Prevalence and correlates of ever having a substance use problem and substance use recovery status among adults in the United States, 2018

Christopher M. Jones[a,*], **Rita K. Noonan**[a], **Wilson M. Compton**[b]

[a]Centers for Disease Control and Prevention, Atlanta, GA, USA

[b]National Institute on Drug Abuse, Bethesda, MD, USA

Abstract

Background: Expanding access to treatment and recovery services is key to reducing substance use-related harms. Fundamental to expanding such services is better understanding the populations identifying themselves as in recovery. This study uses nationally representative data to estimate prevalence and correlates of recovery in the U.S.

Methods: Data are from the 43,026 adults (aged 18 or older) participating in the 2018 National Survey on Drug Use and Health. Based on self-reported data, we estimate prevalence of ever having a substance use problem, the percentage in recovery among those with a substance use problem, and a multivariable logistic regression model to explore associations of recovery status with demographic characteristics and lifetime mental health problems. Among adults reporting a substance use problem, we compare prevalence of substance use by recovery status, followed by a multivariable model examining associations between each substance used and being in recovery.

Results: More than 1 in 10 adults (27.5 million) in the U.S. reported ever having a substance use problem, and, among those with a problem, nearly 75 % (20.5 million) reported being in recovery. Reporting lower prevalence of using substances in the past year and having received treatment for their substance use problem were associated with being in recovery. Ever having a mental health problem was highly prevalent among those reporting a substance use problem.

Conclusions: The provision and expansion of substance use treatment services continues to be important to reduce harms related to substance use, especially for those with both substance use and mental health disorders.

*Corresponding author at: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway, Atlanta, GA 30341, USA. fjr0@cdc.gov (C.M. Jones).

Keywords

Substance use; Recovery; Substance use treatment; Mental health; Alcohol; Illicit drug; Tobacco

1. Introduction

In 2018, approximately 65.9 million adults reported past-month binge drinking and 29.9 million reported past-month illicit drug use or prescription drug misuse (Substance Abuse and Mental Health Services Administration, 2019). Negative consequences are well documented: 67,367 Americans died of a drug overdose death in 2018 (Hedegaard et al., 2020); more than 88,000 deaths each year are attributable to excessive alcohol use (Centers for Disease Control and Prevention, 2013), and 19.9 million adults met criteria for DSM-IV defined substance use disorder (Substance Abuse and Mental Health Services Administration, 2019).

Fundamental to expanding the implementation of services needed to address these serious concerns is accurate understanding of the populations with substance use problems for whom recovery may be most likely. Although there is some research documenting characteristics of remission for certain substance use disorders (Lopez-Quintero et al., 2011; Blanco et al., 2013; White, 2012) recent research is limited., The few recent studies have attempted to estimate substance use recovery using internet-based samples (Kelly et al., 2017; Laudet, 2013). The largest of the internet-based studies, using a nationally-representative address-based probability sample, estimated that approximately, 9.1 % (22.35 million) of adults in the U.S. in 2017 had resolved a substance use problem (Kelly et al., 2017). Although these studies provide essential insights, they lack information about individuals with a substance use problem but not in recovery. To address this gap, we used nationally representative data from a large in-person survey on substance use in the U.S. to estimate prevalence and correlates of recovery.

2. Materials and methods

2.1. Data source

Data are from the 2018 National Survey on Drug Use and Health (NSDUH). NSDUH provides nationally representative data on substance use among the U.S. civilian, noninstitutionalized population. Additional details about NSDUH methods are available (Substance Abuse and Mental Health Services Administration (SAMHSA, 2019).

2.2. Measures

NSDUH ascertains lifetime and past-year use of tobacco, alcohol, marijuana, hallucinogens, inhalants, cocaine, methamphetamine and heroin, lifetime and past-year injection drug use, past-year misuse of prescription opioids, sedatives or tranquilizers, and stimulants, and lifetime and past-year receipt of substance use treatment. Past-month nicotine dependence was assessed using the Nicotine Dependence Syndrome Scale (Shiffman et al., 2004). Past-month binge alcohol use was defined as drinking five or more drinks on the same

occasion for males and four or more drinks on the same occasion for females on at least 1 day in the past 30 days (SAMHSA, 2019).

