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Implications of Cannabis Legalization on Juvenile Justice Outcomes and Racial Disparities

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Abstract

Introduction: The objective of this study is to assess the changes in rates of juvenile cannabis criminal allegations and racial disparities in Oregon after legalization of cannabis (July 2015) for adults.

Methods: This study included all allegations for cannabis-related offenses that occurred from January 2012 to September 2018 in Oregon. Negative binomial regression models were used to examine monthly cannabis allegations rates over time and tested differences between youth of color and white youth, adjusting for age, gender, and month the allegation occurred. Analysis was conducted in January–March 2019.

Results: Cannabis allegation rates increased 28% among all youth and 32% among cannabis-using youth after legalization. Rates of allegations were highest for American Indian/Alaska Native and black youth. Rates for black youth were double that of whites before legalization and this disparity decreased after legalization. For American Indian/Alaska Native youth, rates were higher than whites before legalization and this disparity remained unchanged.

Conclusions: Adult cannabis legalization in Oregon was associated with increased juvenile cannabis allegations; increases are not explained by changes in underage cannabis use. Relative disparities decreased for black youth but remained unchanged for American Indian/Alaska Native youth. Changing regulations following adult cannabis legalization could have unintended negative impacts on youth.

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INTRODUCTION

One of the motives for legalizing cannabis was to reduce adult criminal charges for cannabis crimes;[1] indeed, states that have legalized have observed substantial reductions in adult arrests for cannabis crimes.[2–6] The impact of adult cannabis legalization on juvenile justice outcomes in the U.S., however, has received little attention. Though these issues were not at the forefront of the legalization debate, the ramifications for youth could be large.[7]

In all U.S. states that have legalized, cannabis remains an illegal substance for minors (aged <21 years) that is subject to status offenses and criminal penalties. Legalization may reduce the perceived health and social risks of cannabis use among youth, which may subsequently increase use and youth being charged under the law for using cannabis.[8] Youth arrests can be considered a social determinant of health that leads to lifelong detrimental effects.[9] Youth who are frequently stopped by police experience heighted emotional distress[10] and juvenile arrest is associated with lower educational attainment and limited employment opportunities compared with their peers. Youth incarceration is also associated with serious problems in adulthood including recidivism, worse mental and physical health outcomes,[11,12] and ultimately an increased risk of premature death.[13]

In November 2014, Oregon voters passed Measure 91, making Oregon the third state to legalize the local production, processing, and sale of cannabis to people aged ≥21 years for non-medical use. Possession of small amounts of cannabis (<1 ounce) became legal for adults on July 1, 2015. Following legalization, Oregon legislature passed new crimes pertaining to cannabis use and the commercial cannabis market.[14] Penalties for minors (aged <21 years) ranged in severity from violation-level status offenses (conduct that was not a crime if committed by an adult, similar to a >10 miles/hour speeding ticket) to felonies for transporting large quantities of cannabis.[15] The new minor in possession status offense included <1 ounce cannabis possession and recent consumption resulting in a $135–$1000 fine.[16,17] There is concern that new penalties may increase the likelihood of youth being charged under the law for cannabis-related activities.

Inequities in the juvenile justice system may be exacerbated by cannabis legalization. In the U.S., youth of color disproportionately enter the juvenile justice system and rates of arrest are more than five times higher for black youth compared with white youth.[18] The likelihood of juvenile arrest is also strongly associated with age and gender.[19] In Washington state, although adult arrest rates declined, disparities in cannabis arrests for blacks increased significantly after legalization.[5] In Colorado, the count of juvenile cannabis arrests after legalization was declining (2012–2017) and the reduction was more pronounced for white youth compared with Hispanic or black youth; however, the lack of available data prior to legalization has made it difficult to assess the effects of legalization on racial/ethnic disparities in arrests.[3] Therefore, it is crucial to be able to assess the effects that adult cannabis legalization has on existing racial/ethnic disparities in the juvenile justice system.

This study aims to: (1) understand the statewide impacts of cannabis legalization in Oregon on the rates of cannabis-related juvenile justice allegations and (2) assess whether legalization has affected racial/ethnic disparities within those outcomes. Results of this study

will support the work of policymakers toward developing equitable cannabis policies and minimizing unintended consequences for youth.

