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## Binge Drinking by Occupation Groups among Currently Employed U.S. Adults in 32 States, 2013–2016

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### Abstract

**Background:** Excessive alcohol use, including binge drinking (i.e., 5 drinks (males); 4 drinks (females), per occasion during the past 30 days), is associated with work-related injuries, absenteeism, and lost productivity. Binge drinking varies by sociodemographic characteristics (e.g., age, sex, income). However, information on binge drinking by occupation is limited.

**Purpose:** This study examined binge drinking prevalence, frequency, intensity, and total binge drinks per binge drinker by sociodemographic characteristics and occupation.

**Methods:** Data were analyzed from 358,355 currently employed U.S. adults who resided in the 32 states that administered the Behavioral Risk Factor Surveillance System industry and occupation questions during 2013–2016. Binge drinking was evaluated using weighted and adjusted prevalence models.

**Results:** Among currently employed adults in the 32 states, 20.8% reported binge drinking, with an average of nearly 49 times per year and an average intensity of 7.4 drinks per binge episode, resulting in 478 total binge drinks per binge drinker. The adjusted binge drinking prevalence ranged from 15.9% among community and social services workers to 26.3% among construction and extraction workers. The total annual binge drinks per binge drinker ranged from 207 drinks among community and social services workers to 749 drinks among construction and extraction workers.

**Conclusions:** One in five employed adults binge drink, and binge drinking varied across occupation groups. Widespread use of effective community-based strategies for preventing excessive alcohol use (e.g., regulating alcohol outlet density), as well as interventions tailored to specific occupation groups, could reduce binge drinking and improve occupational safety and health.

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## Keywords

Binge drinking; occupation; alcohol use; binge drinking frequency; binge drinking intensity; occupational safety and health

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## Introduction

Excessive alcohol consumption is responsible for 88,000 deaths annually in the United States (U.S.), including one in ten of all deaths among working-age adults (Stahre et al., 2014). Excessive alcohol use cost the U.S. \$249 billion in 2010, including \$179 billion in government tax revenue and employer expenses through lost productivity (Sacks et al., 2015). In relation to absenteeism, alcohol or drug abuse and dependence have represented 4.5% of lost wages (Foster & Vaughan, 2005). Binge drinking (i.e., 5 drinks for males; 4 drinks for females, per occasion during the past 30 days) is responsible for a majority of the deaths and costs from excessive drinking (Stahre et al., 2014), and is associated with health and social problems, including heart disease, violence, motor vehicle crashes, and unintended pregnancies (WHO, 2018). In 2015, 17.1% of U.S. adults reported binge drinking, consuming an annual total of 17.5 billion binge drinks (Kanny et al., 2018).

Excessive drinking has been linked to lost productivity, as well as verbal and physical aggression on the job, among employees of U.S. companies (McFarlin & Fals-Stewart, 2002; McFarlin et al., 2001; Dawson, 1994). The potential for occupational injuries increases with the frequency of excessive drinking, however, the links between negative productivity outcomes, including work-related injuries, and alcohol use among the workforce are multifactorial and complex (Frone, 2006; Frone, 2019). An analysis of data from the 2008–2011 National Survey of Work Stress and Health found that 13.8% of American workers surveyed reported drinking before and during work, working under the influence of alcohol, or working with a hangover during the previous year (Frone, 2019). In addition, an analysis of the 2016 National Survey of Drug Use and Health data showed that 31.5% of U.S. workers reported binge drinking during the past month (Frone, 2019). Workers are also twice as likely to be absent from work the day after consuming alcohol (McFarlin & Fals-Stewart, 2002). Notably, these are associations that have been documented between alcohol use and lost productivity; however, a causal relationship has not been established.

The prevalence, frequency, and intensity of binge drinking varies by sociodemographic characteristics. For example, the prevalence and intensity of binge drinking is higher among young adults aged 18–34 years compared to older age groups; however, half of the 17.5 billion total binge drinks consumed in 2015 were reported by adults age 35 years (Kanny et al., 2018). While the prevalence of binge drinking tends to increase with increasing education and household income levels, the total annual number of binge drinks consumed per binge drinker decreases with increasing education and household income levels (Kanny et al., 2020; Naimi et al., 2003; Kanny et al., 2013).

While some studies have examined alcohol use within specific occupation groups, such as members of the military, firefighters, and truck drivers (Mattiko et al., 2011; Piazza-

Gardner et al., 2014; Birdsey et al., 2015), information on how alcohol use varies by occupation group is limited. A national report by the Substance Abuse and Mental Health Services Administration (SAMHSA) showed that workers in the construction and extraction (17.8%) and installation, maintenance, and repair (14.7%) occupation groups had the highest prevalence of people who reported drinking 5 drinks on the same occasion on 5 days in the previous 30 days (Larson et al., 2007). State-specific studies of binge drinking by occupation were conducted in North Dakota and in California. In North Dakota, farm or ranch employees had the highest prevalence of binge drinking (45.3%), while healthcare workers had the lowest (13.2%) (Jarman et al., 2007). In California, installation (31.8%) and construction (31.4%) workers had the highest prevalence of binge drinking, while professional and related workers had the lowest (16.6%) (Barnes & Brown, 2013). However, whether these findings are representative of binge drinking by occupation groups across multiple states is unclear. Furthermore, neither of these studies assessed the frequency, intensity, or total binge drinks per binge drinker by occupation group.

The current study assessed differences in binge drinking prevalence, frequency, intensity, and total binge drinks per binge drinker among currently employed U.S. adults in 32 states by sociodemographic characteristics and by occupation groups. The results of the study are important for identifying disparities in binge drinking and can help inform the targeting of prevention strategies to reduce alcohol-related occupational injuries and absenteeism, and improve worker safety, health, and productivity.

## Materials and Methods

### Study Sample

The Behavioral Risk Factor Surveillance System (BRFSS), an annual, random-digit dial telephone survey of the noninstitutionalized, U.S. civilian population (aged 18 years) conducted in all states, the District of Columbia and territories, collects information on health risk behaviors, chronic illnesses, and use of preventive services. The BRFSS data are collected during each month of the calendar year, yielding a representative sample for the year. The questionnaire comprises a standard core set of questions administered annually or on a rotating basis (CDC, 2013). Jurisdictions can also elect to include optional modules and state-added questions. Beginning in 2013, the National Institute for Occupational Safety and Health (NIOSH) sponsored an optional BRFSS module to collect employed respondents' industries and occupations. From 2013 through 2016, 32 states administered the industry and occupation (I&O) optional module during at least one survey year (Supplemental Table A). In 2013, Washington state and Wyoming obtained industry and occupation through state-added questions and allowed NIOSH to use their data.

Across the 2013–2016 surveys, the median annual BRFSS response rate for all states ranged from 45.9% to 47.2% (CDC, 2014; CDC, 2015; CDC, 2016; CDC, 2017). The combined 2013–2016 BRFSS dataset included 859,921 respondents from the 32 states that collected I&O data, though the sample for this study was restricted to those who were currently employed or self-employed (n=429,344, 56.8%). Employed people who were missing information on occupation (n=27,271, 10.2%); were active duty military personnel (n=1,041, 0.3%); or reported conflicting information about work status (n=780, 0.2%) were

excluded. Respondents who had missing data on binge drinking (n=50,757, 7.9%) were also excluded, resulting in a final sample of 358,355 currently employed adult respondents during this four-year period.

