

**Sexual Orientation and Substance Abuse Treatment Utilization in the United States:
Results from a National Survey**

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Abstract:

This study examined substance abuse treatment utilization across three dimensions of sexual orientation (identity, attraction, behavior) in a large national sample of adults in the United States. Prevalence estimates were based on data collected from the 2004–2005 National Epidemiologic Survey on Alcohol and Related Conditions. The sample consisted of 34,653 adults aged 20 years and older: 52% women, 71% White, 12% Hispanic, 11% African American, 4% Asian, and 2% other race/ethnicities. Approximately 2% of the sample self-identified as lesbian, gay or bisexual; 4% reported same-sex sexual behavior, and 6% reported same-sex sexual attraction. Sexual minorities, especially women, had a greater likelihood of lifetime substance use disorders and earlier age of drinking onset. The majority of respondents with substance use disorders were untreated and lifetime substance abuse treatment utilization differed based on sexual orientation. Sexual minorities were found to have more extensive family history of substance abuse problems. The findings indicate the underutilization of substance abuse treatment among all adults, and highlight some important factors to consider when working with sexual minorities.

Keywords: Sexual orientation; Epidemiology; Substance use disorders; Substance abuse treatment; Adults

1. Introduction

Over the past several decades researchers have increasingly documented disproportionately high rates of substance use disorders among sexual minority women and men (Cochran et al., 2004; Drabble et al., 2005; McCabe et al., 2009; Russell et al., 2002; Wilsnack et al., 2008). Despite clear disparities in substance use disorders, information regarding substance abuse treatment utilization among sexual minorities in the United States is limited (Bieschke et al., 2000; Cochran et al., 2003; Cochran & Cauce, 2006).

The majority of people with substance use disorders in the United States do not receive treatment and unmet need for treatment is often greatest in traditionally underserved groups (Wang et al., 2005). Sexual minorities face unique barriers when seeking substance abuse treatment, including providers who hold stigmatizing attitudes regarding homosexual behavior or who lack knowledge about sexual minorities and their health needs (e.g., Eliason & Hughes, 2004; Garnets et al., 1991; Hellman, 1996; Hughes, 2011). On the one hand, negative experiences with health care providers may result in the reluctance of some sexual minority individuals to seek substance abuse treatment. On the other hand, it is possible that stereotypical attitudes and beliefs may make some providers *more* likely to refer sexual minority clients to substance abuse treatment.

Sexual orientation disparities in substance abuse treatment utilization may differ by gender. Cochran and colleagues (2000) examined treatment utilization among heterosexual men and women and sexual minorities (defined on the basis of sexual behavior) among adults in the 1996 National Household Survey on Drug Abuse. After adjusting for demographic characteristics, sexual minority women were more likely than heterosexual women to have received treatment in

the past year for alcohol related problems. There were no such differences in treatment utilization for alcohol related problems between homosexually active and heterosexually active men. Similarly, using data from the 2000 National Alcohol Survey, Drabble and colleagues (2005) found that women who identified as lesbian or bisexual were more likely than women who identified as heterosexual but reported no same-sex behavior to seek treatment for alcohol-related problems. In contrast, there were no such differences in help-seeking behaviors for alcohol-related problems between men who identified as gay or bisexual and men who identified as heterosexual, regardless of same-sex behavior. Finally, Grella and colleagues (2009) compared substance abuse treatment utilization of heterosexual and sexual minority respondents in the California Quality of Life Survey. Although these authors found that sexual minorities were more likely to report treatment in the previous year, among participants with a substance use disorder only and those with both a substance use disorder and a mental health disorder, differences in treatment utilization did not differ by sexual orientation.

To date, no large-scale studies of nationally representative samples have examined substance use disorders and substance abuse treatment utilization across the three major dimensions of sexual orientation (identity, attraction and behavior). Despite growing consensus that sexual orientation includes behavioral, affective and cognitive dimensions (Diamond, 2000; Hughes & Eliason, 2002; Laumann et al., 1994), researchers often define and use these terms in an inconsistent manner or only ask a single question to assess sexual orientation. The current study analyzed data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). The NESARC is the first national study to provide data on DSM-IV substance use disorders and substance abuse treatment utilization among sexual minorities in the United States based on

assessment of all three major dimensions of sexual orientation: identity, attraction and behavior. The availability of data that permit comparisons across all three major dimensions of sexual orientation represents an unprecedented opportunity to close gaps in knowledge, as emphasized in the Institute of Medicine Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities report *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding* (IOM, 2011), *Healthy People 2020* (USDHHS, 2010), and the Substance Abuse and Mental Health Services Administration's publication *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals* (SAMHSA, 2001). The main objective of this exploratory study was to examine prevalence of lifetime substance use disorders and lifetime substance abuse treatment utilization across the three major dimensions of sexual orientation in adult women and men in the U.S. In addition, we also examined specific types of substance abuse treatment utilized, as well as two major predictors of SUDs: family history of alcohol and other drug problems and age of drinking onset (Dube et al., 2006; Hingson et al., 2006; Pitkanen et al., 2005).

2. Materials and methods

2.1 Study design

The 2004–2005 NESARC (Wave 2) collected data from a nationally representative sample of the U.S. adult population. The target population for the Wave 2 NESARC was the civilian, noninstitutionalized population in the United States, 20 years of age and older, and the sample

includes individuals who were first interviewed in 2001 and 2002 (Wave 1). Data were collected in face-to-face interviews conducted in respondents' households. The United States Census Bureau trained interviewers using the Alcohol Use Disorder and Associated Disabilities Interview Schedule DSM-IV (AUDADIS-IV). Responses to this fully structured diagnostic interview were entered directly into laptop computers. The response rate for Wave 1 was 81.0%; the response rate among those eligible for Wave 2 was 86.7%, resulting in a cumulative response rate of 70.2% (the product of the response rates from Waves 1 and 2). Sample weights for Wave 2 respondents were calculated to ensure that the weighted sample represented adults who remained in the noninstitutionalized population. Details about the NESARC design and methods are available elsewhere (Dawson et al., 2007; Grant and Kaplan, 2005; Ruan et al., 2008). The United States Census Bureau and the United States Office of Budget and Management approved the NESARC research protocol. The University of Michigan Institutional Review Board approved the current study.