METHODS

Existing population-based data were used to conduct a quasi-experimental study using an interrupted time series analysis.

Study Population

Data were obtained from the Oregon Juvenile Justice Information System (JJIS) through the Oregon Youth Authority. JJIS is a statewide integrated electronic information system that captures all services administered to youth through juvenile justice departments in Oregon.[20] This study included 18,779 allegations resulting from cannabis-related status and criminal offenses (that range in penalty from violations to felonies), committed by youth aged 10–17 years during January 2012–September 2018 and reported in JJIS with complete demographic information (Appendix Table 1). Allegations include all cannabis-related offenses that are referred by law enforcement to juvenile departments prior to adjudication and disposition (before appearing in court and sentencing).

Oregon's total youth population was described using annual Census Bureau/National Center for Health Statistics estimates by age, race, Hispanic origin, and sex (2012–2017). Multiracial populations were not included because JJIS does not allow for youth to report more than one race. The 2017 population estimates were imputed for 2018 allegations.

Measures

The outcome of interest was the aggregate count of cannabis-related allegations for every month within multiple subpopulations characterized by sex (male, female), non-Latinx race/ethnicity (white, black, American Indian/Alaska Native [AI/AN], Asian/Pacific Islander, and Latinx), and age group (10–14 years, 15–17 years). Individual youth could be included more than once in the study if they had more than one cannabis-related allegation during the study period.

The policy variable represents the average effect of adult legalization, coded as "1" starting in July 2015 and "0" before. Regression models centered time on the date of adult cannabis legalization, July 2015. Therefore, a 1-unit change in exposure corresponded to a relative difference in the rate of allegations between 2 months.

Prevalence data for youth cannabis use were collected from the school-based Oregon Student Wellness Survey, a biennial survey that is administered during even-numbered school years (2012, 2014, 2016, 2018) to approximately 60,000 6th, 8th, and 11th graders per year.[21] Current cannabis use is characterized as any use within the past 30 days. Current cannabis use within each subpopulation (gender, race/ethnicity, age group) from the survey among 8th and 11th graders was used to estimate the prevalence of use for youth aged 10–14 years and 15–17 years, respectively.

Statistical Analysis

Data processing and analysis were conducted in Stata, version 15.1. A series of negative binomial models estimated changes in juvenile cannabis allegations. The dependent variable was the monthly count of juvenile cannabis allegations within each demographic subgroup. The primary independent variables were the effect of legalization (policy variable), time (month), and the change in time trend after legalization (interaction term between policy and month). Age group, race/ethnicity, gender, and month the allegation occurred were included as covariates. The offset (i.e., denominator) was the natural log of the corresponding total youth population estimates or youth cannabis user population estimates.

The fitted model provided estimates of the log RR (i.e., rate ratio). The number of juvenile cannabis allegations that could have been expected in the absence of legalization was estimated from the linear time trend prior to legalization.

To understand the effects that changes in youth cannabis use have on allegations post-legalization, a second identical model was fit that used the population of youth who reported cannabis use within each subgroup as the denominator. For this model, the offset was the natural log of population estimates weighted by statewide Oregon Student Wellness Survey prevalence estimates of current cannabis use within each demographic group. The hypothesis was that there would be no change in rates of allegations among youth reporting cannabis use after legalization.

To assess the impacts of adult legalization on racial/ethnic disparities in juvenile cannabis allegations, the model was reparametrized to include the effects of legalization for specific racial/ethnic groups. Specifically, indicator variables were created for allegations that occurred before and after legalization for each community of color. In this way, the relative disparities between communities of color and white youth (the ref group) could be directly estimated before and after legalization. Post-estimation linear contrast statements were conducted to determine if disparities had significantly changed after legalization compared with before legalization for each racial/ethnic group. Models were adjusted for age group, gender, and month the allegation occurred. Again, a second identical model was fit that used youth cannabis user population estimates within each subgroup as the denominator.