## Measures

The I&O optional module contains one occupation and one industry question, which were asked of BRFSS respondents who reported being “employed for wages,” “self-employed,” or “out of work for less than one year” (the last were not included in the study sample of currently employed adults). Occupation was determined from responses to the following occupation question: “What kind of work do you do? (for example, register nurse, janitor, cashier, auto mechanic).” The BRFSS survey interviewer recorded responses as free-text, and the free-text responses were coded by NIOSH to align with one of 574 different U.S. Census Bureau codes from the 2002 system (NIOSH, 2018). For privacy and analytical purposes, these 574 occupation numeric codes were grouped into 22 Standard Occupational Classification (SOC) System major occupation groups created by the Bureau of Labor Statistics (BLS) and into 93 detailed occupation codes used by the CDC’s National Center for Health Statistics (NCHS) (NIOSH, 2008; BLS, 2018). Although responses from workers in the occupation groups may not represent all workers who are in each occupation group nationally, for brevity, workers from these groups are described as, for example, “construction workers” and “workers in manufacturing” henceforth.

The BRFSS contains the following four measures of alcohol consumption during the past 30 days: (1) number of drinking days; (2) average number of drinks consumed on days when alcohol was consumed; (3) number of binge drinking episodes; and (4) largest number of drinks consumed on an occasion. Binge drinking was defined as men consuming five or more drinks or women consuming four or more drinks, on an occasion. Binge drinking frequency was assessed based on the number of binge drinking occasions reported by binge drinkers per month and multiplied by twelve to calculate the average annual binge drinking frequency. The total number of annual binge drinking episodes was calculated by summing the annual number of binge drinking episodes for all binge drinkers. Binge drinking intensity was defined as the average largest number of drinks consumed by binge drinkers on an occasion (Esser et al., 2012). Following the methods of Kanny et al., 2015 total annual binge drinks was calculated by multiplying the total annual binge drinking frequency by binge drinking intensity of each binge drinker. Total annual binge drinks per binge drinker was calculated by dividing total annual binge drinks of all binge drinkers by the weighted total population of binge drinkers.

## Statistical Analysis

Measures of binge drinking were assessed overall and by sociodemographic characteristics and by major and detailed occupation groups. Sex, age, and race/ethnicity were included in the adjusted prevalence models. Inclusion of marital status, health insurance coverage, education level, and imputed household income in the adjusted prevalence models had a minimal effect on the prevalence estimates; therefore, those variables were not included in the final adjusted prevalence models.

Analyses were conducted using SAS, version 9.4 and SAS-callable SUDAAN, version 11.0.1, in 2017–2018. Survey weights were created for the 2013–2016 combined dataset that included I&O data based on procedures established by the CDC (CDC, 2013). For states that have multiple years of I&O data between 2013 and 2016, all years of data were included in the combined dataset (Table S1), and survey weights were modified accordingly.

## Results

During 2013 through 2016, approximately 20.8% of currently employed adults from the 32 states that collected I&O data reported binge drinking during the previous month, with an average of 478.3 total annual binge drinks per binge drinker (Table 1). Among them, on average, they had 48.7 binge drinking episodes per year, and consumed 7.4 drinks/episode. Binge drinking was most common among males (25.6%), non-Hispanic white workers (22.3%) and, non-Hispanic other racial or multiracial workers (22.1%). Compared with females, males had a higher frequency and intensity of binge drinking, and double the total annual binge drinks per binge drinker (males: 581.4 drinks; females: 271.7 drinks).

Although the prevalence of binge drinking was highest among those aged 18–24 years (28.9%) and 25–34 years (29.8%), those aged 55 years binge drank most frequently (54.6 episodes) (Table 1). Total binge drinks per binge drinker decreased with increasing education levels, ranging from 697.8 total binge drinks per binge drinker with less than a high school degree to 318.1 for workers with at least a college degree. Workers without health insurance reported a higher number of total binge drinks per binge drinker (643.1 drinks) than those who had health insurance coverage (447.5 drinks). While the prevalence of binge drinking did not vary by annual household income, workers with household incomes of \$75,000 or more reported fewer total binge drinks per binge drinker (417.6 drinks) than workers with incomes below \$75,000.

The prevalence of binge drinking reported by workers varied by occupation group (Table 2). The adjusted prevalence of binge drinking in 10 of 22 occupation groups exceeded the prevalence among all currently employed adults (20.8%). Also, the average total binge drinks per binge drinker in 7 occupation groups exceeded the level of all currently employed adults (i.e., 478.3 drinks) (Figure 1). Binge drinking was most common among those employed in construction and extraction (e.g. mining, oil and gas drill operators, etc.) (26.3%), legal (23.9%), and food preparation and serving related occupations (23.7%), while those employed in the computer and mathematical (16.4%) and community and social services occupations (15.9%) had the lowest prevalence of binge drinking (Table 2). Some occupation groups had a high prevalence of binge drinking but a low binge drinking frequency or intensity, and low total binge drinks per binge drinker. For example, workers in the legal occupation group had one of the highest binge drinking prevalence estimates (23.9%), but a lower than average binge drinking frequency (41.4 episodes/year), intensity (6.4 drinks/binge), and therefore, lower total binge drinks per binge drinker (333.8 drinks).

Binge drinking frequency was highest among workers in installation, maintenance, and repair occupations (64.2 episodes/year), followed by those working in construction and extraction (63.7 episodes/year). Binge drinking intensity was highest among workers in

farming, fishing, and forestry (9.4 drinks/binge); construction and extraction (9.2 drinks/binge); and installation, maintenance, and repair (8.9 drinks/binge). Similarly, the total annual binge drinks per binge drinker was highest among workers employed in construction and extraction (749.1 drinks); installation, maintenance, and repair (733.4 drinks); and farming, fishing, and forestry (638.7 drinks) (Figure 1). In contrast, workers in community and social services occupations had the lowest binge drinking frequency (30 episodes/year), intensity (6.0 drinks/binge), and total annual binge drinks per binge drinker (206.7 drinks) (Table 2; Figure 1).

Among the detailed occupation groups, the adjusted prevalence of binge drinking was highest among supervisors of production workers (31.6%); advertising, marketing, promotions, public relations, and sales managers (28.8%); and workers employed as sales representatives in services (28.6%) (Table 3). Workers in construction-related detailed occupation groups also had a high binge drinking prevalence, including extraction workers (37.1%), construction trades workers (26.2%), and other construction and related workers (24.4%). In contrast, the prevalence of binge drinking was lowest among librarians, curators, and archivists (12.0%), and textile, apparel, and furnishings workers (13.4%).

The prevalence of binge drinking differed by detailed occupation groups within the same major occupation group. For example, 21.8% of workers in the production major occupation group reported binge drinking; however, among the nine detailed production occupation groups, the binge drinking prevalence varied from 13.4% among woodworkers to 31.6% among supervisors of production workers (Table 3).