2.2 Measures

Demographic and background characteristics collected in the NESARC included sex, age, race (white, black, Native American, Asian, Hispanic, other), educational level (less than high school, high school, some college or higher), job status (full-time, part-time, not working), income (less than \$19,999, \$20,000–\$34,999, \$35,000–\$69,999, \$70,000 or higher), United States Census geographical region (Northeast, Midwest, South, and West), metropolitan statistical area (MSA; central city in MSA, not in central city in MSA, not in MSA), health insurance coverage (yes, no), and relationship status (married/cohabiting, widowed/separated/divorced, never married).

Sexual orientation was assessed along three major dimensions: sexual identity, sexual attraction, and sexual behavior. Respondents were shown a preprinted response card when asked about their sexual identity: “Which of the categories on the card best describes you?” (1) heterosexual (straight), (2) gay or lesbian, (3) bisexual, or (4) not sure?; their sexual attraction: “People are different in their sexual attraction to other people. Which category on the card best describes your feelings?” (1) only attracted to females, (2) mostly attracted to females, (3) equally attracted to females and males, (4) mostly attracted to males, or (5) only attracted to males; and their sexual behavior: “In your entire life, have you had sex with . . . ?” (1) only males, (2) only females, (3) both males and females, or (4) never had sex.

Lifetime substance use disorders were assessed using DSM-IV criteria from the AUDADIS-IV, which contains questions used to operationalize DSM-IV abuse and dependence symptoms separately for 10 substances (alcohol, marijuana, cocaine, hallucinogens, inhalants, heroin, sedatives, tranquilizers, opioids, and stimulants). A lifetime diagnosis of alcohol abuse requires the absence of a diagnosis of alcohol dependence and the endorsement of at least one of four DSM-IV abuse criteria. A lifetime alcohol dependence diagnosis is based on presence of at least three of the seven DSM-IV criteria. The diagnoses of abuse and dependence for each of the other nine individual drugs use criteria similar to those for alcohol abuse and dependence. Reliability and validity of the lifetime and past-year DSM-IV AUDADIS-IV diagnoses of substance use disorder measures have been established in numerous psychometric studies (Grant, 1996; Grant et al., 1995, 2003; Hasin et al., 1996, 1997; Muthen et al., 1993; Nelson et al., 1999; Pull et al., 1997).

Lifetime substance abuse treatment utilization was assessed for all respondents who had a history of alcohol and/or other drug use. Alcohol treatment was defined as seeking help for alcohol-related problems from an agency or from any health professional, including the following: Alcoholics Anonymous or any 12-step meeting; family services or another social service agency; alcohol or drug detoxification ward or clinic; inpatient ward of a psychiatric or general hospital or community mental health program; outpatient clinic, including outreach programs and day or partial patient programs; alcohol or drug rehabilitation program; emergency room for any reason related to drinking; halfway house or therapeutic community; crisis center for any reason related to your drinking; employee assistance program; clergyman, priest, rabbi, or any type of religious counselor for any reason related to your drinking; or private physician, psychiatrist, psychologist, social worker, or any other professional. The response scale for all items was dichotomous (yes / no). Respondents were also asked a separate series of questions related to drug treatment that paralleled the questions related to alcohol treatment.

History of alcohol problems in the home was assessed by asking respondents whether a parent or other adult living in their home was a problem drinker or alcoholic before they were age 18 (yes, no). *History of other drug problems* in the home was assessed using the same language and response options, but with reference to drugs other than alcohol. *Age of drinking onset* was measured by asking respondents how old they were when they first started drinking, not counting small tastes or sips of alcohol. The test-retest intraclass correlation coefficient associated with age of first use of alcohol was 0.72 (Grant et al., 1995).

2.3 Data analysis

The NESARC sample design involved stratification of the target population, and cluster sampling within the defined strata. In addition, sampling weights were computed for Wave 2 respondents to offset unequal probabilities of selection, differential non-response, and additional post-stratification of the population. All analytic techniques in the current study were therefore design-based, using sampling weights to calculate unbiased estimates of population parameters and specialized variance estimation techniques (e.g., Taylor Series Linearization) to accommodate the complex design features of the sample. To estimate the lifetime prevalence of DSM-IV substance use disorders and substance abuse treatment utilization across the three sexual orientation dimensions, we estimated weighted proportions of each dimension-specific subgroup indicating (a) lifetime substance use disorders and substance abuse treatment utilization for alcohol and other drugs, (b) each individual type of substance abuse treatment utilization (for the subpopulation of individuals indicating past substance use), (c) family history of alcohol and other drug problems, and (d) age of drinking onset. Design-based estimates of standard errors for the estimated proportions were computed using Taylor Series Linearization, allowing for the calculation of 95% confidence intervals (CI) for the proportions.

To assess whether sexual orientation was significantly associated with substance use disorders and substance abuse treatment utilization, both bivariate and multivariate analyses were conducted. Initial bivariate analyses used design-based Rao-Scott chi-square tests (Rao and Scott, 1984) to examine the associations of each of the three dimensions of sexual orientation and other demographic or background factors (i.e., race, age, educational level, income,

employment status, relationship status, health insurance status, geographical region, family history of alcohol and drug problems, and age of drinking onset) with the substance use outcomes. Demographic and other background variables that had bivariate associations with the outcomes approaching significance ($p < 0.25$) were included as covariates in design-based logistic regression models, per recommendations of Hosmer and Lemeshow (2000). Methods appropriate for subclass analyses were used in analyses restricted to specific subgroups (e.g., those with a history of substance use) (Cochran, 1977; West, 2008). Analyses were performed using the SUDAAN statistical software package (Version 10.0.1), which includes analytic procedures specifically designed for the analysis of complex sample survey data.