RESULTS

Before legalization, the number of juvenile cannabis allegations was declining: from 3,762 in 2012 to 2,631 in 2014. Declines stopped after adult cannabis legalization: 2,709 allegations were reported in 2016. The majority of allegations were for possession of small amounts (<1 ounce) of cannabis (Appendix Text).

The rate of juvenile cannabis allegations varied greatly by race/ethnicity over time. Though white youth made up the largest proportion of cannabis allegations (72%), the highest rates of cannabis allegations occurred among AI/AN youth, followed by black youth and then white youth (Figure 1).

Youth cannabis use was consistently highest among AI/AN and black youth for both 8th and 11th graders (e.g., 31% and 28%, vs 21% among white 11th graders in 2018). Prevalence did not change significantly within any specific group following legalization (data not shown).[4]

The rate of juvenile cannabis allegations among all Oregon youth (aged 10–17 years) increased by 28% (RR=1.28, 95% CI=1.14, 1.44 (Table 1) after adult legalization. The decline in allegations per month seen prior to legalization (RR=0.99, 95% CI=0.98, 0.99) flattened after legalization (RR=1.01, 95% CI=1.01, 1.02). When considering changes among the population of youth reporting cannabis use, post-legalization allegations increased by 32% (RR=1.32, 95% CI=1.18, 1.48), with similar patterns in pre-legalization and post-legalization trends.

Applying pre-legalization trend slopes, there would have been an estimated 541 fewer cannabis allegations per year among youth reporting cannabis use, and a total of 1600 fewer allegations in the first 3 years since adult legalization of cannabis in Oregon (Figure 2).

The AI/AN youth were 264% more likely to receive a cannabis allegation compared with white youth before legalization (RR=2.64, 95% CI=2.31, 3.01) and this disparity did not significantly change after legalization (RR=2.43, 95% CI=2.10, 2.81) (Figure 3). Black youth were nearly twice as likely to receive a cannabis-related allegation than white youth before legalization (RR=1.88, 95% CI=1.66, 2.13) and this disparity significantly decreased after legalization (RR=1.23, 95% CI=1.06, 1.43). Latinx and Asian/Pacific Islander youth had rates of cannabis allegations that were lower than whites, both before and after legalization. When using the population of cannabis-using youth as the denominator, racial disparities in juvenile cannabis allegations were less pronounced (Appendix Text).

DISCUSSION

This study is the first to the authors' knowledge to consider the implications of adult cannabis legalization on juvenile justice outcomes among youth who report cannabis use and evaluate the impacts of legalization on racial disparities in juvenile justice outcomes. Results indicate that the rate of juvenile cannabis allegations increased after legalization, including after adjustment for cannabis use trends among youth. The largest disparity in allegations before legalization was among AI/AN youth relative to white youth, and this disparity remained unchanged after legalization. For black youth, disparities were reduced following legalization, but rates remained greater than for white youth. The magnitude of disparities was less pronounced among youth who reported using cannabis, but patterns were similar.

Results from this study provides empirical evidence that adult legalization of cannabis in Oregon is associated with a rise in juvenile cannabis allegations statewide. Youth are being exposed to cannabis retailers and advertisements,[22,23] which may alter social norms by reducing perceived risks of cannabis use, increasing cannabis consumption and subsequently resulting in more juvenile justice penalties for youth who use cannabis.[8] However, if legalization resulted in increased youth cannabis use, an increase in the total population rate of allegations after legalization and no change in the rate of cannabis allegations among

youth reporting cannabis use would have been expected. Instead, the rate of cannabis allegations increased, and that increase was even greater among youth who reported using cannabis. These findings are different from another study that found legalization of cannabis in four states (Colorado, Washington, Alaska, and Oregon) had no effect on juvenile cannabis possession arrests reported in Uniform Crime Reporting (2006–2016).[6] The current study builds on this previous work, and reasons for differences in study findings may include a longer follow-up time in the current study, additional cannabis offenses were included, and changes within a particular legalized state were examined given the variability in criminal justice policies between legalized states.