## Discussion

During 2013–2016, binge drinking during the previous month was reported by one in five currently employed adults from the 32 states that collected I&O data. To our knowledge, this study is the first to highlight differences in binge drinking among workers by occupation group, using several binge drinking measures. Workers in the construction and extraction occupations had the highest binge drinking prevalence (26%) and highest total annual binge drinks per binge drinker (749 drinks), while community and social services workers had the lowest binge drinking prevalence (16%) and lowest total annual binge drinks per binge drinker (207 drinks).

Workers in industries which are predominantly male, including construction and extraction and installation and maintenance and repair occupation groups (Bureau of Labor Statistics, 2018), were among those with the highest total binge drinks per binge drinker. This is consistent with a national report that found among full-time workers, males were three times more likely to report drinking 5 drinks on an occasion on 5 days in the previous 30 days in comparison to females (Larson et al., 2007). A systematic review of risk factors for alcohol use among workers in predominantly male industries found that, in addition to gender itself, other factors such as job insecurity, low levels of supervisory support, job demands, and workplace harassment may have an impact on alcohol consumption (Roche et al., 2015). The finding that binge drinking is particularly common among those working

in construction and extraction is consistent with state-specific findings from other studies as well (Barnes & Brown, 2013; Goplerud & McPherson, 2008).

In addition, people working in physically-demanding occupations are more likely to be injured and may be prescribed prescription opioids for pain relief (Franklin et al., 2009; Bernacki et al., 2012; Stover et al., 2006). Data from the Substance Abuse and Mental Health Services Administration has shown that workers in the construction industry have rates of illicit drug use and excessive alcohol use that are approximately twice the national average (Cook et al., 2004). Construction and extraction workers may also be at risk for polysubstance use, as binge drinking is associated with almost double the likelihood of misusing prescription opioids, increasing the chances of overdoses and deaths (Esser et al., 2019). Moreover, a study using the National Occupational Mortality Surveillance system data from 21 states found that construction and extraction workers had the highest proportional mortality ratios for drug overdose deaths overall, and for overdoses from heroin and prescription opioids (Harduar-Morano et al., 2018). Furthermore, physically-demanding occupations, including construction and extraction and farming, fishing, and forestry, are also among the occupation groups with the highest prevalence of not having health insurance coverage (Boal et al., 2018), reducing the likelihood of workers in these occupation groups receiving preventative services (e.g., alcohol screening and brief intervention).

Binge drinking was also common among workers in food preparation and serving related occupations, specifically among the food and beverage serving workers detailed occupation group. A national probability sample of employed adults showed that the food preparation and serving related occupation group had significantly increased odds of consuming alcohol before work and during the workday compared to 15 low risk occupation groups (Frone, 2006). Furthermore, data from a survey of 1,294 national restaurant chain employees indicated that 71.6% of servers and bartenders and 77.4% of kitchen staff drank excessively (Moore et al., 2009). Food and beverage serving workers may have convenient access to alcohol on the job, be in an environment with liberal alcohol workplace policies, and experience stress from high job demands (Tutenges et al., 2013; Kjeerheim et al., 1997; Moore et al., 2011).

Although more research is needed to examine whether there is a causal relationship between excessive alcohol consumption and reduced worker productivity, a comprehensive approach for addressing excessive drinking may help to reduce binge drinking and alcohol-related harms across occupation groups, and potentially improve workplace safety and health, reduce absenteeism and financial costs to the government and employers from lost productivity, and improve daily functioning on the job (Sacks et al., 2015; McFarlin and Fals-Stewart, 2002; McFarlin et al., 2001; Roche et al., 2015; Roche et al., 2008; Mangione et al., 1999; Frone, 2013; Frone, 2019). More widespread use of evidence-based population-level strategies, such as those recommended by the Community Preventive Services Task Force (e.g., increased alcohol taxes (Elder et al., 2010), regulating alcohol outlet density (Rammohan et al., 2011), and commercial host liability laws (ODPHP, 2018) could reduce binge drinking by increasing the price of alcohol and reducing access. Increased participation by employers in community coalition efforts to address excessive alcohol use (CDC, 2018) could lead to more widespread use of evidence-based strategies,

similar to employer participation in promoting smoke-free work environments (Halpern & Taylor, 2010).

The Clinical Preventive Services Task Force recommends alcohol screening and brief intervention (ASBI) for adults as an effective strategy for reducing excessive alcohol use in primary care clinical settings (CDC, 2018; Moyer, 2013). However, current use of ASBI is low (CDC, 2018; McKnight-Eily et al., 2014). Employers may consider implementing electronic screening and brief intervention (e-SBI), which has been recommended by the Community Preventive Services Task Force (Tansil et al., 2016; The Community Preventative Services Task Force, 2018). E-SBI involves carrying out ASBI using electronic devices (e.g., mobile devices or computers), so it can be administered to employees who work remotely. Web-based alcohol interventions may also be effective at reaching workers in a setting that may feel more comfortable than disclosing information about alcohol consumption in the workplace (Ames & Bennett, 2011). E-SBI can be integrated into employee assistance programs (EAPs) (Tansil et al., 2016; The Community Preventative Services Task Force, 2018).

While approximately 60% of full-time workers have access to an EAP at work (Bush et al., 2014; McPherson et al., 2010), the ability to offer e-SBI remotely may be beneficial for workers who do not work in a traditional office setting and, instead, are frequently out in the field or at a temporary worksite, such as construction or transportation workers. Some occupations have state-required trainings or certifications (e.g. Occupational Safety and Health Administration construction industry training), which may provide potential opportunities for delivering e-SBI to workers in a broad range of occupations and settings, including contractors or temporary workers. Several of the occupation groups with the highest prevalence for binge drinking are mobile, and lacking insurance, so more research is warranted to determine the extent to which ASBI or e-SBI can reduce binge drinking among these groups.

In addition to the evidence-based strategies for reducing excessive alcohol use and related harms, interventions tailored to specific occupation groups also warrant consideration as part of a comprehensive approach for reducing binge drinking, though additional evaluation studies would be helpful to further assess the efficacy and reproducibility of findings on intervention effects. For example, to reduce excessive alcohol consumption among food and beverage serving workers, a recent study evaluated a customized and team-oriented prevention program that included stress-coping and help-seeking skills with a focus on the restaurant work environment (Broome & Bennett, 2011). The rate of excessive drinking among the group of workers who participated in the prevention program declined by 13% during the 12-month follow-up period.

A framework for implementing workplace interventions to reduce excessive alcohol use suggests that due to variations in work environments (e.g. leadership, setting), employers may want to consider the type of strategy; program-workplace fit; level of intervention; and the cooperation of management and union leaders (Ames & Bennett, 2011). For example, a study field tested a workplace substance misuse prevention program among a sample of construction workers and found that the transient nature of the workforce, as well as

lack of union/supervisory buy-in, made it challenging to implement the prevention program (Cook et al., 2004), suggesting the importance of considering organizational factors when developing and implementing work-place specific interventions.

