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# Trends and correlates of marijuana use among late middle-aged and older adults in the United States, 2002–2014



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#### ABSTRACT

*Background:* Recent trend studies suggest that marijuana use is on the rise among the general population of adults ages 18 and older in the United States. However, little is known about the trends in marijuana use and marijuana-specific risk/protective factors among American adults during the latter part of adulthood. *Method:* Findings are based on repeated, cross-sectional data collected from late middle-aged (ages 50–64) and older adults (ages 65 and older) surveyed as part of the National Survey on Drug Use and Health between 2002 and 2014.

*Results:* The prevalence of past-year marijuana use among late middle-aged adults increased significantly from a low of 2.95% in 2003 to a high of 9.08% in 2014. Similarly, the prevalence of marijuana use increased significantly among older adults from a low of 0.15% in 2003 to a high of 2.04% in 2014. Notably, the upward trends in marijuana use remained significant even when accounting for sociodemographic, substance use, behavioral, and health-related factors. We also found that decreases in marijuana-specific protective factors were associated with the observed trend changes in marijuana use among late middle-aged and older adults, and observed a weakening of the association between late-middle aged marijuana use and risk propensity, other illicit drug use, and criminal justice system involvement over the course of the study.

*Conclusions:* Findings from the present study provide robust evidence indicating that marijuana use among older Americans has increased markedly in recent years, with the most evident changes observed between 2008 and 2014.

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#### 1. Introduction

The past two decades have been a period of tremendous change with respect to public policy and perception related to the use and distribution of marijuana in the United States (US). Beginning with California's "Compassionate Use Act of 1996", we have witnessed a steady expansion of policies designed to medicalize, decriminalize, and legalize the private use of *Cannabis sativa* (Lee, 2012). At present, marijuana can be used for medical purposes in 28 states and the District of Columbia, the recreational use of marijuana has

http://dx.doi.org/10.1016/j.drugalcdep.2016.11.031 0376-8716/© 2016 Elsevier Ireland Ltd. All rights reserved. been legalized in a handful of states, and more than half (57%) of American adults believe marijuana should be legal (Geiger, 2016). Based on the pattern of results observed for marijuana-related ballot propositions in the November 2016 elections, it seems likely that the expansion and implementation of marijuana liberalization policies will continue to take place across the US.

Cognizant of these changes, scholars have conducted a growing number of epidemiological trend studies designed to examine potential changes in marijuana use and marijuana-specific risk/protective factors (Center for Behavioral Health Statistics and Quality, 2015; Compton et al., 2016; Fleming et al., 2016; Hasin et al., 2015a, 2015b, 2016; Johnson et al., 2015a, 2015b; Johnston et al., 2014; Salas-Wright and Vaughn, 2016a, 2016b; Salas-Wright et al., 2016b; Salas-Wright et al., 2015). By and large, these stud-

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ies suggest that marijuana use among adults is on the rise. For instance, Hasin et al. (2015a), drawing from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), found that past year marijuana use among adults increased from 4.1% in 2001–2002 to 9.5% in 2012–2013. Compton et al. (2016) report similar findings from the National Survey on Drug Use and Health (NSDUH) with past year marijuana use among adults increasing from 10.4% in 2002–13.3% in 2014. More recent evidence indicates that the prevalence of marijuana use among American adults has continued to increase, nearly doubling from 7% in 2013–13% in 2016 (McCarthy, 2016). Taken collectively, these studies provide rather compelling evidence that important changes in adult marijuana use are underway.

While the aforementioned studies provide critical insight into trends among American adults in general, we know less about trends in marijuana use during two particularly salient developmental stages during the latter part of adulthood: late-middle age (ages 50–64) and older adulthood (ages 65 and older). These age groups are important to consider for several reasons. For one, they are large and growing. Indeed, the US Census Bureau projects that both age groups will increase in size in the coming years, with robust growth in the proportion of older adults in the US population (Ortman et al., 2014). Moreover, prior research indicates that a noteworthy proportion of Americans ages 50 and older report recent marijuana use and suggest that older marijuana users report greater levels of psychiatric distress, mental illness, and comorbid substance use (Choi et al., 2016; DiNitto and Choi, 2011; Han et al., 2016).