One possible explanation for this increase in Oregon's youth allegation rates may be new cannabis offenses targeting underage use (people aged <21 years) that were enacted after adult legalization.[14–16] Specifically, the cannabis minor in possession status offense was enacted in July 2015 and includes both underage possession and consumption of cannabis in the past 24 hours. Including consumption in the offense may have increased the likelihood of youth being arrested. Therefore, increases in juvenile cannabis allegations could be driven by the effects of legalization that include changes in offense definition, policies and enforcement practices, and if youth are more likely to use cannabis in public spaces after legalization and be caught by law enforcement.

Differences in underage cannabis use by racial groups affected the size of relative disparities in cannabis allegations between communities of color and white youth. The prevalence of underage cannabis use was highest among black and AI/AN youth for the entirety of the study period and adjusting for prevalence attenuated the relative disparities in allegations among cannabis users. For black youth, relative disparities were reduced after legalization, although still significantly greater than white; this finding is in contrast with a recent report from Washington state where the relative disparity in adult cannabis-related arrests increased for blacks after cannabis legalization.[5] Disparities between AI/AN and white youth were greatest both before and after legalization and were only significantly reduced among youth who reported cannabis use.

This study provides critical insights on how adult cannabis legalization is affecting the amount and level of police intervention for youth. Any person who enters the criminal justice system, even if they are not taken into custody, is engaging in a process that is both taxing and draining of resources.[24] For youth, their future in the system is determined largely by key individuals within the juvenile justice system (school resource officer/police officer, juvenile department, probation officer, district attorney, and judge). These intermediaries can influence the type and severity of penalty youth receive for a cannabis allegation. Compared with other crime data sources (e.g., arrest or court data), this study focused on allegation-level data because they capture the earliest point of contact with the juvenile justice system. Subsequent measures (e.g., arrest or adjudication data) would not be representative of the initial contact with the juvenile justice system.

Although adults are less likely to be arrested for cannabis-related crimes after legalization in Oregon,[4] this study found that more youth are entering the juvenile justice system, and persistence of racial disparities, represents an important public health problem with negative

health consequences for youth.[12,25] This study did not identify the underlying mechanisms of racial disparities; however, examination of other literature would point to disproportionate school disciplinary actions by race/ethnicity[26] as contributing to the school-to-prison pipeline and sustained disparities seen in juvenile cannabis allegations after legalization. Over-representation of youth of color in Oregon's juvenile justice system have been well documented[27] and the Oregon Youth Authority has invested in training juvenile justice professionals in cultural competency and developing culturally specific programming services.[28,29]

Solutions require an interdisciplinary approach with attention to policies, law enforcement, and education systems. A recent study among California teens found universal decriminalization of cannabis possession (2011) reduced rates of teens cannabis arrests, violent crime and school dropout.[30] This finding supports the interconnectedness of social systems and the mutual benefit that criminal justice policies can have on youth.

Limitations

The study has several limitations. First, the ecologic design could not account for individual-level factors related to the susceptibility of arrest (beyond gender, race/ethnicity, and age) or the role that school disciplinary policies or law enforcement practices may have on increases in juvenile cannabis allegations. For instance, school disciplinary policies and referrals to juvenile departments may have changed after legalization. In addition, law enforcement resources vary greatly across the state of Oregon (e.g., in 2018 rural counties had one sworn police officer for every 43 youth compared with one officer for every 63 youth in urban counties).[31] Given this variability, impacts of legalization may be different within specific communities.

The study assessed changes in the rates of allegations; because youth may have more than one allegation per referral (e.g., allegations for possession and delivery in the same referral), this may overestimate the number of individual youth committing cannabis crimes. The study population contained 18,779 cannabis allegations within 17,355 juvenile referrals among 17,175 youth. One percent of youth in the study population (180/17,175) received more than one juvenile referral during the study period (January 2012–September 2018). However, the impact on study findings was minimal given that the majority of referrals with multiple cannabis allegations occurred prior to adult legalization (71%, 1,013/1,424) and most (69%, 980/1,424) referrals with two or more cannabis allegations occurred among white youth.