2.4 Sample

The final sample consisted of 34,643 adults aged 20 years and older. After applying sampling weights, the sample represented a population that was approximately 52% women, 71% White, 11% African American, 4% Asian, 12% Hispanic, and 2% Native American or other racial groups. Approximately 2% of the target population was estimated to identify as lesbian, gay, or bisexual; an estimated 6% report same-sex sexual attraction; and an estimated 4% report same-sex sexual behavior. Table 1 summarizes sexual orientation distributions for women and men.

--Please insert Table 1 about here--

3. Results

3.1 Substance use disorders by sexual orientation

Table 2 presents weighted prevalence estimates of lifetime substance use disorders among women and men based on sexual identity, attraction and behavior. In the bivariate analyses focusing on women, significant differences were found between subgroups of women based on all three sexual orientation dimensions in the prevalence of lifetime alcohol use disorders, lifetime drug use disorders and any lifetime substance use disorders ($p < 0.001$). Although differences were found in some of the bivariate comparisons of subgroups of male participants along each of the three sexual orientation dimensions, such differences tended to be smaller and less consistent than those for women.

--Please insert Table 2 about here--

Table 3 shows estimates of adjusted odds ratios (AORs) from 18 separate logistic regression models for substance use disorders across the three sexual orientation dimensions after controlling for other demographic and background factors. The odds of all three substance use disorder outcomes were significantly greater for non-heterosexual women, based on all three dimensions, than for heterosexual women. For example, when holding other demographic and background factors fixed, lesbian women had more than three times greater odds of lifetime alcohol use disorder and of any lifetime substance use disorder than did heterosexual women. In contrast, the odds of lifetime alcohol use disorders for men did not differ, regardless of the sexual orientation measure, but differences did exist for lifetime drug use disorders. For example, men who identified as gay and bisexual had significantly higher odds of lifetime drug use disorders

(other than alcohol) compared to men identifying as heterosexual. Notably, the odds of lifetime alcohol use disorders for men with histories of only male sex partners were significantly lower than those men who reported only female sex partners.

--Please insert Table 3 about here--

3.2 Substance abuse treatment utilization by sexual orientation

Table 4 presents weighted prevalence estimates of lifetime substance abuse treatment utilization among women and men reporting previous histories of substance use disorders, based on sexual identity, sexual attraction and sexual behavior. Statistically significant differences were found based all three sexual orientation dimensions for women, while fewer differences were found for men. Gender differences in rates of treatment utilization were observed for heterosexual adults regardless of the sexual orientation dimension assessed. In general, heterosexual men were more likely to report substance abuse treatment than were heterosexual women. In contrast very few gender differences were observed for sexual minority adults.

--Please insert Table 4 about here--

Table 5 presents estimates of AORs from six separate logistic regression models for substance abuse treatment across the three sexual orientation dimensions. The odds of substance use treatment utilization for sexual minority women and men, regardless of sexual orientation dimension, tended to be greater compared to heterosexual women and men. This was especially

true for respondents who reported bisexual identity or behavior. Women and men who identified as bisexual or who reported sexual behavior with both women and men had more than two times greater odds of lifetime substance abuse treatment utilization than those who identified as heterosexual.

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3.3 Specific types of substance abuse treatment utilization by sexual orientation

Next, we examined prevalence estimates for specific types of lifetime substance abuse treatment utilization among women and men reporting a history of substance use disorders. As illustrated in Tables 6-8, the most common type of substance abuse treatment among those with lifetime substance use disorders was attending a 12-step meeting, followed by seeing a physician, psychiatrist, psychologist or social worker, and alcohol or drug rehabilitation.

In bivariate analyses, significant differences in types of treatment were found among subgroups based on sexual identity and sexual behavior. Smaller differences were found among subgroups based on sexual attraction. Prevalence estimates tended to be lowest for heterosexual adults and highest among non-heterosexual adults, especially bisexuals based on identity and behavior. For example, 22.5% of those with lifetime substance use disorders who identified as bisexual had attended a 12-step meeting compared to only 10.9% of those who identified as heterosexual. Similarly, 21.1% of those with a lifetime substance use disorder who identified as bisexual had

seen a physician, psychiatrist, psychologist or social worker compared to only 7.5% of those who identified as heterosexual.

--Please insert Tables 6-8 about here--

3.4 Family history of alcohol and other drug problems and age of drinking onset

To better understand potential reasons for sexual orientation differences in prevalence of substance use disorders and treatment utilization, we examined and compared the weighted prevalence estimates of family history of alcohol and other drug problems and age of onset of alcohol use across the three sexual orientation dimensions (results not shown, and available upon request). In general, the prevalence of family history of alcohol and other drug problems was higher among non-heterosexual adults across all three sexual orientation dimensions. In the bivariate analyses, significant sexual orientation differences were found based on all three dimensions for women, but fewer differences were found for men.

Results of logistic regression models examining family history of alcohol and other drug problems indicated that the odds of family history of alcohol or other drug problems tended to be significantly higher among sexual minorities than among heterosexuals, and this was especially true for bisexual adults defined on the basis of identity and behavior. For example, both women and men who reported bisexual behavior had at least two times greater odds of family histories of alcohol or other drug problems than those who reported only opposite sex behavior.