Several recent studies do provide us some insight into trends in marijuana use during the latter stages of adulthood. For instance, Hasin et al. (2015a) reports an increase in the prevalence of marijuana use among adults ages 45-64 (2001/2002: 1.6%, 2012/2013: 5.9%) and 65 and older (2001/2002: 0.0%, 2012/2013%: 1.3) between NESARC Wave 1 and the NESARC-III. Similarly, a recent report by Stoner (2016) displays the prevalence of marijuana use among adults ages 50-64 and 65 and older using data from the NSDUH between 2002 and 2014. Importantly, however, neither of the aforementioned studies provide an in-depth assessment of trend data, examine trends in marijuana specific risk factors, nor systematically examine key correlates of marijuana use. Han et al. (2016) also recently examined trends in the prevalence of marijuana use among adults ages 50 and older using NSDUH data collected between 2006/2007 and 2012/2013. Regretfully, however, while this study examined a number of important behavioral health correlates, many key risk behaviors and marijuana-specific risk/protective factors were omitted, and the bulk of analyses were conducted with late-middle aged and older adults aggregated into a singular analytic sample.

#### 2. The present study

The present study aims to provide a systematic examination of the trends and correlates of marijuana use among late middleaged (ages 50–64) and older adults (ages 65 and older) in the US by employing data from a large, population-based study collected between 2002 and 2014 (i.e., the NSDUH [SAHMSA, 2014]). Specifically, we present prevalence estimates for marijuana use and conduct tests of trend while accounting for sociodemographic, substance use, risk behavior, and behavioral health-related factors. We also examine trends in marijuana-specific protective factors and assess the degree to which changes in these marijuana-related factors are related to trends in marijuana use. Finally, we examine the association between marijuana use and comorbid substance use, risk behavior, criminal justice system involvement, and behavioral health outcomes, paying particular attention to changes in the link between marijuana use and these outcomes over time.

#### 3. Method

#### 3.1. Sample

This study examines public-use data collected between 2002 and 2014 as part of the NSDUH. The NSDUH provides population estimates for an array of substance use and health-related behaviors in the US general population. NSDUH participants include household residents; civilians residing on military bases; and residents of shelters and group homes. The design and methods are summarized briefly here, but a detailed description of NSDUH procedures is available elsewhere (SAHMSA, 2014). Since 2002, a total of 723,283 respondents have completed the NSDUH survey; however, the current study restricted analyses to respondents to those corresponding to the oldest two general age categories available in the NSDUH data file (i.e., late-middle aged [ages 50–64, n = 46,600] and older adults [ages 65 and older, n = 29,418]).

#### 3.2. Measures

*3.2.1. Marijuana use.* We examined self-reports of past 12-month use of marijuana or hashish (0 = no use, 1 = one or more instance of use).

3.2.2. Marijuana-specific factors. We examined three variables related to the perception of marijuana use and access to marijuana. Concerning marijuana disapproval, each respondent was asked, "How do you feel about adults trying marijuana or hashish once or twice? with response options including 'neither approve nor disapprove' (1), "somewhat disapprove" (2), and "strongly disapprove" (3). In terms of marijuana access, respondents were asked, "How difficult or easy would it be for you to get some marijuana, if you wanted some? with response options ranging from 'very easy' (1) to "probably impossible" (5). Respondents were also asked about perceptions of risk of marijuana use. They were asked, "How much do people risk harming themselves physically and in other ways when they smoke marijuana once or twice a week?" with response options ranging from "no risk" (1) to "great risk" (4).

3.2.3. Comorbid substance use and risk behavior. We examined past 12-month use of tobacco and illicit drugs other than marijuana (e.g., cocaine, hallucinogens, opioids, etc.) and binge alcohol use-specifically, five or more drinks on the same occasion-over the past 30 days (the NSDUH does not include a past 12-month binge drinking variable). We also examined several risk behaviors, including: driving under the influence of alcohol or illicit drugs, illicit drug selling, theft of an item worth more than \$50, and attacks with the intent to seriously harm others, as well as past year criminal justice system involvement. For each of the aforementioned substance use and risk behavior variables, respondents reporting one or more instances of use/involvement were coded as 1 and all other respondents coded as 0. We also created an index ( $\alpha = 0.82$ ) based on two variables measuring risk propensity.

3.2.4. Behavioral health conditions. We examined four variables measuring behavioral health conditions–anxiety, depression, human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS), and sexual transmitted diseases (STD)–based on respondent reports of past year diagnosis by a doctor/medical professional (0 = no, 1 = yes).

3.2.5. Sociodemographic factors. Sociodemographic characteristics included age, gender, race/ethnicity, family income, education,

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