School-based survey data were used to estimate cannabis use among youth because they are representative of students in Oregon.[21] However, some students who do not attend school (e.g., those who have dropped out) are at higher risk of substance use and incarceration,[32,33] although others may not attend owing to alternative school programs (e.g., attending community college or internships) and may be at less risk. Some research suggests relevant survey biases specific to communities of color, such as recanting prior substance use[34] and being less likely to report substance use.[35] Underestimates in substance use among communities of color could have led to overestimating disparities when the population of cannabis users was the denominator. Additionally, 8th grade respondents (typically aged 13–

14 years) estimated cannabis use for those aged 10–14 years and 11th grade respondents (typically aged 16–17 years) for those aged 15–17 years as the offset in models. Having estimates from relatively older youth may have overestimated cannabis use among students, but differences would be consistent over the study period and thus may not affect interpretation of trends.

Misclassification of race/ethnicity among youth in the JJIS data likely underestimated the true disparities in allegations between youth of color and whites. Race and ethnicity are recorded by the juvenile department from police reports or youth self-report. A consistent race/ethnicity data collection form is not used across all law enforcement agencies and has resulted in an under-reporting of Latinx youth.[36]

CONCLUSIONS

As more states legalize cannabis and open commercial cannabis markets, it is imperative to consider the unintended consequences of legalization on youth. This study found that juvenile cannabis allegation rates increased after adult legalization of cannabis possession in Oregon, and this increase could not be explained by changes in cannabis use among youth. Increases in allegation rates may be explained by changes in offense definitions and criminal penalties subsequent to adult legalization, enforcement practices, and youth public consumption of cannabis that may increase their likelihood of being caught by law enforcement. Furthermore, racial/ethnic disparities in juvenile cannabis allegations still existed after legalization for AI/AN youth and black youth compared with white youth. Results of this study support incorporating juvenile justice considerations into cannabis policies, to prevent lasting negative consequences for youth.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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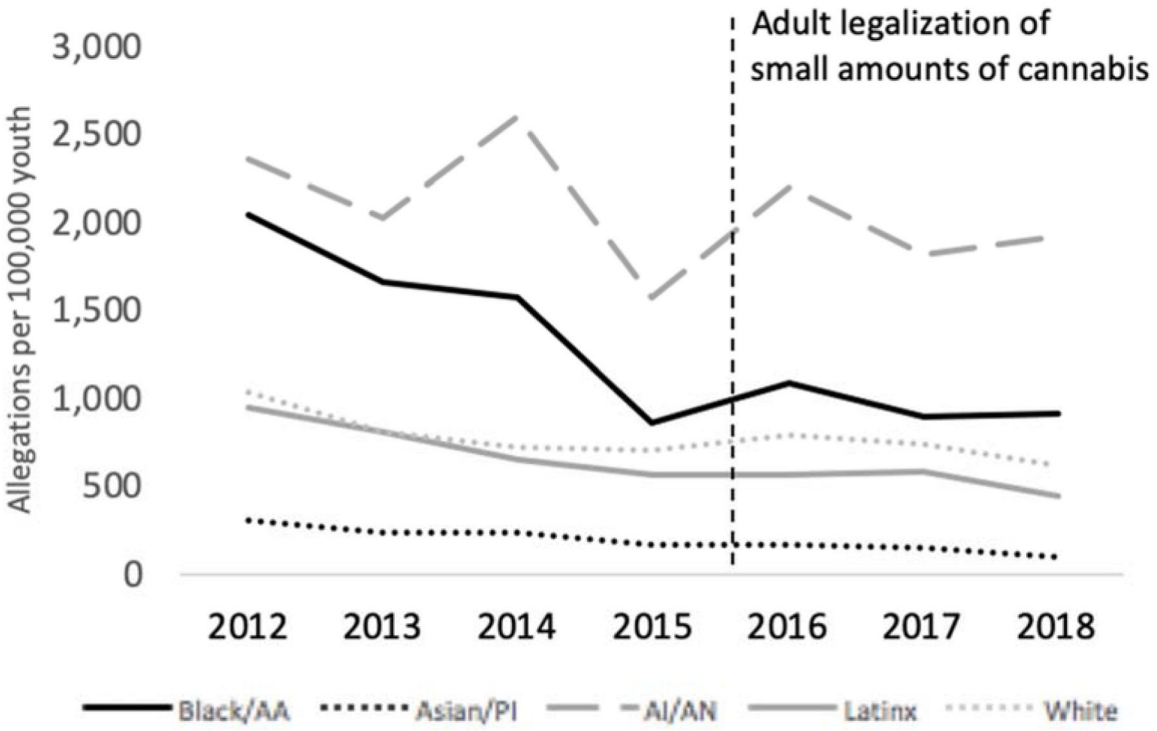

Figure 1.