Although questions based on DSM-IV diagnostic criteria for substance abuse and dependence and certain mental disorders have been used in the NSDUH since at least 2002 to determine past-year disorders, for the first time in 2018, NSDUH respondents were asked lifetime questions about self-perceived substance use problems (not including tobacco) and recovery from their substance use problem. Specifically, "Do you think you ever had a problem with your own drug or alcohol use?" and "At this time do you consider yourself to be in recovery or recovered from your own problem with drug or alcohol use?". Similarly, self-perceived mental health problems and recovery were assessed for the first time with the questions: "Do you think you ever had a problem with your own mental health?" and "At this time do you consider yourself to be in recovery or recovered from your own mental health problem?". This analysis focused on these new substance use problem, mental health problem, and recovery questions.

In addition to substance use and mental health variables, NSDUH captures information on sociodemographic characteristics: age, sex, race/ethnicity, county-type of residence, annual household income, educational attainment, employment status, and health insurance status.

2.3. Data analysis

All analyses were based on 43,026 adults aged 18 years or older contained in the 2018 NSDUH public-use file (Substance Abuse and Mental Health Data Archive, 2018). First, we estimated the percentage and 95 % confidence intervals (95 % CIs) of adults who reported ever having a substance use problem overall, by sociodemographic characteristics, and by mental health problem status (no lifetime problem, lifetime problem but not in recovery, and lifetime problem and in recovery). Second, we estimated the percentage of adults who reported ever having a substance use problem who reported being in recovery overall and by the same subgroups. Third, we fit a multivariable logistic regression model to examine sociodemographic and mental health characteristics associated with being in recovery among adults who reported ever having a substance use problem. Results are presented as adjusted odds ratios (aORs) and 95 % CIs.

Next, among adults who reported ever having a substance use problem, we examined substance use histories by recovery status. We estimated percentages and 95 % CIs of each group (recovery and not in recovery) that reported lifetime and past-year use of each specific substance, and lifetime and past-year substance use treatment. Finally, we fit multivariable models to provide aORs and 95 % CIs reflective of the association between each substance use variable and being in recovery, controlling for sociodemographic characteristics and mental health problem status. All analyses were conducted with Stata v15.1 to account for NSDUH complex survey design and sample weights.

3. Results

3.1. Prevalence of ever having a substance use problem

In 2018, 11.1 % (95 % CI:10.7 %–11.6 %) or approximately 27,500,900 U.S. adults reported ever having a substance use problem (Table 1). Prevalence was: 8.1 % (95 % CI:7.6 %–8.6 %) among females and 14.4 % (95 % CI:13.7 %–15.2 %) among males; 12.8 % (95 % CI:11.9 %–13.7 %) among 35–49 year-olds, 12.7 % (95 % CI:11.6 %–13.8 %) among 26–34 year-olds, 10.8 % (95 % CI:10.2 %–11.5 %) among those 50 years or older, and 7.2 % (95 % CI:6.6 %–7.7 %) among 18–25 year-olds.

Among adults with a lifetime mental health problem but not in recovery for the mental health problem, prevalence of ever having a substance use problem was 31.9 % (95 % CI:29.3 %–34.7 %); among adults in recovery from a lifetime mental health problem, prevalence was 29.7 % (95 % CI:27.7 %–31.8 %), and among adults without a lifetime mental health problem, prevalence was 7.0 % (95 % CI:6.7 %–7.4 %). Prevalence also varied by other sociodemographic characteristics examined (Table1).

3.2. Percentage of adults in recovery among adults with a substance use problem

Overall, 74.8 % of adults with a self-reported substance use problem (95 % CI:72.9 %–76.8 %), or approximately 20,542,800 adults, reported that they were in recovery or recovered from their substance use problem (Table 1). The percentages of adults in recovery varied by demographic characteristics and mental health status (Table 1).

3.3. Association between demographic characteristics and being in recovery among adults with a substance use problem

After adjustment for other demographic variables and mental health status, increased odds of being in recovery among adults who reported ever having a substance use problem were found for: age 50 years or older compared to 18–25 year-olds (aOR = 1.5, 95% CI:1.1–2.1); non-metro area residence compared to large metro area (aOR = 1.4, 95 % CI:1.0–1.8); having some college or an associates degree compared to college degree or higher (aOR =1.5, 95 % CI:1.1–1.9); other employment (e.g., retired, disabled, keeping house full time) compared to full-time employment (aOR =1.9, 95 % CI:1.4–2.5); and being in recovery from a lifetime mental health problem compared to not having a lifetime mental health problem (aOR = 1.6, 95 % CI:1.3–2.1). Characteristics associated with lowered odds of recovery among adults who reported ever having a substance use problem were: non-Hispanic black compared to non-Hispanic white (aOR =0.7, 95 % CI:0.5–0.9); and not being in recovery from a lifetime mental health problem compared to not having a lifetime mental health problem (aOR =0.4, 95 % CI:0.3–0.6).