In analyses examining the estimated mean ages of drinking onset we found that sexual minority women, whether defined on the basis of identity, behavior or attraction, began drinking at significantly younger mean ages than their heterosexual counterparts (results not shown, and available upon request). For example, women who identified as bisexual had an average age of drinking onset of 16.7 years ($SE = 0.3$) compared with 18.2 years ($SE = 0.1$) for women who identified as heterosexual. No such differences in age of drinking onset were observed for men in the sample.

4. Discussion

4.1 Conclusions

To date, research on the substance abuse treatment needs of sexual minorities in the United States has been limited due to weaknesses in research methodologies (Bieschke et al., 2000; Cochran et al., 2003; Cochran and Cauce, 2006). In the present study, we found that more than 60% of lesbian and bisexual women met the criteria for a lifetime DSM-IV substance use disorder compared to 24% of heterosexual women. Sexual orientation differences among men in the sample were much smaller and less consistent than among women. In addition, we found interesting gender differences across the three dimensions of sexual orientation. In particular, sexual minority women had significantly greater odds of substance use disorders than heterosexual women, regardless of sexual orientation dimension. In contrast, sexual minority men differed from heterosexual men on only a few of the lifetime substance use disorder outcomes. Most notably, we found that the odds of lifetime alcohol use disorders for men with

histories of only male sex partners were significantly lower than those for men who reported only female sex partners.

Our findings are consistent with those of previous studies showing that sexual minorities have higher prevalence and different patterns of substance abuse treatment utilization compared with heterosexuals (Cochran et al., 2003; Cochran and Cauce, 2006). Our findings add to current knowledge by documenting substantial variability across the sexual orientation dimensions. For example, overall rates of substance abuse treatment utilization, including several specific types of substance abuse treatment, were more prevalent among respondents who identified as bisexual or who reported sexual behavior with both women and men. In contrast, although women who self-identified as lesbian or reported only same-sex attraction or behavior were significantly more likely than their heterosexual counterparts to report substance use disorders, they did not report higher rates of substance abuse treatment utilization, suggesting that these groups may be important targets for intervention efforts. The higher rates of substance abuse treatment utilization among bisexuals may be related to their ability to “pass” as heterosexuals when seeking medical treatment or their higher rates of therapy and diagnosis of substance use disorders (Bradford et al., 1994; Hughes et al., 2000; Sorenson & Roberts, 1997). In addition, although our findings provide some evidence that *sexual identity and sexual behavior* are more important dimensions than *sexual attraction* in predicting substance use disorders and substance abuse treatment utilization, differences in response options used in the sexual orientation measures may have influenced the results. Unlike the sexual identity and behavior measures used in the NESARC that included only three response options, the sexual attraction measure included five response options. Although the use of five response options allowed for more

nuanced reporting of sexual attraction, it may have resulted in fewer significant associations.

Overall, our results reinforce the importance of analyzing data separately by gender and sexual minority subgroup to better understand the health risks and health care utilization behaviors of sexual minorities.

Although we found substance abuse treatment utilization to be more prevalent among some sexual minority subgroups, it is likely that many sexual minority women and men who need treatment do not receive it, and even among those who get treatment, the quality of the treatment may be inadequate. Sexual minorities report high levels of discrimination experiences related to their health care (Krieger and Sidney, 1997; McCabe et al., 2010) and care by providers who lack knowledge about their unique health needs (Eliason & Hughes, 2004; Garnets et al., 1991; Hellman, 1996). In previous work using data from the NESARC gay men reported the highest rates of discrimination in relation to their health care (McCabe et al., 2010). Another potential barrier to substance abuse treatment is lack of health insurance coverage (Buchmueller & Carpenter, 2010; Heck et al., 2006; Owens et al., 2007). To determine whether this may have contributed to observed differences in treatment utilization, we examined the prevalence of health insurance coverage among those with lifetime substance use disorders across the three sexual orientation dimensions in the present study; no significant differences were found (results not shown, and available upon request).

A novel contribution of the present study is the finding that compared with their heterosexual counterparts, sexual minorities had a more extensive history of family substance abuse problems. This is an indication that resources to cope with family substance abuse problems are needed and

that early intervention may be particularly useful in reducing the risk of substance use disorders among sexual minorities. We also found gender differences in age of drinking onset, in that non-heterosexual women began to drink at significantly earlier ages than did heterosexual women; no such differences were found for men. These novel results may partially explain findings from this study and those of previous studies indicating that sexual minority women are more likely to report alcohol-related problems and to seek treatment for alcohol-related problems compared to their heterosexual counterparts (Cochran et al., 2000; Drabble et al., 2005; Wilsnack et al., 2008). This finding represents an important area for future research. In addition, it also has important practical implications in that substance abuse treatment- and other health care providers should be trained to work with sexual minority women who generally have more severe alcohol-related problems than heterosexual women.


4.2 Strengths and limitations

This study has several important strengths, including in-depth analyses of data collected from the largest national probability sample of sexual minority adults in the United States. Furthermore, the study examined all three major dimensions of sexual orientation (identity, attraction, and behavior) and assessed specific types of substance abuse treatment. Despite these strengths, there are several limitations to be considered when evaluating the study findings. First, the possibility of under-reporting same-sex sexual identity, attraction and behavior should be considered because sexual minorities continue to be stigmatized. The estimated prevalence rates of minority sexual orientation in the NESARC are slightly lower than previous national probability-based studies in the United States (Drabble et al., 2005; Russell et al., 2002), and

these differences deserve further consideration. The NESARC utilizes self-report face-to-face interviews, and several studies have shown that such data collection methods are subject to bias and may influence accurate reporting of sensitive behaviors (Cooley et al., 2000; Sudman and Bradburn, 1974; Turner et al., 1998). Second, small sample sizes of sexual minorities were an additional limitation because standard errors associated with many estimates were relatively large and some analyses were limited. For example, there were too few sexual minority respondents to permit simultaneous stratification by race/ethnicity or age. Future research is needed to examine age and race/ethnic differences in substance abuse treatment utilization among sexual minorities. Finally, while the reliability and validity of the measures for lifetime and past-year DSM-IV AUDADIS-IV diagnoses of substance use disorder have been established, Vergés and colleagues (2011) identified potential problems with the lifetime alcohol abuse diagnosis where meaningful cross-temporal comparisons are desired. As a result, we examined the alcohol use disorder outcomes split by abuse/dependence diagnoses and the results were consistent and did not change the main findings of the present study (results not shown, and available upon request).