### Limitations

This study has several limitations. First, the BRFSS data are cross-sectional so it is not possible to make causal inferences. Second, the BRFSS data are also self-reported, which introduces the potential for several types of bias including recall, non-response, and social desirability bias. Alcohol consumption is underreported in national surveys such as the BRFSS (Rehm et al., 2010; Livingston & Callinan, 2015) and self-reported alcohol use in the BRFSS only accounts for about one-third of alcohol sales (Nelson et al., 2010); therefore, the binge drinking prevalence estimates in this study are likely conservative. The estimated prevalence of binge drinking among currently employed adults during this study period would likely be higher if estimated using a different national survey, such as the National Survey of Drug Use and Health, due to differences in survey methodology (Frone, 2019; Miller et al., 2004; Grucza et al., 2018). Third, the method for assessing the total binge drinks per binge drinker could lead to overestimates because a measure of the average largest number of drinks consumed on an occasion is used for assessing binge drinking intensity, and then the binge drinking intensity is multiplied by the annual number of binge drinking episodes – calculated by multiplying self-reported monthly binge drinking frequency by 12 (Kanny et al., 2015). While binge drinkers' largest number of drinks consumed on an occasion has been found to strongly correlate with the total number of drinks consumed during their most recent binge drinking episode (Esser et al., 2012), the largest number of drinks consumed on an occasion during the past 30 days among binge drinkers may be greater than the average number of drinks consumed during binge drinking episodes throughout the past year.

Fourth, the BRFSS I&O module is not administered by all states so the data used in this study are not nationally representative; nor are they necessarily representative of all people in the occupations and industries analyzed. However, data from highly populous and geographically diverse states including California, New York, Illinois, and Florida, were included in this study. Fifth, this study was not able to examine reasons for the differences in binge drinking across occupation groups, such as whether differences were due to work settings, the composition of the workforces (e.g., by gender, age, or personality types), or both. Finally, the BRFSS alcohol consumption questions do not capture information on alcohol consumed while at work, which could put people at increased risk for occupational injuries.

### Conclusions

One in five currently employed U.S. adults from the 32 states that collected I&O data report binge drinking during the previous month, and on average, report doing so almost weekly, at levels that far exceed the binge drinking threshold. This study identified disparities in binge drinking among workers from different occupation groups. Binge drinking was high among construction and extraction; legal; and food preparation and serving workers. Given

that nearly 70% of alcohol-attributable deaths are among working age adults (Stahre et al., 2014), and that excessive alcohol use contributes to productivity losses (McFarlin & Fals-Stewart, 2002; Larson et al., 2007), the findings from this study can help inform the targeting of resources to occupation groups with high binge drinking prevalence estimates to improve occupational safety and health.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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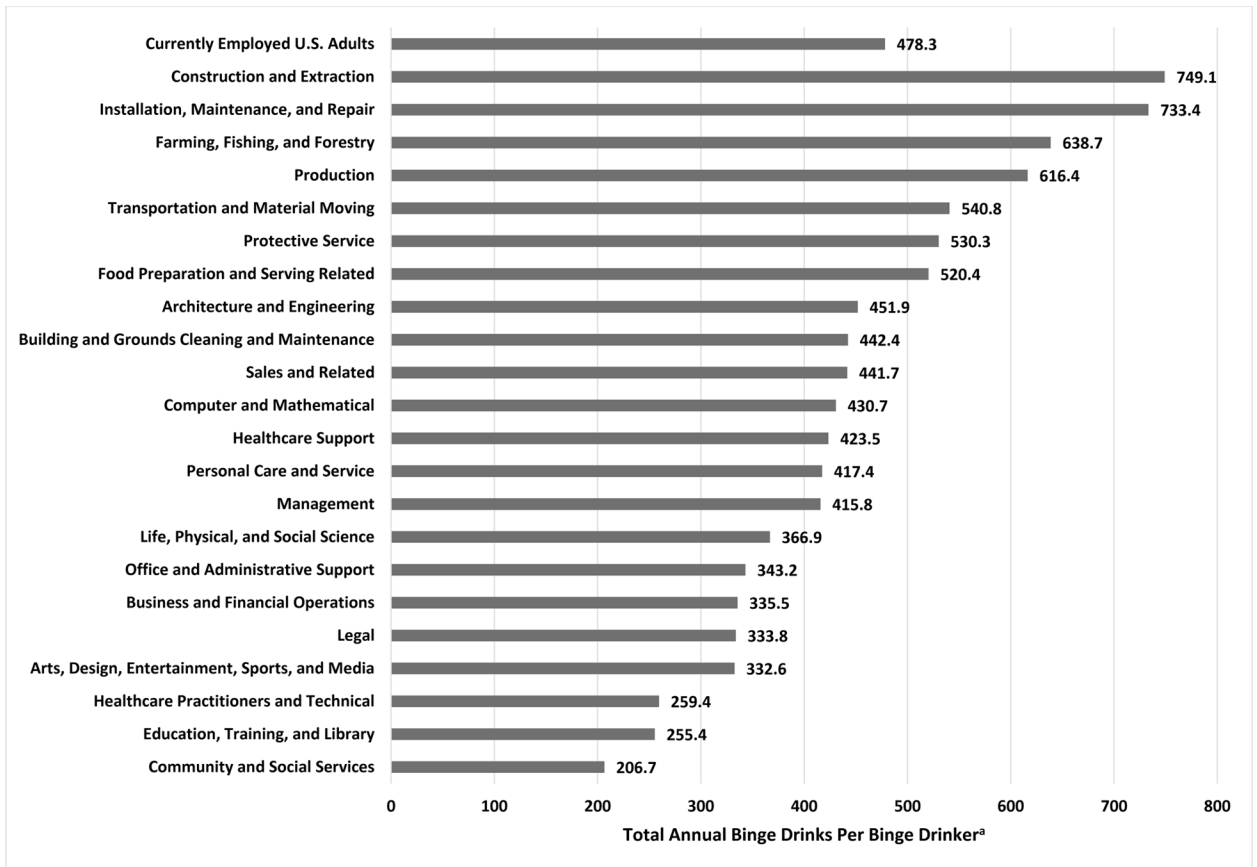
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**Figure 1. Total Binge Drinks Per Binge Drinker by 22 Standard Occupational Classification (SOC) Major Occupation Groups – Behavioral Risk Factor Surveillance System, 32 States, 2013–2016.**

<sup>a</sup> Total annual binge drinks per binge drinker was calculated by dividing total annual binge drinks by the weighted total population of binge drinkers

**Table 1.** Binge Drinking<sup>a</sup> Measures by Sociodemographic Characteristics among Employed U.S. Adults<sup>b</sup> from 32 States<sup>c</sup>, BRFSS, 2013–2016

