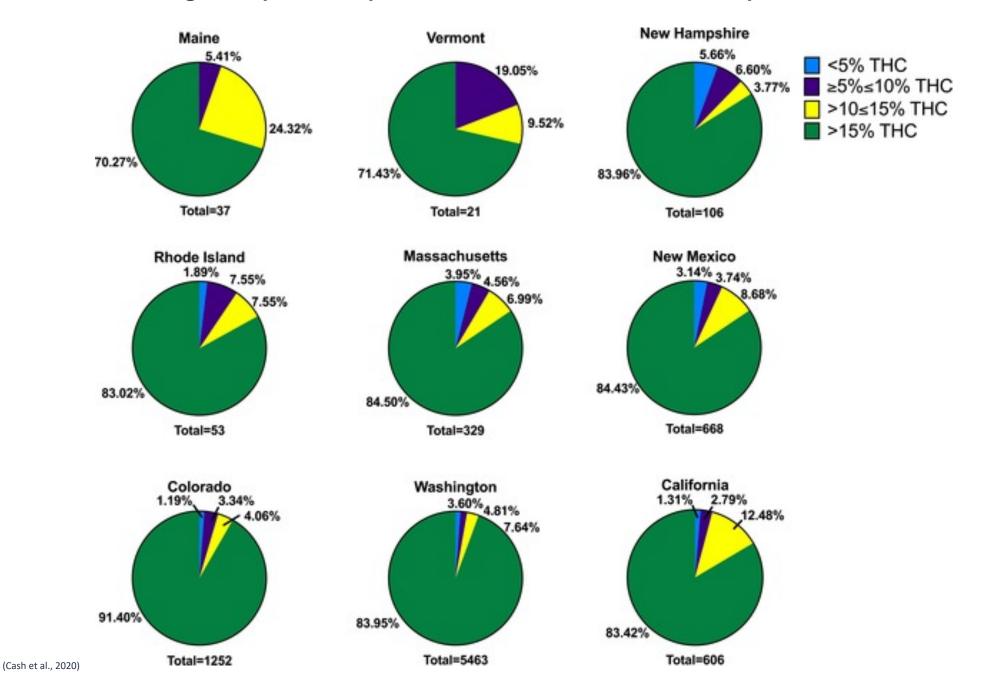


Fig 3. Proportion of products with different levels of THC per state

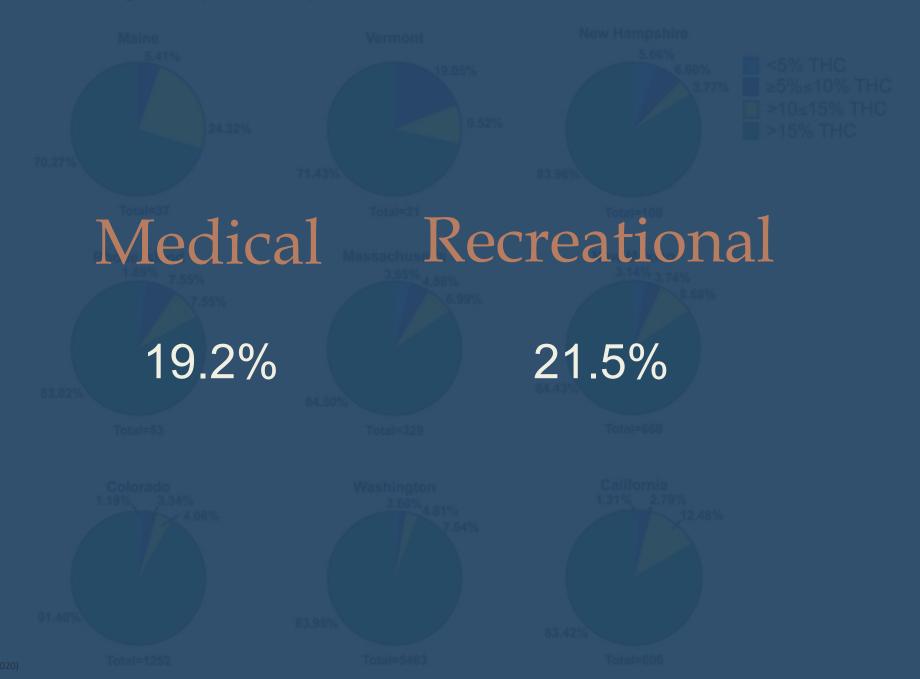
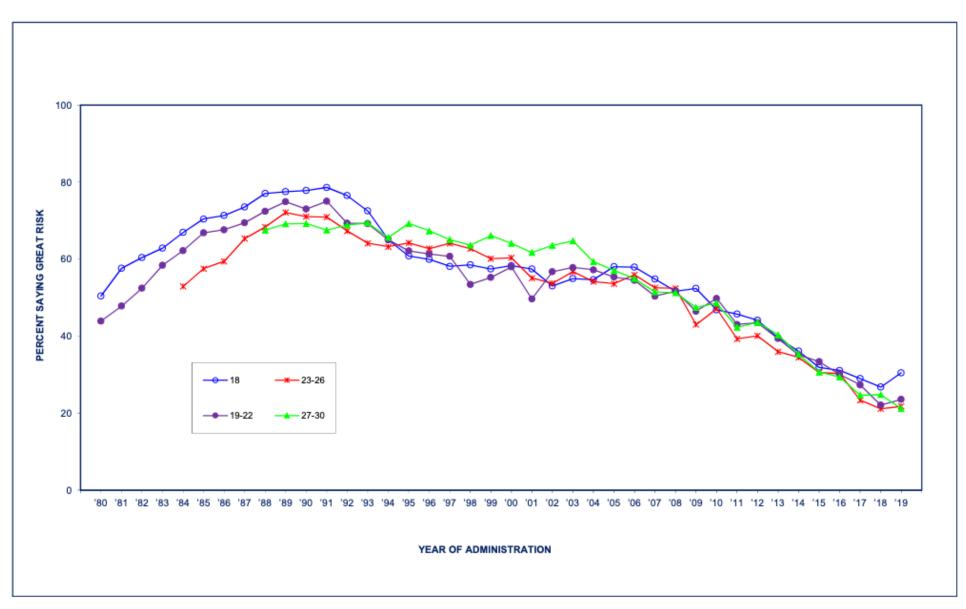
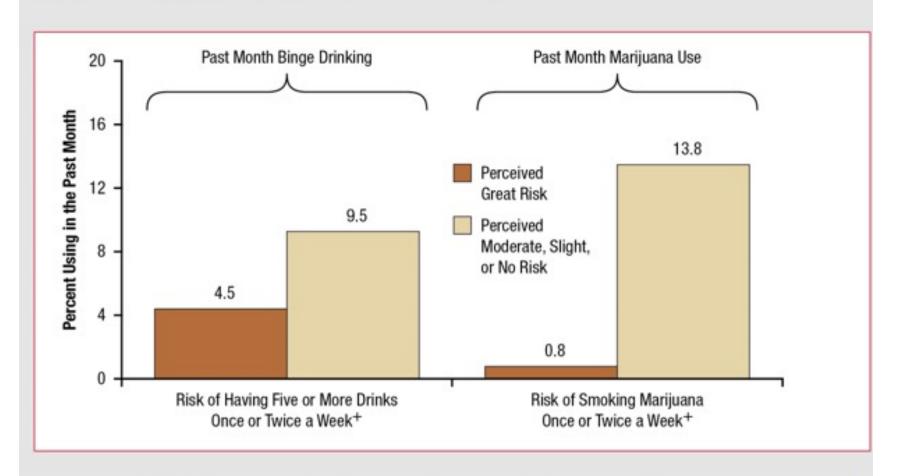


FIGURE 6-3
Trends in Harmfulness of MARIJUANA Use as Perceived by
Respondents in Modal Age Groups of 18, 19–22, 23–26, and 27–30
Regular Use



Source. The Monitoring the Future study, the University of Michigan.