Juvenile cannabis allegation rates per 100,000 youth, 2012–2018.

AA, African American; PI, Pacific Islander; AI/AN, American Indian/Alaska Native.

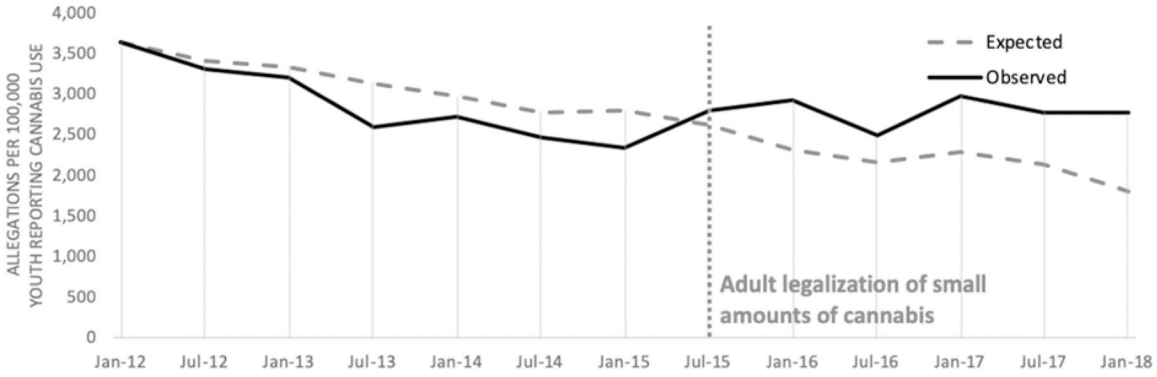

Figure 2.

Expected and observed allegation rates per 100,000 youth reporting cannabis use over time, Oregon.