Socio-demographic Characteristics	Study Sample		Binge Drinking							
	n	Weighted % of total sample population (95% CI)	Prevalence weighted % (95% CI)	Unweighted No. of binge drinkers	Weighted No. of binge drinkers	Annual Frequency <sup>d</sup>	Total Annual Binge Drinking Episodes <sup>e</sup>	Intensity <sup>f</sup>	Total Annual Binge Drinks <sup>g</sup>	Total Annual Binge Drinks Per Binge Drinker <sup>h</sup>
<b>Currently Employed Adults</b>	358,355	100.0	20.8 (20.4 – 21.2)	65,073	14,920,894	48.7	804,308,596	7.4	7,456,144,196	478.3
<b>Sex</b>										
Male	172,321	54.2 (53.8 – 54.7)	25.6 (25.0 – 26.1)	40,207	9,964,280	53.7	591,990,623	8.3	6,044,341,412	581.4
Female	186,030	45.8 (45.3 – 46.2)	15.1 (14.6 – 15.5)	24,866	4,956,614	38.7	212,258,244	5.5	1,411,205,490	271.7
<b>Age Group (years)</b>										
18–24	19,457	10.4 (10.1 – 10.8)	28.9 (27.4 – 30.4)	6,115	2,161,080	48.9	124,379,510	8.7	1,381,836,222	585.4
25–34	49,607	20.9 (20.5 – 21.3)	29.8 (28.8 – 30.8)	14,505	4,474,107	45.6	233,950,912	7.9	2,263,211,220	464.0
35–44	64,025	21.7 (21.3 – 22.1)	21.4 (20.6 – 22.2)	14,088	3,337,677	47.9	174,277,429	7.2	1,634,001,759	474.3
45–54	89,748	23.7 (23.3 – 24.1)	18.0 (17.3 – 18.6)	16,170	3,060,788	50.3	163,675,638	6.6	1,367,728,944	449.5
55	135,518	23.3 (22.9 – 23.6)	11.3 (10.7 – 11.9)	14,195	1,887,242	54.6	108,025,108	6.2	809,366,050	434.1
<b>Race/Ethnicity</b>										
White, non-Hispanic	285,294	64.5 (64.0 – 65.0)	22.3 (21.9 – 22.7)	53,500	10,175,198	50.4	568,745,920	7.5	5,372,449,129	498.6
Black, non-Hispanic	22,351	10.8 (10.5 – 11.1)	15.1 (14.0 – 16.2)	2,688	1,152,038	49.4	62,887,953	6.1	461,383,003	398.6
Other Race or Multiracial, non-Hispanic	26,360	16.0 (15.6 – 16.5)	22.1 (20.8 – 23.4)	5,091	2,505,207	40.1	52,328,445	7.4	490,468,165	519.6
Hispanic	19,783	8.6 (8.2 – 9.0)	14.7 (13.3 – 16.1)	3,127	898,780	51.5	109,090,188	7.7	1,023,642,555	406.1
<b>Education</b>										
< High school	15,365	10.0 (9.7 – 10.3)	20.9 (19.3 – 22.4)	2,956	1,495,959	57.8	94,823,044	8.5	1,027,925,701	697.8
High school degree	83,456	24.9 (24.5 – 25.3)	22.4 (21.6 – 23.2)	16,732	3,990,295	54.8	239,804,608	8.0	2,389,593,822	588.8
Some college	99,454	31.4 (30.9 – 31.9)	21.5 (20.7 – 22.2)	18,741	4,834,825	50.8	266,116,862	7.4	2,417,262,422	487.1
College degree	159,586	33.7 (33.3 – 34.1)	19.0 (18.5 – 19.5)	26,593	4,587,559	38.3	202,990,042	6.5	1,616,844,460	318.1
<b>Marital Status</b>										

Socio-demographic Characteristics	Study Sample		Binge Drinking							
	n	Weighted % of total sample population (95% CI)	Prevalence weighted % (95% CI)	Unweighted No. of binge drinkers	Weighted No. of binge drinkers	Annual Frequency <sup>d</sup>	Total Annual Binge Drinking Episodes <sup>e</sup>	Intensity <sup>f</sup>	Total Annual Binge Drinks <sup>g</sup>	Total Annual Binge Drinks Per Binge Drinker <sup>h</sup>
Not married	128,739	38.7 (38.2 – 39.2)	24.3 (23.6 – 24.9)	26,672	6,719,667	54.1	410,110,337	7.9	4,021,793,202	566.2
Married/member of an unmarried couple	228,167	61.3 (60.8 – 61.8)	18.6 (18.1 – 19.1)	38,220	8,161,867	44.2	392,085,397	7.0	3,414,898,366	404.4
<b>Health Insurance Coverage</b>										
Does not have health care coverage	32,759	13.1 (12.8 – 13.4)	25.2 (24.1 – 26.4)	7,396	2,366,026	56.6	149,125,822	8.5	1,542,827,418	643.1
Has health care coverage	324,708	86.9 (86.6 – 87.2)	20.1 (19.7 – 20.5)	57,498	12,511,759	47.2	652,535,310	7.2	5,883,882,773	447.5
<b>Annual Household Income</b>										
< \$25,000	46,989	18.1 (17.7 – 18.5)	20.0 (19.1 – 21.0)	8,149	2,378,106	50.4	134,208,171	7.8	1,273,011,957	513.9
\$25,000 – \$49,999	75,516	22.9 (22.5 – 23.3)	21.8 (20.9 – 22.6)	13,701	3,258,060	51.6	186,382,040	7.5	1,744,364,166	512.6
\$50,000 – \$74,999	60,654	16.9 (16.5 – 17.2)	21.5 (20.5 – 22.5)	11,130	2,369,742	53.2	137,059,531	7.8	1,365,050,438	539.8
\$75,000	143,551	42.1 (41.6 – 42.6)	21.6 (21.0 – 22.2)	28,067	5,950,299	44.9	294,715,099	7.0	2,609,375,081	417.6

Abbreviations: BRFSS = Behavioral Risk Factor Surveillance System; CI = Confidence Interval; No. = Number

<sup>a</sup> Binge drinking is defined as men consuming five or more alcoholic drinks per drinking occasion, or women consuming four or more alcoholic drinks per occasion

<sup>b</sup> All currently employed adults ( 18 years) from the 32 states that administered the BRFSS industry and occupation module who are not missing information on binge drinking or occupation, and who are not included in the military active duty or retired/unpaid/disabled occupation groups

<sup>c</sup> 32 states administered the BRFSS industry and occupation module in 2013, 2014, 2015 and/or 2016: California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oregon, Tennessee, Utah, Vermont, Washington, West Virginia, Wisconsin, Wyoming (by year in Supplementary Table 1)

<sup>d</sup> Average annual number of binge drinking episodes reported by binge drinkers

<sup>e</sup> Total number of annual binge drinking episodes was calculated by summing the annual number of binge drinking episodes among all binge drinkers

<sup>f</sup> Average largest number of drinks consumed by binge drinkers on any occasion during the past 30 days

<sup>g</sup> Total annual binge drinks was calculated by multiplying the frequency of binge drinking (i.e. total annual number of binge drinking episodes) by the binge drinking intensity of each binge drinker (i.e. largest number of drinks consumed by binge drinkers on any occasion)

Total annual binge drinks per binge drinker was calculated by dividing total annual binge drinks by the weighted total population of binge drinkers