3.4. Substance use histories among adults with a substance use problem by recovery status

Prevalence varied by specific substance and by recovery status among adults who reported ever having a substance use problem (Table 2). Alcohol, tobacco, and marijuana were the most commonly reported substances used by both those in and not in recovery. Among adults in recovery, 40.4 % (95 % CI:38.3 %–42.5 %) reported ever receiving substance use

treatment; 10.9 % (95 % CI:9.4 %–12.6 %) reported receiving substance use treatment in the past year. Among adults not in recovery, ever receipt of treatment was reported by 26.5 % (95 % CI:22.7 %–30.6 %), and past-year treatment was reported by 5.8 % (95 % CI:4.4 %–7.5 %).

3.5. Association between substance use and being in recovery

After adjustment for demographic characteristics and mental health status, compared to adults with a substance use problem and not in recovery, those in recovery had higher odds of: lifetime inhalant use (aOR = 1.2, 95 % CI:1.0–1.6), lifetime cocaine use (aOR = 1.3, 95 % CI:1.1–1.6), lifetime injection drug use (aOR = 1.6, 95 % CI:1.1–2.3) and lifetime (aOR = 1.9, 95 % CI:1.5–2.4) and past-year receipt of substance use treatment (aOR =2.2, 95 % CI:1.6–3.1) (Table 2). Those in recovery had lower odds of past-year alcohol use (aOR = 0.3, 95 % CI:0.2–0.4), past-month binge drinking (aOR = 0.3, 95 % CI:0.3–0.4), and past-year use of marijuana (aOR =0.5, 95 % CI:0.4–0.6), hallucinogens (aOR =0.4, 95 % CI:0.3–0.6), cocaine (aOR = 0.5, 95 % CI:0.4–0.7) and methamphetamine (aOR =0.6, 95 % CI:0.4–0.9), and past-year misuse of prescription sedatives/tranquilizers (aOR =0.7, 95 % CI:0.5–0.9) and prescription stimulants (aOR = 0.7, 95 % CI:0.5–0.9).

4. Discussion

Using nationally representative data, we found an estimated 11.1 % of U.S. adults reported ever having a problem with alcohol or drugs (other than tobacco) and 74.8 % of these individuals, more than 20.5 million adults, reported being in recovery. This finding is generally consistent with previous research by Kelly et al., which found an estimated 22.35 million adults in the U.S. that report having resolved a substance use problem(Kelly et al., 2017). In the context of historically high overdose deaths and a more than two decades-long substance use crisis in the U.S., the finding of such a large number and high percentage of individuals endorsing recovery is encouraging and contributes to the important narrative that recovery is achievable.

Analyses highlighted several key insights. First, formal treatment is important – those who reported lifetime treatment were nearly twice as likely to be in recovery. Yet, 60 % of respondents did not report any treatment, suggesting other pathways to recovery occur. The high percentage of individuals reporting no prior substance use treatment is inline with prior research indicating that resolution of problem substance use without external assistance (e.g., formal treatment, 12-step programs) is not uncommon (Kelly et al., 2017). Both strengthening existing systems of care and better understanding of various recovery pathways is warranted. Second, self-reported mental health problems and recovery from these problems were among the strongest correlates of both substance use problems and substance use recovery, confirming the well-known issue of comorbidity (Compton et al., 2007; Regier et al., 1990) and suggesting continued need to improve care for persons with co-occurring disorders. Third, given the importance of both substance use treatment and mental health services for recovery outcomes, addressing barriers or facilitators to service access and utilization, including payment policy changes, stigma reduction, and structural

barriers (e.g., lack of transportation, availability of insurance coverage, treatment deserts) along with the expansion of recovery support services is imperative.