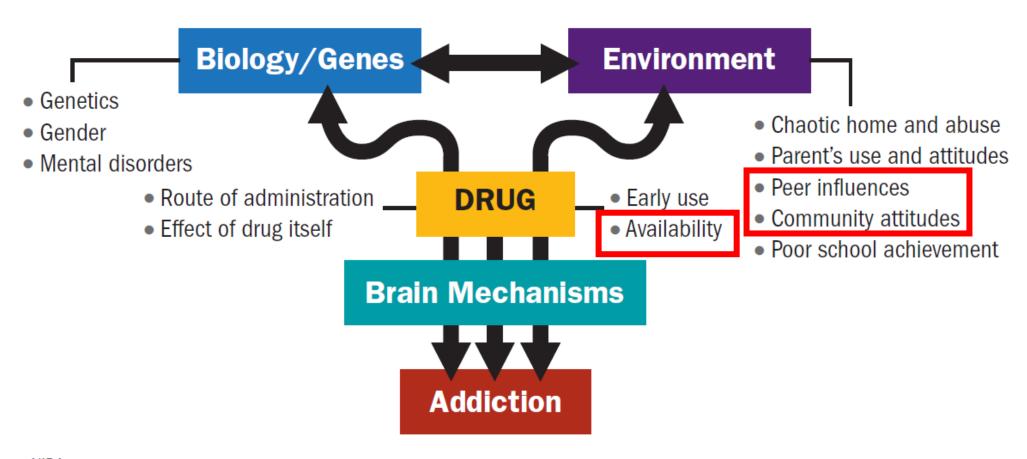
Figure 2. Past Month Binge Drinking and Marijuana Use among Adolescents Aged 12 to 17, by Perceptions of Risk: 2011



Difference between those perceiving great risk and those perceiving moderate, slight, or no risk is statistically significant at the .05 level.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs), 2002 to 2011 (revised March 2012).

Youth Messaging – It Matters



Source: NIDA

Journal of Alcoholand Drugs Studies on Alcoholand Drugs

Despite restrictions, recreational cannabis companies use marketing that appeals to adolescents

A Content Analysis of Cannabis Company Adherence to Marketing Requirements in Four States

Journal of Studies on Alcohol and Drugs, 83(1), 27-36 (2022).

Article Tools

Megan A. Moreno , M.D., M.S.Ed., M.P.H., ^{a,*} Marina Jenkins , B.A., ^a Kole Binger , B.S., ^a Lauren Kelly , M.S.W., ^a Pamela J. Trangenstein , Ph.D., ^b Show All...













Marijuana – Flavors, Edibles, & Marketing









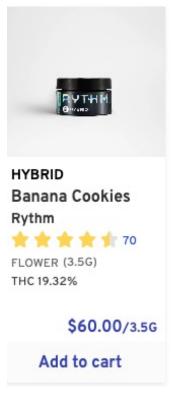
SOUR GUMMIES

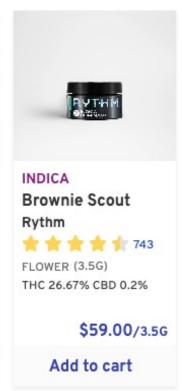
Marijuana - Flavors, Edibles, & Marketing