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**Table 2.** Binge Drinking<sup>a</sup> Measures by Major Occupation Groups<sup>b</sup> among Employed U.S. Adults<sup>c</sup> from 32 states<sup>d</sup>, BRFSS, 2013–2016

Major Occupation Group	Adjusted <sup>e</sup> Prevalence % (95% CI)	Unadjusted Prevalence % (95% CI)	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Frequency <sup>f</sup>	Total Annual Binge Drinking Episodes <sup>g</sup>	Intensity <sup>h</sup>	Total Annual Binge Drinks <sup>i</sup>
Construction and Extraction	26.3 (24.5 – 28.1)	32.0 (30.0 – 34.0)	5,720	1,544,970	63.7	98,364,131	9.2	1,087,526,824
Legal	23.9 (20.5 – 27.7)	22.3 (18.6 – 26.0)	923	203,225	41.4	8,412,950	6.4	66,449,400
Food Preparation and Serving Related	23.7 (21.8 – 25.7)	26.3 (24.1 – 28.3)	2,612	793,563	52.3	41,498,965	7.7	392,330,075
Farming, Fishing, and Forestry	23.0 (18.6 – 28.1)	25.1 (19.8 – 30.5)	761	179,424	49.7	8,917,122	9.4	108,071,202
Business and Financial Operations	22.6 (20.8 – 24.4)	20.4 (18.7 – 22.1)	2,716	578,790	40.3	23,329,700	6.6	187,403,788
Management	22.4 (21.2 – 23.5)	22.1 (20.9 – 23.2)	8,479	1,578,704	46.1	72,731,008	7.1	632,230,508
Installation, Maintenance, and Repair	21.8 (20.0 – 23.8)	26.8 (24.7 – 28.9)	2,937	741,756	64.2	47,600,515	8.9	509,859,753
Production	21.8 (20.1 – 23.7)	23.7 (21.8 – 25.6)	3,441	811,672	55.5	45,064,062	8.5	480,584,500
Sales and Related	21.6 (20.4 – 22.8)	22.4 (21.2 – 23.7)	6,529	1,600,950	47.9	76,627,177	7.2	672,054,697
Arts, Design, Entertainment, Sports, and Media	21.4 (19.0 – 23.9)	21.1 (18.6 – 23.6)	1,335	345,205	37.6	12,967,768	6.8	106,634,137
Life, Physical, and Social Science	20.8 (18.1 – 23.9)	20.4 (17.7 – 23.2)	1,134	198,041	43.4	8,585,459	6.7	70,544,727
Transportation and Material Moving	20.5 (19.1 – 22.1)	22.2 (20.6 – 23.8)	3,445	926,010	51.0	47,226,703	8.3	463,790,314
Personal Care and Service	20.1 (17.8 – 22.6)	17.6 (15.4 – 19.8)	1,678	448,707	50.0	22,437,708	6.4	173,005,788
Building and Grounds Cleaning and Maintenance	20.0 (18.1 – 22.1)	19.5 (17.5 – 21.4)	2,321	633,460	47.9	30,340,974	7.7	262,752,059
Office and Administrative Support	20.0 (18.8 – 21.3)	17.1 (16.0 – 18.2)	5,963	1,319,381	42.6	56,239,088	6.4	434,592,813
Architecture and Engineering	19.5 (18.0 – 21.2)	21.8 (19.9 – 23.6)	2,008	403,511	47.6	19,187,669	7.3	176,312,570
Education, Training, and Library	17.3 (16.0 – 18.6)	14.9 (13.7 – 16.1)	3,690	646,167	35.8	23,112,364	5.9	158,068,229

Major Occupation Group	Adjusted <sup>e</sup> Prevalence % (95% CI)	Unadjusted Prevalence % (95% CI)	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Frequency <sup>f</sup>	Total Annual Binge Drinking Episodes <sup>g</sup>	Intensity <sup>h</sup>	Total Annual Binge Drinks <sup>i</sup>
Healthcare Practitioners and Technical	17.3 (16.1 – 18.6)	14.3 (13.2 – 15.4)	3,860	732,727	36.2	26,514,843	5.9	180,344,296
Protective Service	17.1 (15.1 – 19.2)	19.6 (17.2 – 21.9)	1,392	331,256	50.3	16,667,776	7.7	169,441,342
Healthcare Support	17.0 (15.2 – 19.0)	14.6 (13.0 – 16.3)	1,217	276,887	47.3	13,097,723	6.5	111,532,763
Computer and Mathematical	16.4 (14.6 – 18.3)	18.0 (16.0 – 20.0)	1,955	451,147	49.5	22,309,407	6.7	186,268,412
Community and Social Services	15.9 (13.5 – 18.6)	13.7 (11.2 – 16.2)	957	175,342	30.0	5,261,804	6.0	35,224,757

Abbreviations: BRFSS = Behavioral Risk Factor Surveillance System; No. = Number; CI = Confidence Interval

<sup>a</sup> Binge drinking defined as women consuming four or more alcoholic drinks, and men consuming five or more alcoholic drinks per drinking occasion

<sup>b</sup> Major occupation groups are based on the 22 Standard Occupational Classification (SOC) System 2-digit codes

<sup>c</sup> All currently employed adults ( 18 years) from the 32 states that administered the BRFSS industry and occupation module who are not missing information on binge drinking or occupation, and who are not included in the military active duty or retired/unpaid/disabled occupation groups

<sup>d</sup> 32 states administered the BRFSS industry and occupation module in 2013, 2014, 2015 and/or 2016: California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oregon, Tennessee, Utah, Vermont, Washington, West Virginia, Wisconsin, Wyoming (by year in Supplementary Table 1)

<sup>e</sup> Adjusted for sex, race/ethnicity, and age

<sup>f</sup> Average, annual number of binge-drinking episodes reported by binge drinkers

<sup>g</sup> Total number of annual binge drinking episodes was calculated by summing the annual number of binge drinking episodes among all binge drinkers

<sup>h</sup> Average largest number of drinks consumed by binge drinkers on any occasion during the past 30 days

<sup>i</sup> Total annual binge drinks was calculated by multiplying the frequency of binge drinking (i.e. total annual number of binge drinking episodes) by the binge drinking intensity of each binge drinker (i.e. largest number of drinks consumed by binge drinkers on any occasion)

Table 3.

