



# Cannabis use disorders are comparatively prevalent among nonwhite racial/ethnic groups and adolescents: A national study



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## ABSTRACT

The racial/ethnic composition of the US population is shifting, with the nonwhite population growing faster than whites. We examined cannabis use disorder (CUD) prevalences and correlates in seven racial/ethnic groups. We included cannabis use (CU) prevalence as a comparison. Data were from the 2005–2011 National Surveys on Drug Use and Health ( $N = 394,400$ ). Substance use among respondents aged  $\geq 12$  years was assessed by computer-assisted, self-interviewing methods. The following were included as control variables: age, sex, family income, government assistance, county type, residential stability, major depressive episode history, arrest history, nicotine dependence, alcohol disorder, and survey year. Past-year CU prevalence increased significantly from 10.45% in 2005 to 11.41–11.54% during 2009–2011. Compared with whites, mixed-race individuals had higher odds of CU; Asian Americans and Hispanics had lower odds of CU. There were no significant yearly changes in CUD prevalence in the sample during 2005–2011 (1.58–1.73%). Compared with whites, individuals who were mixed-race, black, and Native American had higher odds of CUD; Asian Americans had lower odds. In aggregate, 15.35% of past-year cannabis users met criteria for a CUD in the 12-month period. Past-year cannabis users who were black, Native American, Hispanic, or Asian American had higher odds of CUD than white users. In each racial/ethnic group, adolescent cannabis users generally showed greater odds of CUD than adult users. Behavioral health indicators (major depressive episode, arrest history, nicotine dependence, alcohol disorder) were associated with CU and CUD. In conclusion, CUD disproportionately affects nonwhite groups and youth.

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## 1. Introduction

Globally, an estimated 2.6–5.0% of the population aged 15–64 years used cannabis in the past year (United Nations Office on Drugs and Crime, 2012). In the United States, survey data estimate that approximately 18.1 million people are current cannabis users (7.0% of the general population aged  $\geq 12$  years). This far exceeds prescription opioids, which are the second most commonly used drug class with 4.5 million current nonmedical users or 1.7% of the general population aged  $\geq 12$  years (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012a). In 2011,

there were an estimated 3.1 million first-time users of any illicit drug; of them, 2.6 million used cannabis (SAMHSA, 2012a). The majority of illicit drug use disorders result from cannabis use (CU). Of the estimated 6.5 million general US population aged  $\geq 12$  years who have an illicit drug use disorder in a year, 65% of them (representing 1.6% of the general population aged  $\geq 12$  years) have a cannabis use disorder (CUD) (SAMHSA, 2012a).

There are a number of potential health risks of CU. CU may impair driving and is an important contributing factor for serious or fatal injury crashes (Institute for Behavior and Health, 2013). Repeated CU is associated with a broad range of psychiatric conditions (addiction; mood, anxiety, or personality disorders; and psychotic symptoms) (Hurd et al., 2013; Lev-Ran et al., 2012; Rubino et al., 2012; Ruiz-Veguilla et al., 2013; Stone et al., 2013). Data from a national survey show that adults (aged  $\geq 18$  years) with a past-year mental disorder represent 72% of all cannabis users

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in the sample (Lev-Ran et al., 2012). The identified associations between CU and health conditions tend to show a dose-related pattern, indicating greater severity among frequent cannabis users (Lev-Ran et al., 2012; Rubino et al., 2012; Ruiz-Veguilla et al., 2013; Stone et al., 2013). Additionally, there are age-related effects from cannabis exposure. Repeated CU in adolescence confers a particularly elevated risk for experiencing psychiatric disorders, including psychotic conditions (Rubino et al., 2012; Ruiz-Veguilla et al., 2013; Schubart et al., 2011). Adolescence is a critical phase for brain development in areas associated with impulsivity, judgment, and executive function. Maturation and development of the endocannabinoid systems, which are involved in the regulation of many emotional and appetitive behaviors, could be impacted by chronic CU. Frequent CU might be associated with subtle but lasting neurobiological changes that may impact neural circuitry (emotion, cognition, learning) and behaviors to enhance the vulnerability to the development of a variety of psychiatric conditions ([http://www.ncbi.nlm.nih.gov/pubmed?term=Realini%20N%5BAuthor%5D&cauthor=true&cauthor\\_uid=19559364](http://www.ncbi.nlm.nih.gov/pubmed?term=Realini%20N%5BAuthor%5D&cauthor=true&cauthor_uid=19559364); Realini et al., 2009; Schneider, 2008).