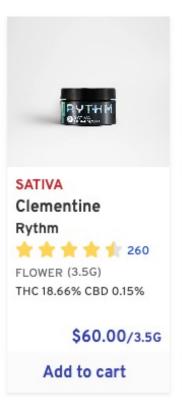
FLOWER

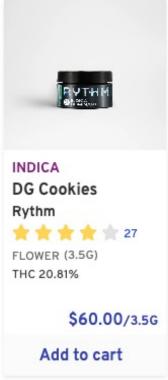


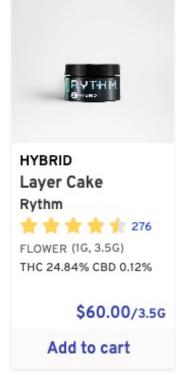
62 Items | See All

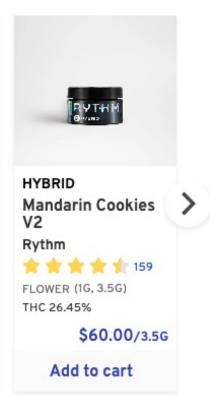










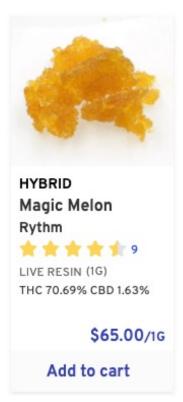


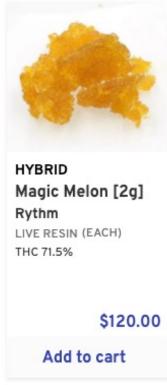
Marijuana – Flavors, Edibles, & Marketing

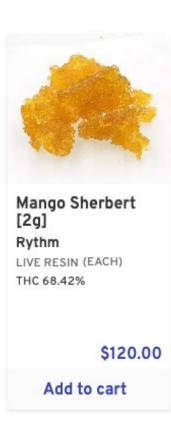
EXTRACT

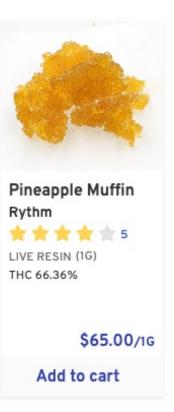


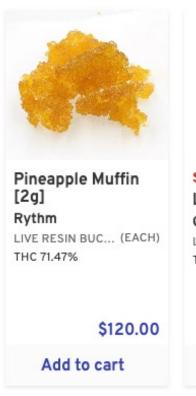
21 Items | See All

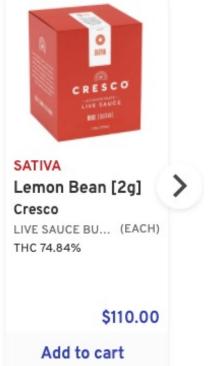












Current US Marijuana Users by Age



(Statista, 2020)

Youth Use Impact

ADDICTION

SSA SOCIETY FOR THIS STUDY OF ADDICTION

RESEARCH REPORT

doi:10.1111/add.14711

Associations between young adult marijuana outcomes and availability of medical marijuana dispensaries and storefront signage

Regina A. Shih , Anthony Rodriguez, Layla Parast , Eric R. Pedersen , Joan S. Tucker , Wendy M. Troxel, Lisa Kraus, Jordan P. Davis & Elizabeth J. D'Amico

RAND Corporation, Santa Monica, CA, USA

 $(\beta = -0.005; 95\% \text{ CI} = -0.009, -0.001; P = 0.03)$. **Conclusions** For young adults in Los Angeles County, living near more medical marijuana dispensaries (MMDs) is positively associated with more frequent use of marijuana within the past month and greater expectations of marijuana's positive benefits. MMDs with signage show stronger associations with number of times used each day and positive expectancies.

Youth's Proximity to Marijuana Retailers and Advertisements: Factors Associated with Washington State Adolescents' Intentions to Use Marijuana

STACEY J.T. HUST (0), JESSICA FITTS WILLOUGHBY (0), JIAYU LI, and LETICIA COUTO

Edward R. Murrow College of Communication, Washington State University, Pullman, Washington, USA

The current study explored the influences of advertising exposure, numbers of marijuana retailers, distance to retailers, and constructs from the integrative model of behavioral prediction, including outcome beliefs, perceived norms, and efficacy, on youth's intentions to use marijuana in a state in which the use of recreational marijuana is legal. A state-wide online cross-sectional survey of 350 adolescents ages 13–17, residing in Washington state, was conducted in June 2018. The results of the regression analysis suggest that exposure to marijuana advertising, positive and negative outcome beliefs, and perceived peer norms were associated with intention to use marijuana. Distances to retailers moderated the relationships between exposure to advertising and intentions, as well as between positive outcome beliefs and intentions. States that have legalized recreational marijuana should continue considering the location of retailers in relation to neighborhoods and advertising regulations to reduce the appeal to youth. Additionally, prevention efforts could aim to influence outcome beliefs and norms in an attempt to reduce adolescents' intentions to use recreational marijuana.