Binge Drinking<sup>a</sup> Prevalence by Detailed Occupation Groups among Employed U.S. Adults<sup>b</sup> from 32 States<sup>c</sup>, BRFSS, 2013–2016

Major Occupation Group <sup>d</sup>	Detailed Occupation Group <sup>e</sup>	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Unadjusted Prevalence % (95% CI)	Adjusted <sup>f</sup> Prevalence % (95% CI)
Management	Advertising, marketing, promotions, public relations, and sales managers	640	160,739	29.8 (25.2 – 34.9)	28.8 (24.6 – 33.4)
	Other management occupations	5,511	989,443	21.7 (20.3 – 23.2)	22.1 (20.7 – 23.5)
	Operations specialties managers	1,306	260,258	21.4 (19.2 – 23.8)	21.7 (19.4 – 24.2)
	Chief, executives; general and operations managers; legislators	1,022	168,263	19.7 (17.1 – 22.6)	20.3 (17.3 – 23.7)
Business and Financial Operations	Financial specialists	1,400	295,079	20.4 (17.9 – 23.1)	22.6 (20.0 – 25.4)
	Business operations specialists	1,316	283,711	20.4 (18.3 – 22.7)	22.4 (20.1 – 24.8)
Computer and Mathematical	Mathematical science occupations	71	12,797	*15.1 (9.9 – 22.3)	17.0 (11.5 – 24.4)
	Computer specialists	1,884	438,351	18.1 (16.1 – 20.3)	16.4 (14.6 – 18.4)
Architecture and Engineering	Drafters, engineering, and mapping technicians	366	77,606	23.1 (18.6 – 28.3)	21.4 (17.4 – 26.1)
	Architects, surveyors, and cartographers	167	33,660	20.9 (15.7 – 27.3)	20.1 (15.2 – 26.0)
	Engineers	1,475	292,245	21.6 (19.5 – 23.7)	19.1 (17.3 – 21.0)
Life, Physical, and Social Science	Life, physical, and social science technicians	220	48,962	26.1 (20.6 – 32.6)	25.0 (19.9 – 30.9)
	Physical scientists	296	56,578	21.5 (14.9 – 29.9)	20.7 (14.0 – 29.6)
	Social scientists and related workers	310	52,087	17.9 (14.5 – 22.0)	19.6 (16.0 – 23.8)
	Life scientists	308	40,414	17.7 (14.4 – 21.5)	18.4 (15.2 – 22.0)

Major Occupation Group <sup>d</sup>	Detailed Occupation Group <sup>e</sup>	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Unadjusted Prevalence % (95% CI)	Adjusted <sup>f</sup> Prevalence % (95% CI)
Community and Social Service	Counselors, social workers, and other community and social service specialists	908	166,803	16.0 (13.2 – 19.1)	18.8 (15.9 – 21.9)
	Religious workers	49	8,539	<i>†</i>	<i>†</i>
Legal	Legal support workers	241	71,430	24.3 (16.9 – 33.7)	27.6 (20.2 – 36.5)
	Lawyers, judges, and related workers	682	131,795	21.3 (17.9 – 25.2)	21.9 (18.6 – 25.6)
Education, Training, and Library	Other teachers and instructors	172	50,219	*19.9 (13.1 – 29.1)	21.0 (14.6 – 29.2)
	Other education, training, and library occupations	362	77,153	14.3 (11.3 – 17.9)	18.9 (15.2 – 23.3)
	Primary, secondary, and special education school workers	2,566	421,673	15.1 (13.7 – 16.6)	17.1 (15.5 – 18.8)
	Postsecondary teachers	509	83,707	13.8 (11.6 – 16.3)	16.0 (13.6 – 18.7)
	Librarians, curators, and archivists	81	13,414	*9.4 (6.1 – 14.2)	12.0 (8.1 – 17.5)
Arts, Design, Entertainment, Sports, and Media	Media and communication equipment workers	158	68,832	30.6 (21.3 – 41.8)	25.6 (17.9 – 35.1)
	Art and design workers	486	113,116	18.7 (15.3 – 22.6)	20.8 (17.1 – 25.0)
	Media and communication workers	390	75,517	18.8 (15.6 – 22.5)	20.5 (17.2 – 24.1)
	Entertainers and performers, sports and related workers	301	87,740	21.8 (17.5 – 26.8)	19.8 (16.1 – 24.2)
Healthcare Practitioners and Technical	Other healthcare practitioners and technical occupations	69	11,590	*20.8 (12.1 – 33.4)	*20.3 (11.5 – 33.3)
	Health technologists and technicians	999	211,843	17.0 (14.8 – 19.4)	18.6 (16.4 – 21.1)
	Health diagnosing and treating practitioners	2,792	509,294	13.3 (12.1 – 14.6)	16.8 (15.4 – 18.3)

Major Occupation Group <sup>d</sup>	Detailed Occupation Group <sup>e</sup>	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Unadjusted Prevalence % (95% CI)	Adjusted <sup>f</sup> Prevalence % (95% CI)
<b>Healthcare Support</b>					
	Other healthcare support occupations	516	126,018	16.7 (14.0 – 19.9)	18.2 (15.3 – 21.5)
	Nursing, psychiatric, and home health aides	652	140,145	12.9 (11.0 – 14.9)	15.8 (13.5 – 18.4)
	Occupational and physical therapist assistants and aides	49	10,723	<sup>†</sup>	<sup>†</sup>
<b>Protective Service</b>					
	Firefighting and prevention workers	304	77,636	30.1 (25.0 – 35.8)	23.3 (19.4 – 27.8)
	Law enforcement officers	637	142,066	18.7 (15.0 – 23.0)	16.4 (13.2 – 20.1)
	Other protective service workers	360	97,289	16.8 (13.7 – 20.5)	15.5 (12.5 – 19.0)
	First-line supervisors/managers, protective service workers	91	14,264	14.6 (9.9 – 21.0)	*13.9 (9.0 – 20.8)
<b>Food Preparation and Serving Related</b>					
	Food and beverage serving workers	1,089	318,570	30.3 (26.7 – 34.1)	28.0 (24.7 – 31.5)
	Supervisors, food preparation, and serving workers	480	146,774	28.1 (23.1 – 33.7)	24.6 (20.4 – 29.3)
	Cooks and food preparation workers	874	264,167	22.9 (19.8 – 26.4)	21.0 (18.1 – 24.2)
	Other food preparation and serving related workers	169	64,052	21.7 (16.7 – 27.7)	18.7 (14.2 – 24.2)
<b>Building and Grounds Cleaning and Maintenance</b>					
	Grounds maintenance workers	602	240,565	30.6 (25.1 – 36.6)	25.7 (20.5 – 31.7)
	Supervisors, building and grounds cleaning and maintenance workers	198	32,268	23.0 (18.7 – 28.1)	22.6 (18.4 – 27.6)
	Building cleaning and pest control workers	1,521	360,626	15.5 (13.9 – 17.2)	17.4 (15.7 – 19.3)
<b>Personal Care and Service</b>					
	Personal appearance workers	353	102,250	20.8 (16.8 – 25.4)	23.9 (19.7 – 28.6)
	Transportation, tourism, and lodging attendants	92	22,254	*20.5 (12.7 – 31.5)	*18.8 (11.9 – 28.5)
	Other personal care and service workers	993	248,936	15.2 (13.0 – 17.6)	18.3 (15.8 – 21.0)