Noteworthy findings among sociodemographic characteristics include a lack of association between income and insurance status and being in recovery, after accounting for other demographic and mental health characteristics; significantly elevated odds of being in recovery among non-metro residents compared those living in large metro areas; and persistent disparities among race/ethnicity groups, with lower odds of recovery among non-Hispanic black persons compared to non-Hispanic white persons despite lower rates of substance use problems among non-Hispanic black persons.

Finally, what it means to be "in recovery" may vary (White, 2012; White et al., 2012), and many who resolve substance use problems do not endorse being in recovery (Kelly et al., 2018). Our study shows that U.S. adults who report being in recovery have generally lower rates of past-year substance use than those not in recovery. However, a substantial number report past month tobacco dependence (18.9 %) and binge drinking (32 %) or past-year marijuana use (31 %). Taken together, these findings highlight the need for further research to understand diverging patterns of self-perceived substance use problems, ongoing substance use, treatment access and receipt, and recovery across sociodemographic groups in order to develop tailored services for specific populations.

4.1. Limitations

This study is subject to limitations. NSDUH is based on self-report and subject to recall and social desirability bias. NSDUH data are cross-sectional; thus, causal relationships could not be established. NSDUH includes noninstitutionalized civilians, so a small proportion of the U.S. population, such as active duty military personnel, homeless individuals not living in shelters, and incarcerated populations are excluded. Because these populations (particularly homeless and incarcerated adults) usually have higher prevalence of substance use compared to the general civilian noninstitutionalized population, rates of substance use problems may be underestimated (Compton et al., 2010). Individuals who have died from substance use-related problems, such as overdose deaths or excessive alcohol use, would not be captured in NSDUH and thus may also lead to underestimation of prevalence estimates in this analysis. NSDUH also has no information about how respondents may define "recovered" or "in recovery," and only a single question about having a substance use problem and a single question on recovery from a substance use problem was asked, limiting our ability to examine patterns for specific substances used. In addition, we are not able to determine the duration of recovery or whether individuals were in recovery at one time and then resumed substance use at a later point in time. NSDUH provides estimates of self-reported recovery status, it does not provide estimates of the number of persons receiving a diagnosis of a substance use disorder from a health care provider; thus, the estimates in this paper do not represent the number of people with a diagnosed substance use disorder. Finally, because NSDUH has no measures of lifetime substance use disorder status, we were unable to assess the contribution of a full substance use disorder diagnosis to lifetime recovery status.

4.2.   Conclusions

Over 27 million adults in the US report having a substance use problem in their lifetime, with the vast majority (20.5 million) reporting themselves as in recovery. Compared to those not in recovery, this majority reported similar or higher rates of lifetime substance use across a variety of substances, reported less past-year substance use, and were significantly more likely to have received substance use treatment. This finding, along with prevalent mental health problems among this population, point to the on-going importance of providing and expanding treatment services for substance problems and mental illness. Researching barriers and facilitators to service utilization and varied recovery outcomes is critical. Particular attention to matching specific population needs with services is warranted.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Disclaimer

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Table 1

Prevalence of Ever Having a Substance Use Problem, Percentage of Adults in Recovery, and Associations Between Demographic Characteristics and Being in Recovery Among Adults 18 Years or Older, United States, 2018. Source: National Survey on Drug Use and Health, 2018.