THE AMERICAN JOURNAL ON ADDICTIONS



Examining Associations Between Licensed and Unlicensed Outlet Density and Cannabis Outcomes From Preopening to Postopening of Recreational Cannabis Outlets

Eric R. Pedersen, PhD , ^{1,2} Caislin L. Firth, PhD , ² Anthony Rodriguez, PhD , ³ Regina A. Shih, PhD , ⁴ Rachana Seelam, MPH, ² Lisa Kraus, MS , ² Michael S. Dunbar, PhD , ⁵ Joan S. Tucker, PhD , ² Beau Kilmer, PhD , ² Elizabeth J. D'Amico, PhD , ²

Conclusion and Scientific Significance: This study expands beyond studies of outlet prevalence to find that, after controlling for outcomes 1 year prior, licensed and unlicensed outlets were associated with young adults' cannabis outcomes. The current study is among the first to find associations between cannabis use outcomes and density of cannabis outlets among young adults using data from two time points: preopening and postopening of recreational cannabis retailers. Findings can inform policies around the density and placement of cannabis outlets. (Am J Addict 2020;00:00–00)

4-mile impact radius

- Greater likelihood of use
- Heavier use
- Stronger intentions to use
- More problematic use

Geographical access to recreational marijuana

Christopher A. Ambrose, Ph.D. Candidate¹ | Benjamin W. Cowan, Associate Professor² Robert E. Rosenman, Professor Emeritus¹

School of Economic Sciences,
 Washington State University, Pullman,
 Washington, 99164-6210
 School of Economic Sciences,
 Washington State University and NBER,
 Pullman, Washington, 99164-6210

Correspondence

Christopher A. Ambrose, School of Economic Sciences, Washington State University, Pullman, WA 99164-6210, USA.

Email: christopher.ambrose@wsu.edu

Funding information

National Institute on Drug Abuse, Grant/ Award Number: 1R01DA039293

Abstract

We investigate whether adult marijuana use in Washington responds to increased local access as measured by drive time to the nearest legal marijuana retailer as well as measures of retail density. Using survey data from the Behavioral Risk Factor Surveillance System, we find that as retailers open closer to where they live, more individuals use marijuana and more frequently. These effects are concentrated among young adults (ages 18–26), women, and rural residents. Controlling for distance to the nearest retailer, we find that whether retail density affects marijuana use depends on how it is measured.

KEYWORDS

accessibility, cannabis use, recreational marijuana legalization

JEL CLASSIFICATION

I12; I18; I10

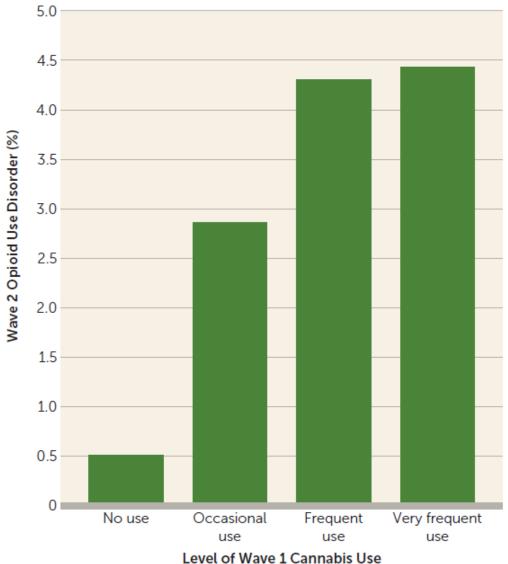
Research Letter | Substance Use and Addiction

Association of Cannabis Retailer Proximity and Density With Cannabis Use Among Pregnant Women in Northern California After Legalization of Cannabis for Recreational Use

Kelly C. Young-Wolff, PhD, MPH; Sara R. Adams, MPH; Alisa Padon, PhD; Lynn D. Silver, MD, MPH; Stacey E. Alexeeff, PhD; Stephen K. Van Den Eeden, PhD; Lyndsay A. Avalos, PhD