Major Occupation Group <sup>d</sup>	Detailed Occupation Group <sup>e</sup>	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Unadjusted Prevalence % (95% CI)	Adjusted <sup>f</sup> Prevalence % (95% CI)
	Supervisors, personal care and service workers	55	8,308	*16.7 (10.8 – 24.8)	*18.2 (11.8 – 27.2)
	Animal care and service workers	97	21,793	19.0 (13.6 – 26.0)	17.7 (12.1 – 25.2)
	Entertainment attendants and related workers	85	43,600	†	†
	Funeral service workers	<5	1,585	†	†
<b>Sales and Related</b>					
	Sales representatives, services	1,054	263,579	29.2 (25.5 – 33.2)	28.6 (25.0 – 32.4)
	Sales representatives, wholesale and manufacturing	702	138,732	27.4 (23.6 – 31.6)	26.1 (22.6 – 29.9)
	Other sales and related workers	860	210,586	22.7 (19.1 – 26.7)	24.3 (20.7 – 28.5)
	Supervisors, sales workers	1,333	261,965	20.3 (17.9 – 22.9)	19.8 (17.3 – 22.5)
	Retail sales workers	2,580	726,087	20.7 (18.9 – 22.6)	19.1 (17.5 – 20.8)
<b>Office and Administrative Support</b>					
	Supervisors, office and administrative support workers	662	122,129	16.5 (14.1 – 19.2)	20.9 (18.2 – 23.9)
	Other office and administrative support workers	1,327	288,197	17.0 (14.6 – 19.7)	20.6 (18.0 – 23.6)
	Financial clerks	879	185,599	15.9 (13.3 – 18.8)	20.5 (17.2 – 24.2)
	Material recording, scheduling, dispatching, and distribution workers	880	235,587	20.7 (17.6 – 24.1)	20.2 (17.2 – 23.6)
	Secretaries and administrative assistants	830	157,935	13.7 (11.8 – 15.8)	19.1 (16.6 – 21.8)
	Information and record clerks	1,358	315,911	17.8 (15.8 – 20.0)	19.0 (16.8 – 21.4)
	Communications equipment operators	27	14,023	†	†
<b>Farming, Fishing, and Forestry</b>					
	Forest, conservations, and logging workers	104	18,866	*29.7 (18.4 – 44.1)	27.3 (18.5 – 38.3)
	Agricultural workers	568	139,410	24.1 (18.5 – 30.8)	22.1 (17.0 – 28.2)
	Supervisors, farming, fishing, and forestry workers	33	7,392	†	†

Major Occupation Group <sup>d</sup>	Detailed Occupation Group <sup>e</sup>	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Unadjusted Prevalence % (95% CI)	Adjusted <sup>f</sup> Prevalence % (95% CI)
	Fishing and hunting workers	56	13,756	‡	‡
Construction and Extraction	Extraction workers	328	62,362	*44.0 (27.8 – 61.5)	*37.1 (19.6 – 58.9)
	Construction trades workers	4,475	1,294,880	32.1 (30.0 – 34.2)	26.2 (24.3 – 28.2)
	Other construction and related workers	271	55,947	28.1 (22.4 – 34.6)	24.4 (19.1 – 30.5)
	Supervisors, construction and extraction workers	641	130,387	‡	‡
	Helpers, constructions trades	5	1,395	‡	‡
Installation, Maintenance, and Repair	Other installation, maintenance, and repair occupations	1,110	291,614	29.5 (26.1 – 33.1)	25.5 (22.5 – 28.6)
	Vehicle and mobile equipment mechanics, installers, and repairers	1,387	327,892	26.1 (23.1 – 29.3)	20.3 (17.6 – 23.3)
	Electrical and electronic equipment mechanics, installers, and repairers	335	103,647	24.1 (19.0 – 30.1)	19.5 (15.2 – 24.5)
	Supervisors of installation, maintenance, and repair workers	105	18,603	*20.0 (12.5 – 30.5)	*19.2 (12.5 – 28.3)
Production	Supervisors, productions workers	280	80,966	35.5 (23.4 – 49.8)	31.6 (20.9 – 44.6)
	Food processing workers	234	72,146	25.8 (20.0 – 32.6)	24.2 (18.6 – 30.7)
	Printing workers	114	23,008	24.9 (18.1 – 33.1)	23.9 (17.3 – 32.0)
	Other productions occupations	1,198	307,621	24.2 (21.2 – 27.6)	23.3 (20.2 – 26.7)
	Metal workers and plastic workers	830	171,731	26.7 (23.8 – 29.8)	22.4 (19.9 – 25.2)
	Plant and system operators	259	50,595	23.2 (18.1 – 29.3)	20.3 (15.8 – 25.8)
	Assemblers and fabricators	330	64,255	17.5 (14.5 – 21.0)	16.3 (13.4 – 19.6)
	Textile, apparel, and furnishings workers	137	28,330	11.5 (7.9 – 16.4)	13.4 (9.2 – 19.2)
	Woodworkers	59	13,022	*15.9 (9.3 – 25.9)	*13.4 (7.7 – 22.3)

Major Occupation Group <sup>d</sup>	Detailed Occupation Group <sup>e</sup>	Unweighted No. of Binge Drinkers	Weighted No. of Binge Drinkers	Unadjusted Prevalence % (95% CI)	Adjusted <sup>f</sup> Prevalence % (95% CI)	
Transportation and Material Moving	Water transportation workers (91)	61	14,884	32.5 (22.6 – 44.3)	27.3 (18.2 – 38.7)	
	Air transportation workers (88)	87	25,127	*29.8 (16.7 – 47.3)	*24.5 (14.8 – 37.7)	
	Material moving workers (93)	1,181	357,267	25.9 (22.7 – 29.2)	23.0 (20.0 – 26.2)	
	Supervisors, transportation and material moving employees	65	18,695	*25.2 (15.6 – 37.9)	*22.7 (14.4 – 33.8)	
	Other transportation workers (92)	54	17,050	*23.0 (14.8 – 33.9)	*18.9 (11.7 – 29.0)	
	Motor vehicle operators (89)	1,880	471,911	19.4 (17.7 – 21.4)	18.8 (17.1 20.6)	
	Rail transportation workers	117	21,077	<sup>†</sup>	<sup>†</sup>	

Abbreviations: BRFSS = Behavioral Risk Factor Surveillance System; CI = Confidence Interval; No. = Number

<sup>a</sup> Binge drinking defined as women consuming four or more alcoholic drinks, and men consuming five or more alcoholic drinks per drinking occasion

<sup>b</sup> All currently employed adults ( 18 years) from the 32 states that administered the BRFSS industry and occupation module who are not missing information on binge drinking or occupation, and who are not included in the military active duty or retired/unpaid/disabled occupation groups

<sup>c</sup> 32 states administered the BRFSS industry and occupation module in 2013, 2014, 2015 and/or 2016: California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oregon, Tennessee, Utah, Vermont, Washington, West Virginia, Wisconsin, Wyoming (by year in Supplementary Table 1)

<sup>d</sup> Major occupation groups are based on the 22 Standard Occupational Classification (SOC) System 2-digit codes

<sup>e</sup> 93 Detailed occupation groups are based on National Health Interview Survey occupation recodes which rely on Bureau of Census occupation codes

<sup>f</sup> Adjusted for sex, race/ethnicity, and age

<sup>†</sup> Estimates not shown because the relative standard error 30% or the cell size is less than 50 and do not meet BRFSS standards of reportability

\* Estimates preceded by an asterisk have a relative standard error > 20% and 30% and, therefore, should be used with caution based on BRFSS standards of reliability/precision