In conclusion, this is the first study to provide estimates of substance abuse treatment utilization among sexual minorities in the United States across three major dimensions of sexual orientation. The underutilization of substance abuse treatment remains a problem among all adults in the United States, with only a small fraction of those with lifetime substance use disorders ever utilizing substance abuse treatment. Although non-heterosexual orientation is generally associated with higher odds of substance use disorders and substance abuse treatment utilization, there are important differences based on gender and across sexual orientation

dimensions. In addition, substance abuse treatment providers must be prepared to deal with earlier age of alcohol onset among sexual minority women and more extensive family histories of substance abuse problems among sexual minorities in general.



Acknowledgments

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) was funded by the National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, with supplemental support from the National Institute of Drug Abuse, National Institutes of Health.

The development of this manuscript was supported by research grant DA023055 from the National Institute on Drug Abuse, National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health. The authors would like to thank the anonymous reviewers for their helpful comments on a previous version of this article.

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Table 1. Estimated sexual orientation distributions among adults in the United States

	Women		Men	
Sexual orientation measures	% (SE) ^a	Sample Size ^b	% (SE) ^a	Sample Size ^b
Sexual identity				
Lesbian/Gay	0.7% (0.1)	145	1.1% (0.1)	190
Bisexual	0.8% (0.1)	161	0.4% (0.1)	81
Not sure	0.5% (0.1)	101	0.4% (0.1)	69
Heterosexual	98.0% (0.1)	19,489	98.1% (0.2)	14,109
Sexual attraction				
Only females	1.3% (0.1)	275	95.7% (0.2)	13,704
Mostly females	0.4% (0.1)	87	1.7% (0.1)	277
Equally males and females	1.3% (0.1)	260	0.7% (0.1)	130
Mostly males	4.2% (0.2)	880	0.5% (0.1)	96
Only males	92.8% (0.3)	18,358	1.4% (0.1)	229
Sexual behavior				
Only females	0.9% (0.1)	177	94.2% (0.3)	13,534
Both males and females	2.0% (0.1)	445	1.7% (0.1)	302
Never had sex	2.1% (0.2)	334	1.9% (0.2)	249
Only males	95.0% (0.2)	18,904	2.2% (0.2)	342

^aWeighted estimates; standard errors estimated using Taylor Series Linearization..^bUnweighted sample sizes.

Table 2. Weighted prevalence estimates of lifetime substance use disorders by sexual identity, sexual attraction and sexual behavior

Sexual orientation measures	Women			Men		
	Lifetime any substance ^a use disorder % (SE), n	Lifetime alcohol use disorder % (SE), n	Lifetime other drug use disorder % (SE), n	Lifetime any substance ^a use disorder % (SE), n	Lifetime alcohol use disorder % (SE), n	Lifetime other drug use disorder % (SE), n
Sexual identity						
Lesbian/Gay	60.8 (5.0), 145	58.6 (5.0), 145	24.5 (4.7), 145	65.0 (3.9), 190	58.7 (4.4), 190	32.7 (4.1), 190
Bisexual	61.9 (4.5), 161	53.5 (4.8), 161	40.4 (4.8), 161	55.8 (6.8), 81	52.1 (6.7), 81	25.4 (5.7), 81
Not sure	34.7 (6.6), 101	33.0 (6.7), 101	16.9 (4.5), 101	42.0 (7.7), 69	40.9 (8.0), 69	18.0 (5.9), 69
Heterosexual	24.3 (0.7), 19489	22.0 (0.7), 19489	8.0 (0.3), 19489	49.9 (0.9), 14109	47.7 (0.9), 14109	15.7 (0.5), 14109
<i>p</i> value	< 0.001	< 0.001	< 0.001	0.013	0.068	0.006
Sexual attraction						
Only males	35.1 (4.1), 275	33.6 (4.0), 275	10.5 (2.3), 275	43.2 (4.0), 229	40.1 (4.3), 229	19.5 (3.4), 229
Mostly males	50.3 (6.9), 87	49.1 (7.0), 87	27.1 (6.4), 87	56.4 (7.0), 96	48.8 (6.9), 96	21.0 (4.6), 96
Equally females and males	29.1 (3.4), 260	25.6 (3.4), 260	14.1 (2.3), 260	41.8 (4.7), 130	40.1 (4.8), 130	13.8 (3.3), 130
Mostly females	35.3 (2.3), 880	31.3 (2.2), 880	17.6 (1.8), 880	52.8 (3.8), 277	50.5 (3.8), 277	20.0 (2.9), 277
Only females	24.1 (0.7), 18358	21.9 (0.7), 18358	7.8 (0.3), 18358	50.2 (0.9), 13704	47.9 (0.9), 13704	15.8 (0.5), 13704
<i>p</i> value	< 0.001	< 0.001	< 0.001	0.111	0.122	0.338
Sexual behavior						
Only males	39.3 (4.8), 177	37.4 (4.8), 177	13.0 (2.9), 177	42.7 (3.2), 342	38.5 (3.1), 342	16.3 (2.6), 342
Both females and males	66.2 (2.7), 445	60.6 (2.8), 445	37.7 (2.8), 445	66.7 (3.5), 302	60.9 (3.6), 302	36.1 (3.3), 302
Never had sex	11.5 (2.4), 334	9.8 (2.1), 334	2.8 (1.2), 334	17.2 (3.1), 249	14.2 (2.7), 249	6.8 (2.4), 249
Only females	24.1 (0.7), 18904	21.9 (0.7), 18904	7.8 (0.3), 18904	50.7 (1.0), 13534	48.5 (1.0), 13534	15.8 (0.5), 13534
<i>p</i> value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

^aAny substance included alcohol, marijuana, cocaine, hallucinogens, inhalants, heroin, nonmedical use of sedative medication, tranquilizer medication, opioid medication, or stimulant medication.