	Percentage of Adults that Report Ever Having a Substance Use Problem	Percentage of Adults That Report Being In Recovery Among Adults that Report Ever Having a Substance Use Problem	Association Between Demographic Characteristic and Being in Recovery[a]
	Percent (95 % CI)	Percent (95 % CI)	aOR (95 % CI)
Overall	11.1 (10.7–11.6)	74.8 (72.9–76.8)	–
Sex			
Female	8.1 (7.6–8.6)	75.5 (71.9–78.8)	Ref
Male	14.4 (13.7–15.2)	74.5 (72.1–76.8)	1.0 (0.8–1.2)
Age Group (years)			
18–25	7.2 (6.6–7.7)	69.4 (64.9–73.5)	Ref
26–34	12.7 (11.6–13.8)	72.4 (69.1–75.5)	1.2 (0.9–1.6)
35–49	12.8 (11.9–13.7)	69.5 (66.1–72.8)	1.1 (0.8–1.4)
50 or older	10.8 (10.2–11.5)	80.4 (77.0–83.4)	1.5 (1.1–2.1)
Race/Ethnicity			
Non-Hispanic white	13.4 (12.8–14.0)	75.9 (73.5–78.1)	Ref
Non-Hispanic black	7.4 (6.4–8.4)	67.7 (60.4–74.1)	0.7 (0.5–0.9)
Non-Hispanic other	6.2 (4.9–7.8)	69.1 (58.3–78.2)	0.8 (0.5–1.3)
Hispanic	7.4 (6.4–8.4)	75.7 (70.7–80.0)	1.1 (0.8–1.6)
County of Residence [b]			
Large metro	10.7 (9.8–11.5)	73.0 (69.9–75.8)	Ref
Small metro	11.9 (11.2–12.7)	75.9 (72.6–79.0)	1.1 (0.9–1.4)
Non-metro	11.2 (10.1–12.3)	79.7 (75.4–83.5)	1.4 (1.0–1.8)
Annual Household Income			
Less than $20,000	11.8 (10.6–13.1)	74.2 (69.3–78.5)	Ref
$20,000-$49,999	10.9 (10.1–11.8)	78.5 (75.6–81.1)	1.3 (0.9–1.9)
$50,000-$74,999	11.8 (10.8–12.9)	73.3 (67.4–78.4)	1.0 (0.7–1.5)
$75,000 or more	10.7 (9.8–11.6)	73.2 (69.3–76.7)	1.1 (0.7–1.6)
Education Status			
Less than high school	9.4 (8.3–10.6)	77.7 (71.0–83.3)	1.5 (1.0–2.4)

	Percentage of Adults that Report Ever Having a Substance Use Problem	Percentage of Adults That Report Being In Recovery Among Adults that Report Ever Having a Substance Use Problem	Association Between Demographic Characteristic and Being in Recovery[a]
	Percent (95 % CI)	Percent (95 % CI)	aOR (95 % CI)
High school graduation	11.0 (10.2–11.9)	74.0 (70.1–77.6)	1.1 (0.8–1.5)
Some college/associates degree	12.5 (11.7–13.3)	77.6 (74.8–80.2)	1.5 (1.1–1.9)
College degree or higher	10.5 (9.5–11.5)	71.5 (67.6–75.0)	Ref
Employment Status			
Full-time	12.2 (11.4–13.0)	71.8 (68.8–74.6)	Ref
Part-time	10.7 (9.3–12.1)	73.6 (68.5–78.2)	1.1 (0.8–1.5)
Unemployed	12.6 (10.8–14.7)	65.4 (56.3–73.5)	0.9 (0.6–1.4)
Other	9.5 (8.8–10.1)	83.0 (79.5–86.0)	1.9 (1.4–2.5)
Insurance Status			
Private or other insurance	10.7 (10.1–11.2)	75.9 (73.6–78.1)	Ref
Medicaid only	13.1 (11.5–14.6)	72.4 (67.0–77.2)	0.8 (0.6–1.1)
Uninsured	12.8 (11.5–14.2)	70.5 (65.1–75.4)	0.8 (0.6–1.1)
Mental Health Problems			
No lifetime mental health problem	7.0 (6.7–7.4)	75.3 (72.4–78.0)	Ref
Lifetime mental health problem, not in recovery	31.9 (29.3–34.7)	55.1 (49.4–60.7)	0.4 (0.3–0.6)
Lifetime mental health problem, in recovery	29.7 (27.7–31.8)	82.7 (79.9–85.2)	1.6 (1.3–2.1)

aOR = adjusted odds ratio.

[a]
multivariable model adjusted for all other variables in the table.

[b]
The Rural-Urban Continuum Codes are hierarchical, mutually exclusive classifications for all U.S. counties created by the U.S. Department of Agriculture. All population counts are from the 2010 Census representing the resident population. *Large metro* = counties in metro areas with a population ≥ 1 million persons. *Small metro* = counties in metros areas with populations between 250,000–1,000,000; counties in metro areas with populations < 250,000. Nonmetro = counties with urban populations ≥ 20,000 adjacent to a metro area; urban populations ≥ 20,000 not adjacent to a metro area; urban populations 2500–19,999 adjacent to a metro area; urban populations 2500–19,999 not adjacent to a metro area; rural or < 2500 urban populations adjacent to a metro area; and rural or < 2500 urban population not adjacent to a metro area. https://seer.cancer.gov/seerstat/variables/countyattribs/ruralurban.html.

