



Short communication

Age trends in rates of substance use disorders across ages 18–90: Differences by gender and race/ethnicity

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ABSTRACT

Background: Although research has documented age differences in substance use, less is known about how prevalence of substance use disorders (SUDs) vary across age and differ by gender and race/ethnicity.

Methods: Time-varying effect models (TVEMs) were estimated on data from the National Epidemiologic Survey of Alcohol and Related Conditions–III (NESARC III; $N = 36,309$), a nationally representative survey of the adult population. The sample was 44% male; 53% White, 21% Black, 19% Hispanic/Latino, 6% other race/ethnicity. Prevalence of four SUDs (alcohol, tobacco, cannabis and opioid use disorders) were flexibly estimated across ages 18–90 by gender and race/ethnicity.

Results: Estimated SUD prevalences were generally higher for men compared to women at most ages until the 70s. However, disparities by race/ethnicity varied with age, such that for most SUDs, estimated prevalences were higher for White participants at younger ages and Black participants at older ages.

Discussion: Results suggest relatively constant disparities by gender across age, and a crossover effect for Black and White participants. Findings demonstrate that Black individuals in midlife may be an important target of intervention programs for some substances.

1. Introduction

Substance use disorders (SUDs) contribute to considerable morbidity and mortality, including premature mortality, infectious disease, and comorbid mental health conditions, as well as societal costs from lost productivity, health care costs, and crime (Center for Behavioral Health Statistics and Quality, 2015; Bouchery et al., 2006; Degenhardt and Hall, 2012). These disorders are not distributed evenly across the population; instead, prevalence varies across age, and by gender and race/ethnicity. A new method, the time-varying effect model (TVEM) can be used to understand age-varying differences in SUDs, and to estimate periods at which health disparities are more pronounced. In this study, we used TVEM to estimate prevalence of four SUDs (alcohol use disorder, tobacco use disorder, cannabis/marijuana use disorder, and opioid use disorder) across ages 18–90 by gender and race/ethnicity in a nationally representative U.S. sample.

In the US, 14% of individuals meet criteria for alcohol use disorder (AUD; Grant et al., 2015a,b), 13% for tobacco use disorder (TUD; Falk et al., 2006); 4% for cannabis use disorder (CUD; Hasin et al., 2015), 1% for opioid use disorder (OUD; Center for Behavioral Health

Statistics and Quality, 2015; Saha et al., 2016). Men generally report higher rates of substance use disorders than women (Grant et al., 2015a,b; Schulte et al., 2009). Racial/ethnic differences in SUDs vary by drug. Recent data indicates AUDs are lower among Black and Latino compared to White adults (Grant et al., 2015a,b), and tobacco use and nicotine dependence is lower among Black and Hispanic compared to White individuals (Hu et al., 2006; SAMHSA, 2015; Thomas et al., 2016). White and Black adults have similar rates of past year CUD, while Latinos have lower rates (Hasin et al., 2015), and OUDs are lower among Black compared to White and Latino adults (SAMHSA, 2015).

However, disparities in SUDs are likely not consistent across the lifespan. Age-varying gender and racial/ethnic differences in substance use have been documented in adolescence and young adulthood (Chen and Jacobson, 2012; Evans-Polce et al., 2014; Kandel et al., 2011). For example, a racial/ethnic crossover effect has been found such that Black adolescents have lower rates of use compared to White adolescents; however, in young adulthood this difference reverses such that rates are higher among Black individuals compared to White individuals (Chen and Kandel, 2002; Geronimus et al., 1993; Kandel et al., 2011; Ensminger et al., 2016). However, less is known about age-varying