Note: *p* value based on Rao-Scott chi-square test.

Table 3. Weighted estimates of adjusted odds ratios indicating differences in odds of substance use disorders across sexual identity, sexual attraction and sexual behavior subgroups

Sexual orientation measures	Women			Men		
	Lifetime any substance ^a use disorder AOR (95% CI) ^b	Lifetime alcohol use disorder AOR (95% CI) ^b	Lifetime other drug use disorder AOR (95% CI) ^b	Lifetime any substance ^a use disorder AOR (95% CI) ^b	Lifetime alcohol use disorder AOR (95% CI) ^b	Lifetime other drug use disorder AOR (95% CI) ^b
Sexual identity	n = 15,829	n = 15,829	n = 15,829	n = 13,067	n = 13,067	n = 13,067
Lesbian/Gay	3.1 (1.9, 5.2)***	3.2 (1.9, 5.3)***	2.7 (1.5, 4.7)***	1.6 (1.1, 2.3)*	1.3 (0.9, 1.9)	2.6 (1.7, 4.0)***
Bisexual	2.8 (1.8, 4.4)***	2.2 (1.4, 3.4)**	3.9 (2.5, 6.3)***	1.2 (0.7, 2.3)	1.1 (0.6, 2.0)	2.2 (1.1, 4.1)*
Not sure	2.3 (1.3, 4.1)**	2.4 (1.4, 4.4)**	2.7 (1.4, 5.4)**	0.8 (0.4, 1.6)	0.8 (0.4, 1.7)	1.3 (0.5, 3.0)
Heterosexual	Referent	Referent	Referent	Referent	Referent	Referent
Sexual attraction	n = 15,811	n = 15,811	n = 15,811	n = 13,056	n = 13,056	n = 13,056
Only same sex	1.9 (1.4, 2.8)***	2.0 (1.4, 2.8)***	1.5 (0.9, 2.5)	0.9 (0.6, 1.3)	0.8 (0.6, 1.2)	1.7 (1.1, 2.8)*
Mostly same sex	3.3 (1.6, 6.8)**	3.6 (1.8, 7.1)***	4.3 (2.2, 8.6)***	1.1 (0.6, 2.0)	0.9 (0.5, 1.5)	1.2 (0.6, 2.3)
Equally both sexes	1.6 (1.1, 2.4)*	1.4 (1.0, 2.2)	2.2 (1.4, 3.6)**	0.9 (0.5, 1.4)	0.9 (0.6, 1.4)	1.2 (0.7, 2.3)
Mostly other sex	1.6 (1.3, 2.0)***	1.5 (1.2, 1.8)***	2.3 (1.7, 3.0)***	1.2 (0.9, 1.7)	1.2 (0.9, 1.7)	1.7 (1.1, 2.5)*
Only other sex	Referent	Referent	Referent	Referent	Referent	Referent
Sexual behavior	n = 15,808	n = 15,808	n = 15,808	n = 13,053	n = 13,053	n = 13,053
Only same sex	2.1 (1.3, 3.3)**	2.1 (1.4, 3.3)**	1.8 (1.0, 3.1)*	0.8 (0.6, 1.0)	0.7 (0.5, 1.0)*	1.1 (0.7, 1.7)
Both sexes	3.4 (2.5, 4.5)***	3.0 (2.2, 3.9)***	3.7 (2.8, 5.0)***	1.6 (1.1, 2.3)*	1.3 (0.9, 1.7)	3.0 (2.2, 4.2)***
Never had sex	0.4 (0.2, 0.6)***	0.4 (0.2, 0.6)***	0.3 (0.1, 0.7)**	0.2 (0.1, 0.4)***	0.2 (0.1, 0.4)***	0.4 (0.2, 0.8)*
Only other sex	Referent	Referent	Referent	Referent	Referent	Referent

^aAny substance included alcohol, marijuana, cocaine, hallucinogens, inhalants, heroin, nonmedical use of sedative medication, tranquilizer medication, opioid medication, or stimulant medication.

^bAOR for each outcome indicates odds ratios adjusted for race, age, educational level, personal income, employment status, relationship status, health insurance status, geographic location, metropolitan statistical area, age at alcohol onset, and family history of alcohol and drug problems; the results for these variables are not shown. Sample sizes varied due to missing responses.

* p < 0.05, ** p < 0.01, *** p < 0.001.

Note: Models for lifetime other drug use disorder did not converge for women and estimates are based in the last iteration from the estimation procedure.