Longer drive time to the nearest retailer was associated with lower odds of cannabis use (aOR per additional 5-minute drive time, 0.96 [95% CI, 0.95-0.98]; P < .001; aOR for \geq 20-minute drive vs <5 minutes, 0.78 [95% CI, 0.69-0.88]; P < .001) (**Figure**). Similarly, having more retailers within a 15-minute drive was associated with greater odds of cannabis use compared with not living within a 15-minute drive of a retailer (aOR per additional retailer, 1.02 [95% CI, 1.01-1.02]; P < .001; aOR for 1-2

FIGURE 1. Level of Wave 1 Cannabis Use and Incident Wave 2 Prescription Opioid Use Disorder in the NESARCa



^a NESARC=National Epidemiological Survey on Alcohol and Related Conditions; wave 1 was conducted in 2001 and 2002, and wave 2 in 2004 and 2005.

Trajectories of cannabis use and risk for opioid misuse in a young adult urban cohort

Beth A. Reboussin^{a,*}, Jill A. Rabinowitz^b, Johannes Thrul^b, Brion Maher^b, Kerry M. Green^c, Nicholas S. Ialongo^b

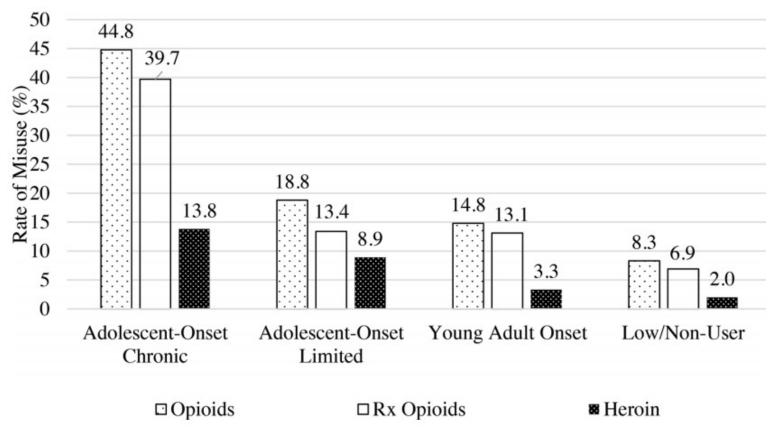
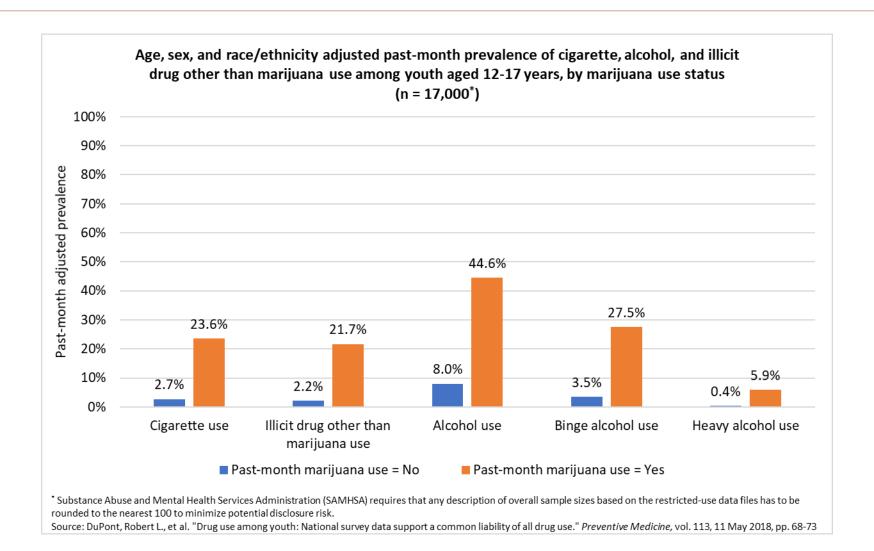


Fig. 2. Rates of Opioid Misuse Between Ages 19-26 by Cannabis Trajectory Group.

Drug Sequencing



Proceed Cautiously

Aaron Weiner, PhD

aaron@weinerphd.com www.weinerphd.com