Table 2

Substance Use Histories Among Adults Ever Having a Substance Use Problem, By Self-Reported Recovery Status, United States, 2018. Source: National Survey on Drug Use and Health, 2018

	In Recovery	Not In Recovery	Association Between Being in Recovery and Substance Use Outcome[a]
	Percentage (95 % CI)	Percentage (95 % CI)	aOR (95 % CI)
Tobacco			
Lifetime use	93.0 (91.7–94.2)	91.5 (87.8–94.2)	1.4 (0.9–2.2)
Past-year use	48.5 (46.3–50.8)	55.7 (51.4–59.9)	0.8 (0.7–1.0)
Past-month dependence	18.9 (17.5–20.5)	18.6 (15.6–22.1)	1.1 (0.9–1.4)
Alcohol			
Lifetime use	98.6 (97.7–99.1)	98.4 (96.9–99.2)	1.4 (0.6–3.6)
Past-year use	66.8 (63.9–69.6)	90.3 (87.3–92.6)	0.3 (0.2–0.4)
Past-month binge drinking[b]	32.0 (29.7–34.4)	64.6 (60.4–68.5)	0.3 (0.3–0.4)
Marijuana			
Lifetime use	87.6 (86.0–89.1)	87.0 (83.4–89.9)	1.3 (0.9–1.8)
Past-year use	31.3 (29.1–33.6)	50.2 (46.9–53.5)	0.5 (0.4–0.6)
Hallucinogen			
Lifetime use	54.0 (51.8–56.2)	55.0 (50.3–59.6)	1.1 (0.9–1.4)
Past-year use	5.0 (4.1–6.0)	12.0 (9.9–14.4)	0.4 (0.3–0.6)
Inhalants			
Lifetime use	31.5 (29.4–33.7)	30.0 (26.6–33.7)	1.2 (1.0–1.6)
Past-year use	1.5 (1.0–2.2)	**	0.7 (0.4–1.3)
Cocaine			
Lifetime use	55.1 (52.7–57.4)	49.9 (45.8–54.1)	1.3 (1.1–1.6)
Past-year use	6.4 (5.2–7.7)	14.0 (11.7–16.7)	0.5 (0.4–0.7)
Methamphetamine			
Lifetime use	28.4 (26.2–30.8)	25.1 (21.7–28.9)	1.2 (0.9–1.5)
Past-year use	3.5 (2.8–4.3)	6.9 (5.0–9.4)	0.6 (0.4–0.9)
Heroin			
Lifetime use	12.3 (10.8–14.0)	12.0 (9.2–15.6)	1.1 (0.8–1.5)
Past-year use	2.0 (1.4–2.9)	**	1.1 (0.6–1.8)

Association Between Being in Recovery and Substance Use Outcome[a]

	In Recovery Percentage (95 % CI)	Not In Recovery Percentage (95 % CI)	aOR (95 % CI)
Past-year Rx Opioid Misuse	12.2 (10.7–14.0)	14.5 (12.0–17.4)	0.9 (0.7–1.1)
Past-year Rx Sedative/Tranquilizer Misuse	7.9 (6.7–9.3)	12.4 (9.8–15.5)	0.7 (0.5–0.9)
Past-year Rx Stimulant Misuse	4.9 (4.1–5.8)	9.2 (7.5–11.3)	0.7 (0.5–0.9)
Injection Drug Use			
Lifetime	11.9 (10.3–13.7)	8.2 (5.7–11.5)	1.6 (1.1–2.3)
Past-year	2.1 (1.5–2.8)	**	1.0 (0.5–1.8)
Receipt of Substance Use Treatment			
Lifetime	40.4 (38.3–42.5)	26.5 (22.7–30.6)	1.9 (1.5–2.4)
Past-year	10.9 (9.4–12.6)	5.8 (4.4–7.5)	2.2 (1.6–3.1)

[a] Multivariable model adjusted for sex, age, race/ethnicity, county of residence, annual household income, education status, employment status, insurance status, mental health problems. aOR = adjusted odds ratio.

[b] Past-month binge alcohol use was defined as drinking five or more drinks on the same occasion for males and four or more drinks on the same occasion for females on at least 1 day in the past 30 days.

** Estimate suppressed due to low precision (see Table 3.2 -https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHMethodsSummDefs2018/NSDUHMethodsSummDefs2018.pdf).