Table 4. Estimated prevalence of lifetime substance abuse treatment utilization among those with any lifetime substance use disorders^a by sexual identity, sexual attraction, and sexual behavior

	Overall	Women	Men	
	Lifetime substance abuse treatment utilization % (SE), n	Lifetime substance abuse treatment utilization % (SE), n	Lifetime substance abuse treatment utilization % (SE), n	Design-based Chi-square test of association between gender and treatment
Sexual identity				
Lesbian/Gay	24.4 (4.0), 194	20.6 (5.8), 81	26.8 (5.5), 113	0.57(1), p = 0.45
Bisexual	32.0 (4.9), 142	29.9 (5.8), 96	36.8 (8.5), 46	0.46(1), p = 0.50
Not sure	20.8 (5.9), 64	17.5 (7.7), 34	24.6 (8.5), 30	0.40(1), p = 0.53
Heterosexual	15.7 (0.5), 11616	13.1 (0.6), 4588	17.0 (0.6), 7028	19.68(1), p < 0.01
<i>R-S Chi-sq(df), p value</i>	4.81(3), p < 0.01	3.06(3), p = 0.03	2.51(3), p = 0.07	
Sexual attraction				
Only same sex	23.2 (3.7), 196	21.1 (5.4), 97	25.0 (5.6), 99	0.21(1), p = 0.65
Mostly same sex	22.0 (5.4), 94	9.5 (4.8), 42	31.5 (8.0), 52	5.14(1), p = 0.03
Equally females and males	18.3 (3.7), 135	18.6 (4.9), 76	18.0 (5.3), 59	0.01(1), p = 0.93
Mostly other sex	22.5 (2.4), 442	23.1 (3.0), 298	21.3 (3.7), 144	0.16(1), p = 0.69
Only other sex	15.6 (0.5), 11140	12.8 (0.6), 4278	17.0 (0.6), 6862	21.96(1), p < 0.01
<i>R-S Chi-sq(df), p value</i>	2.82(4), p = 0.03	3.54(4), p = 0.01	1.24(4), p = 0.30	
Sexual behavior				
Only same sex	16.9 (3.4), 217	17.2 (5.7), 71	16.8 (4.0), 146	<0.01(1), p = 0.96
Both females and males	30.1 (2.6), 481	26.3 (3.2), 281	34.9 (4.0), 200	2.73(1), p = 0.10
Only other sex	15.4 (0.5), 11235	12.8 (0.6), 4407	16.8 (0.6), 6828	20.60(1), p < 0.01
Never had sex	25.5 (6.7), 75	16.4 (7.9), 34	32.6 (10.2), 41	1.27(1), p = 0.26
<i>R-S Chi-sq(df), p value</i>	9.09(3), p < 0.01	5.23(3), p < 0.01	5.98(3), p < 0.01	

p value based on Rao-Scott chi-square tests (# d.f.) examining the bivariate associations between sexual identity, sexual attraction, and sexual behavior and each substance use outcome.

^aAny substance included alcohol, marijuana, cocaine, hallucinogens, inhalants, heroin, nonmedical use of sedative medication, tranquilizer medication, opioid medication, or stimulant medication.

Table 5. Estimated relationships of sexual identity, sexual attraction and sexual behavior with the odds of lifetime substance abuse treatment utilization, based on multiple logistic regression analyses for those with any lifetime substance abuse disorder^a

	Overall	Women	Men
	Lifetime substance abuse treatment utilization AOR ^b (95% CI)	Lifetime substance abuse treatment utilization AOR (95% CI) ^b	Lifetime substance abuse treatment utilization AOR (95% CI) ^b
Sexual identity			
Lesbian/Gay	1.8 (1.1 - 2.8)*	1.7 (0.8 - 3.8)	1.9 (1.1 - 3.3)*
Bisexual	2.0 (1.2 - 3.2)**	2.3 (1.3 - 4.3)**	2.6 (1.2 - 5.6)*
Not sure	1.2 (0.6 - 2.4)	1.2 (0.4 - 3.7)	1.5 (0.6 - 3.6)
Heterosexual	Referent	Referent	Referent
<i>n</i>	11848	4738	7110
Sexual attraction			
Only same sex	1.6 (1.1 - 2.5)*	1.8 (0.9 - 3.6)	1.8 (1.0 - 3.0)*
Mostly same sex	1.4 (0.7 - 2.8)	0.7 (0.2 - 2.7)	2.0 (0.9 - 4.4)
Equally females and males	1.1 (0.6 - 1.8)	1.4 (0.7 - 2.7)	0.9 (0.4 - 2.1)
Mostly other sex	1.3 (1.0 - 1.8)	2.0 (1.4 - 2.8)***	1.1 (0.7 - 1.8)
Only other sex	Referent	Referent	Referent
<i>n</i>	11841	4732	7109
Sexual behavior			
Only same sex	1.1 (0.7 - 2.0)	1.3 (0.5 - 3.2)	1.1 (0.6 - 2.0)
Both females and males	1.9 (1.5 - 2.5)***	2.2 (1.5 - 3.1)***	2.3 (1.5 - 3.4)***
Never had sex	2.0 (1.0 - 4.2)	1.7 (0.5 - 5.7)	2.3 (0.9 - 5.6)
Only other sex	Referent	Referent	Referent
<i>n</i>	11843	4734	7109

^aAny substance included alcohol, marijuana, cocaine, hallucinogens, inhalants, heroin, nonmedical use of sedative medication, tranquilizer medication, opioid medication, or stimulant medication.^bAOR for each outcome indicates odds ratios adjusted for race, age, educational level, personal income, employment status, relationship status, health insurance status, geographic location, metropolitan statistical area, age at alcohol onset and family history of alcohol and drug problems; the results for these variables are not shown. Sample sizes varied due to missing responses.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6. Prevalence estimates for types of substance abuse treatment across sexual identity subgroups, among those with lifetime substance use disorders