During the past decade, state-specific policies related to cannabis (medical use, legalization) have contributed to changes in the availability of cannabis (increase in supply, access) and perhaps changes in perceived norms or harm of CU (more tolerant of use, lower perceived risk of harm) (Friese and Grube, 2013; Levy, 2013). There are continuous concerns about the impact of medical cannabis and legalizing recreational use on increasing cannabis problems (Joffe, 2004; Levy, 2013). To date, 20 states and Washington, DC, have medical cannabis, two have legalized recreational use and four states have legislation pending. Cerdá et al. (2012) found that states with medical cannabis had a higher prevalence of CU than states without. Data from the Drug Abuse Warning Network (DAWN) indicate an increase in cannabis-related emergency department visits (SAMHSA, 2012b). Additional studies have suggested a pattern of common medical cannabis diversion and CU by adolescents in substance abuse treatment (Salomonsen-Sautel et al., 2012; Thurstone et al., 2011). Together, these data demonstrate the need to investigate the extent of cannabis problems in adolescents and adults.

Additionally, there have been notable shifts in racial/ethnic compositions of the US population with major nonwhite groups growing faster than the white group (US Census Bureau, 2011). Asian Americans, Hispanics, Native Hawaiians/Pacific Islanders (NHs/Pis), and mixed-race individuals (>1 race) are among the fastest-growing groups, followed by Native Americans (American Indians/Alaska Natives) and blacks. These changing demographics require research to gauge their extent of CUD in demographic subgroups to inform research and prevention efforts. No studies have specifically examined and compared prevalences and correlates of CUD in demographic subgroups. Because of smaller population sizes of Asian American, Native American, NH/PI, and mixed-race people, illicit drug use studies typically focus on whites, blacks, and Hispanics, and include small numbers of members from these nonwhite groups. Asian American, Native American, NH/PI, and mixed-race people are often pooled as “others” or omitted from the reports (Johnston et al., 2012).

The increased concern about the potential impact of increased cannabis availability on cannabis problems, coupled with changing demographic profiles of the US population, point to the need for research to evaluate population-based estimates of CUD and their correlates for racial/ethnic groups. The nationally representative samples of the National Survey on Drug Use and Health (NSDUH) include individuals aged  $\geq 12$  years from all major racial/ethnic groups, allowing for comparisons of CUD between adolescents and adults. To include adequate numbers of understudied groups (Asian

American, Native American, NH/PI, and mixed-race people) to generate reliable estimates of prevalences and correlates of CUD, multiple years of public-use data files were used. The independent and cross-sectional 2005–2011 NSDUHs use similar designs and permit analysis of the same variables from the pooled sample.

We examined 1) recent national trends in past-year prevalence of CUD to gauge the extent of CUD in the general population, and 2) conditional prevalences of CUD among past-year cannabis users to identify demographic differences in the likelihood of CUD. The latter provides empirical information to inform prevention and etiological research. We also determined correlates of CUD for each racial/ethnic group to examine similarities and differences across groups. To facilitate interpretation of findings, we included trends in past-year CU prevalence as a comparison.

## 2. Methods

### 2.1. Data source

Public-use data files from the 2005–2011 NSDUHs were analyzed to characterize recent national trends in CUD. All respondents aged  $\geq 12$  years were included to provide a comprehensive description of age-related patterns in CUD. The NSDUH is the only national survey designed to provide ongoing estimates of drug use and disorders in the United States (SAMHSA, 2006, 2012a). The 2005–2011 surveys used multistage area probability sampling methods to select a representative sample of the civilian, noninstitutionalized population aged  $\geq 12$  years. Residents of households from the 50 states (including shelters, rooming houses, and group homes) as well as civilians residing on military bases were included. The design oversampled people aged 12–25 years. Due to a large sample size, there was no need to oversample racial/ethnic groups, as was done before 1999. The NSDUH's annual sample of respondents was considered representative of the US general population aged  $\geq 12$  years.

Respondents were interviewed at their home for about an hour. They were assured that their names would not be recorded and their responses would be kept strictly confidential, and all study procedures and protections were carefully explained. Respondents' sociodemographics were assessed by computer-assisted personal interviews; substance use questions of a sensitive nature were assessed using an audio computer-assisted self-interviewing (ACASI) method to increase respondents' reports of substance use and sensitive behaviors (Turner et al., 1998). The latter was designed to increase honest reports of substance use by allowing respondents to either read the questions on a computer screen or listen to the questions read aloud by the computer through headphones, and then enter their responses directly into the computer.

To include adequate numbers for racial/ethnic groups with smaller population sizes (Native American, Asian American, NH/PI, and mixed race) for detecting meaningful racial/ethnic differences in CUD, we pooled public-use data files from 2005 to 2011 ( $n = 55,279$ – $58,379$ /year). These years used similar designs, allowing pooled analyses of the same variables (SAMHSA, 2006, 2012a). Weighted response rates of household screening and interviewing for these years were 87–91% and 73–76%, respectively.

### 2.2. Study variables

#### 2.2.1. Demographics

Self-reported race and ethnicity were assessed separately. The NSDUH defined seven mutually exclusive groups: non-Hispanic whites, non-Hispanic blacks, non-Hispanic Native Americans (American Indians/Alaska Natives), non-Hispanic NHs/Pis, non-Hispanic Asian Americans, mixed-race individuals (>1 race), and

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