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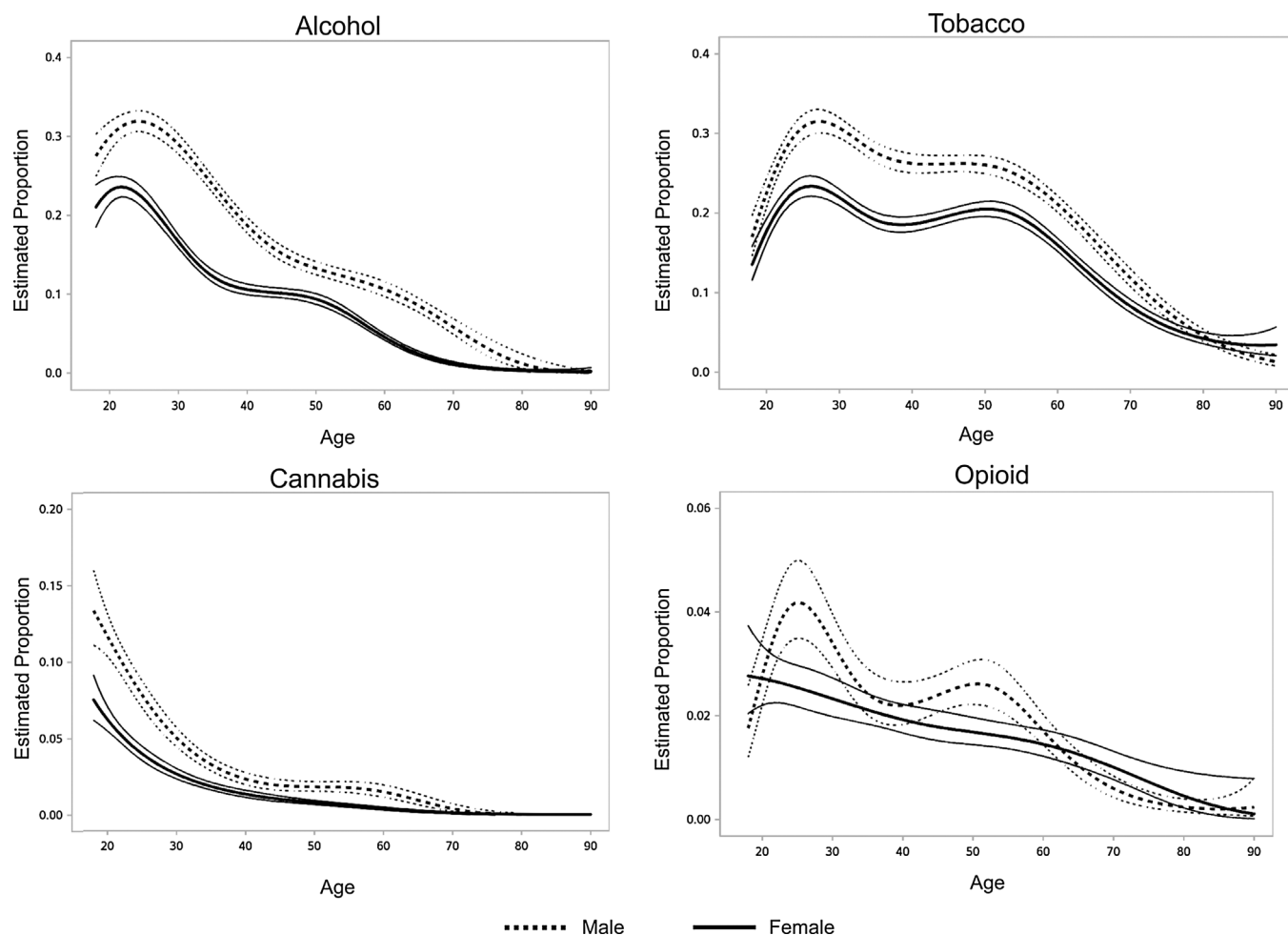


Fig. 1. Estimated proportion of substance use disorders across ages 18–90, by gender. Thick black lines represent estimate; thin grey lines represent 95% confidence intervals.

differences in SUDs, or how disparities in SUDs may extend or weaken for midlife or older adults. Such information can be used to ensure programs target the most at-risk groups of individuals at particular ages or periods of risk.

A new method, the time-varying effect model (TVEM; Tan et al., 2012) can flexibly estimate when disparities are greatest and when crossovers occur. Because TVEM allows for estimation of curves that do not require a specified parametric form, it can identify precise periods of change, such as ages when differences by race/ethnicity are significant. When nationally representative data and weights are used in TVEM, analyses can provide precise estimates of age-varying trends for particular population subgroups. TVEM has been used to understand gender and racial/ethnic differences in substance use among adolescents and young adults (Evans-Polce et al., 2014). The current study applies TVEM to a nationally representative sample of U.S. adults to examine age-varying disparities in SUDs by gender and race/ethnicity across the adult lifespan (ages 18–90).

2. Materials and methods

2.1. Study population and design

This study used data from the National Epidemiologic Survey of Alcohol and Related Conditions–III (NESARC-III), a nationally representative, cross-sectional study of the non-institutionalized adult population in the US collected in 2012–2013 (Grant et al., 2014, 2015a,b). Participants were recruited through a multi-stage sampling plan, with oversamples of ethnic minority respondents. The overall

response rate was 60%. The final sample contained 36,309 participants (44% male; 53% White, 21% Black, 19% Hispanic/Latino, 6% other race/ethnicity; $M_{age} = 45.6$, $SD = 17.5$).

2.2. Measures

Our primary outcomes, measures of *past-year substance use disorders*, were measured using the Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5; Grant et al., 2015a,b). For each substance, participants were asked if they had experienced 11 different symptoms, which were aligned with DSM-V diagnostic criteria (sample item: “Give up or cut down on activities that you were interested in or that gave you pleasure in order to [use substance]”). Consistent with DSM-V cutoffs (American Psychiatric Association, 2013), we coded individuals as having a level of symptoms consistent with SUD if they experienced at least 2 symptoms within the past year. We focus on four different SUDs: AUD, TUD, CUD, and OUD. For AUD, questions referred to alcohol. For TUD, questions referred to “tobacco and nicotine, including cigarettes, cigars, a pipe, snuff, chewing tobacco, or e-cigarettes.” For the other disorders, participants answered questions about whether they experienced symptoms for any drug, then selected which drugs were associated with these symptoms. CUD was coded for symptoms related to marijuana, and OUD was coded for symptoms of prescription opioids or heroin.

2.3. Plan of analysis

To examine the estimated prevalence of the four SUDs across ages

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