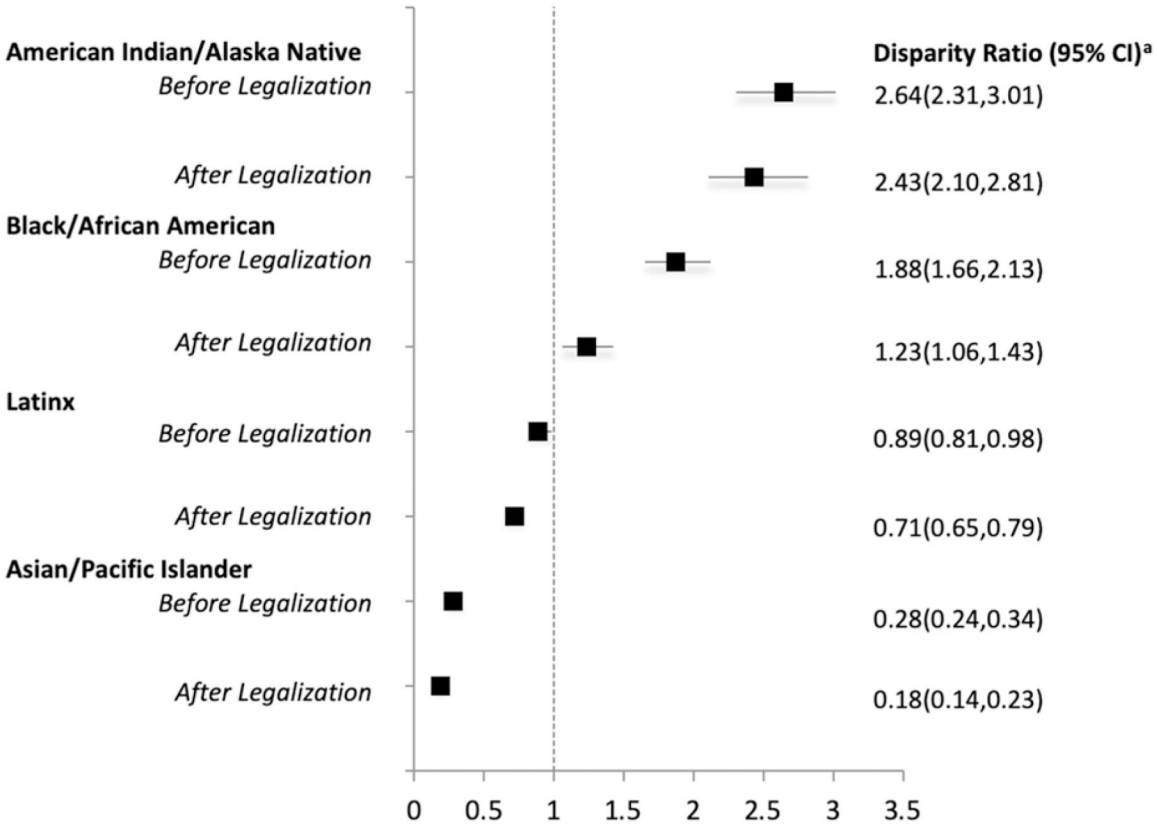

Figure 3.

Rate ratios comparing each racial/ethnic group to white youth for juvenile cannabis allegations pre/post adult legalization of cannabis.

[a]The negative binomial models included an offset for age, gender, and race/ethnicity-specific annual population estimates. The model was adjusted for age, gender, and month that allegation occurred. White youth were used as the referent category. From linear contrasts, the disparity ratio did not significantly reduce for American Indian/Alaska Natives after legalization (*p*-value: 0.412); significantly reduced for black/African Americans (*p*-value: <0.001), Latinx (*p*-value: 0.001), and Asian/Pacific Islanders (*p*-value: 0.002).

Table 1.

Rate Ratios (95% CIs) for Association Between Juvenile Cannabis Allegations and Adult Cannabis Legalization

Variable	Rate ratio (95% CI) among all youth (age 10–17 years)[a]	Rate ratio (95% CI) among youth reporting cannabis use (age 10–17 years)[b]
Legalization of adult possession (July 2015)	1.28 (1.14, 1.44)	1.32 (1.18, 1.48)
Time trend before legalization (in months)	0.99 (0.98, 0.99)	0.99 (0.99, 0.99)
Change in time trend after legalization (in months)	1.01 (1.01, 1.02)	1.01 (1.00, 1.01)

[a]The negative binomial models included an offset for age, gender, and race/ethnicity-specific annual population estimates. The model was adjusted for age (RR: 4.20 [95% CI: 3.96, 4.45] 15− 17 years vs 10−14 years), race/ethnicity (RR: 1.56 [95% CI: 1.41, 1.71] black/African American, RR: 0.23 [95% CI: 0.20, 0.27] Asian/Pacific Islander, RR: 2.53 [95% CI: 2.29, 2.79] American Indian/Alaska Native, RR: 0.80 [95% CI: 0.75, 0.86] Latinx, white as referent category), gender (RR: 2.70 [95% CI: 2.55, 2.87] male vs female) and month that allegation occurred (RR: 2.29 [95% CI: 2.11, 2.50] school year vs summer).

[b]The negative binomial models included an offset for age, gender, and race/ethnicity-specific annual population estimates of youth reporting cannabis use. The model was adjusted for age (RR: 1.72 [95% CI: 1.63, 1.83] 15−17 years vs 10−14 years), race/ethnicity (RR: 1.04 [95% CI: 0.94, 1.14] black/African American, RR: 0.41 [95% CI: 0.36, 0.48] Asian/Pacific Islander, RR: 1.74 [95% CI: 1.58, 1.92] American Indian/Alaska Native, RR: 0.62 [95% CI: 0.58, 0.66] Latinx, white as referent category), gender (RR: 2.70 [95% CI: 2.55, 2.87] male vs female) and month that allegation occurred (RR: 2.33 [95% CI: 2.13, 2.53] school year vs summer).