Leading types of substance abuse treatment (lifetime)	Overall sample (sexual identity)			
	Lesbian/Gay n=194 % (SE)	Bisexual n=142 % (SE)	Not sure n=64 % (SE)	Heterosexual n=11616 % (SE)
12-step meeting*	17.6 (3.4)	22.5 (4.1)	14.2 (5.2)	10.9 (0.4)
Physician, psychiatrist, psychologist or social worker*	13.6 (3.1)	21.1 (4.5)	10.0 (4.4)	7.5 (0.3)
Alcohol or drug rehabilitation	11.4 (2.7)	14.6 (3.6)	11.4 (4.7)	7.1 (0.3)
Emergency room*	9.1 (2.3)	9.9 (2.8)	8.8 (3.8)	3.8 (0.2)
Outpatient clinic	8.1 (2.1)	10.5 (3.0)	8.8 (4.4)	4.7 (0.2)
Alcohol or drug detoxification ward or clinic*	7.6 (2.3)	16.0 (3.7)	9.9 (4.7)	5.1 (0.3)
Inpatient psychiatric unit	5.8 (1.8)	9.5 (2.9)	3.6 (2.4)	3.7 (0.2)
Crisis center	2.7 (1.3)	2.8 (2.0)	3.3 (2.3)	0.7 (0.1)
Employee assistance program***	2.0 (1.0)	6.6 (2.4)	0.0 (0.0)	1.2 (0.1)
Halfway house/therapeutic community***	0.0 (0.0)	5.5 (2.4)	2.3 (2.0)	1.2 (0.1)
Family or other social service agency	6.2 (2.1)	13.0 (3.6)	4.7 (2.6)	3.8 (0.2)
Clergyman, priest, rabbi, or other religious counselor	4.1 (1.7)	6.2 (2.4)	4.6 (3.1)	2.5 (0.2)

Note: Percentages are weighted estimates, and standard errors are computed based on Taylor Series Linearization.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, based on Rao-Scott chi-square test with 3 d.f.

Table 7. Prevalence estimates for types of substance abuse treatment across sexual attraction subgroups, among those with lifetime substance use disorders

Leading types of substance abuse Treatment (lifetime)	Overall sample (sexual attraction)				
	Only same sex n=196 % (SE)	Mostly same sex n=94 % (SE); n	Both sexes equal n=135 % (SE); n	Mostly other sex n=442 % (SE)	Only other sex n=11140 % (SE)
12-step meeting	17.1 (3.0)	18.5 (5.0)	13.6 (3.1)	12.7 (1.9)	10.9 (0.4)
Physician, psychiatrist, psychologist or social worker*	11.1 (2.7)	13.4 (4.6)	9.0 (2.7)	15.6 (2.2)	7.3 (0.3)
Alcohol or drug rehabilitation	9.1 (2.4)	13.3 (4.4)	9.6 (2.6)	7.8 (1.7)	7.1 (0.3)
Emergency room	8.9 (2.3)	8.0 (3.5)	4.0 (1.6)	5.8 (1.3)	3.8 (0.2)
Outpatient clinic	5.2 (1.5)	13.5 (4.5)	6.4 (2.2)	7.4 (1.6)	4.7 (0.2)
Alcohol or drug detoxification ward or clinic	7.3 (2.2)	10.7 (4.0)	9.5 (2.7)	7.2 (1.3)	5.1 (0.3)
Inpatient psychiatric unit	3.3 (1.1)	8.9 (3.6)	8.2 (2.6)	5.0 (1.1)	3.7 (0.2)
Crisis center	1.2 (0.7)	3.5 (2.7)	0.7 (0.7)	1.6 (0.7)	0.7 (0.1)
Employee assistance program	0.8 (0.6)	2.7 (1.9)	4.9 (2.1)	2.1 (0.8)	1.2 (0.1)
Halfway house/therapeutic community	0.4 (0.4)	0.0 (0.0)	0.4 (0.4)	2.9 (1.0)	1.2 (0.1)
Family or other social service agency	5.8 (1.9)	6.5 (2.9)	6.3 (2.1)	7.5 (1.7)	3.8 (0.2)
Clergyman, priest, rabbi, or other religious counselor	4.8 (2.0)	2.8 (2.1)	4.0 (1.8)	3.5 (1.1)	2.5 (0.2)

Note: Percentages are weighted estimates, and standard errors are computed based on Taylor Series Linearization.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, based on Rao-Scott chi-square test with 4 d.f.

Table 8. Prevalence estimates for types of substance abuse treatment across sexual behavior subgroups, among those with lifetime substance use disorders

Leading types of substance abuse treatment (lifetime)	Overall sample (sexual behavior)			
	Only same sex n=217 % (SE)	Both sexes n=481 % (SE)	Never had sex n=75 % (SE)	Only other sex n=11235 % (SE)
12-step meeting**	12.9 (2.7)	21.1 (2.3)	11.9 (4.5)	10.8 (0.4)
Physician, psychiatrist, psychologist or social worker***	8.2 (2.6)	20.0 (2.5)	18.6 (6.4)	7.2 (0.3)
Alcohol or drug rehabilitation*	6.8 (1.9)	15.0 (2.2)	8.3 (4.2)	6.9 (0.3)
Emergency room**	5.2 (1.7)	10.1 (1.6)	2.9 (2.3)	3.8 (0.2)
Outpatient clinic*	4.2 (1.5)	11.3 (2.0)	4.8 (3.0)	4.6 (0.2)
Alcohol or drug detoxification ward or clinic**	5.0 (1.3)	12.4 (1.9)	5.5 (3.4)	5.0 (0.3)
Inpatient psychiatric unit**	3.9 (1.2)	11.4 (1.8)	3.0 (2.4)	3.5 (0.2)
Crisis center***	1.4 (0.9)	3.3 (1.1)	0.0 (0.0)	0.7 (0.1)
Employee assistance program***	0.3 (0.3)	4.9 (1.1)	0.0 (0.0)	1.2 (0.1)
Halfway house/therapeutic community***	0.7 (0.7)	3.1 (1.0)	0.0 (0.0)	1.2 (0.1)
Family or other social service agency**	5.2 (1.7)	12.1 (2.1)	6.8 (3.8)	3.6 (0.2)
Clergyman, priest, rabbi, or other religious counselor*	2.9 (1.4)	7.2 (1.5)	1.9 (1.9)	2.4 (0.1)

Note: Percentages are weighted estimates, and standard errors are computed based on Taylor Series Linearization.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, based on Rao-Scott chi-square test with 3 d.f.