

# Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population

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## ABSTRACT

**Aims** The aim of this study was to compare patterns of drug use and dependence between homosexually experienced and exclusively heterosexually experienced individuals.

**Design** We used a cross-sectional national household interview survey conducted in the United States.

**Setting** Secondary data analysis of the 1996 National Household Survey on Drug Abuse was employed.

**Participants** Participants were sexually active individuals, aged 18 years and older, who reported the genders of their sexual partners in the past 12 months; included 174 homosexually experienced (98 men, 96 women) and 9714 exclusively heterosexually experienced (3922 men, 5792 women) respondents.

**Measurements** Life-time, past 30 days and daily use of nine classes of drugs. Symptoms of dysfunctional use and dependence.

**Findings** There were consistent patterns of elevated drug use in homosexually experienced individuals for life-time drug use, but these were greatly attenuated for recent use. Homosexually experienced men were more likely to report use of marijuana, cocaine and heroin, and homosexually experienced women more likely to report use of marijuana and analgesics than individuals reporting only opposite-sex partners. Both homosexually active men and women were more likely than exclusively heterosexually active respondents to report at least one symptom indicating dysfunctional drug use across all drug classes, and to meet criteria for marijuana dependence syndrome. The only difference between homosexually experienced men and women was that men were more likely to report any daily drug use.

**Conclusions** These data are consistent with surveys suggesting that there is a moderate elevation of drug, particularly marijuana, use and dependence in gay and bisexual men and women when compared to heterosexual men and women.

**KEYWORDS** Drug use, drug dependence, epidemiology, homosexuality.

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## INTRODUCTION

Drug use and drug dependence may represent an important health risk for some lesbians and gay men (McKirnan & Peterson 1989; Skinner 1994; Greenwood *et al.*

2001; Ross & Williams 2001; Hughes & Eliason 2002; Stueve *et al.* 2002). Reviews estimate that lesbians, gay men and bisexual women and men may be two to three times more likely than heterosexual individuals to abuse drugs (Bux 1996; Jordan 2000). Research examining the

potential psychiatric consequences of stress generated by the human immunodeficiency virus (HIV) epidemic (for gay and bisexual men) or social stigma associated with homosexuality also finds some evidence that sexual orientation minorities may be at greater than expected risk for drug and/or alcohol abuse (Stall & Wiley 1988; McKirnan & Peterson 1989; Bux 1996; Cochran *et al.* 1996; Atkinson *et al.* 1988; Stall *et al.* 2001).

However, previous research is not entirely clear on the types of drugs that gay men and, especially, lesbians in general may be using. Some studies have found higher than expected rates of marijuana use among gay men and lesbians (Saulnier & Miller 1997; Stall *et al.* 2001; Woody *et al.* 2001). Others have reported higher rates of cocaine use as well (McKirnan & Peterson 1989; Bux 1996). Many of these estimates of illicit drug use are derived from convenience samples and recruited volunteers. As a result, findings may be distorted by the selection bias inherent in the highly motivated volunteer samples (Rothman & Greenland 1998).

Population-based drug use surveys that identify individuals who may differ in sexual orientation are extremely rare (Cochran 2001) and those that exist have focused solely on men (Stall & Wiley 1988; Greenwood *et al.* 2001; Stall *et al.* 2001). One early population-based survey of men recruited from high gay-density neighborhoods reported few differences in drug use patterns between gay, bisexual and heterosexual men residing there (Stall & Wiley 1988). Later studies (Greenwood *et al.* 2001; Stall *et al.* 2001) of gay men are more suggestive of high rates of marijuana, cocaine and stimulant use in this population, but their study designs lacked heterosexual comparison groups.

The present work sought to clarify the types and patterns of illicit drug use among homosexually experienced men and women. To do so, we used information available in the 1996 National Household Survey on Drug Abuse (NHSDA). The 1996 NHSDA included supplemental questions regarding the gender of respondents' sexual partners during the previous 12 months. Our primary objective was to examine differences between homosexually experienced individuals and exclusively heterosexually active men and women in illicit drug use, abuse and dependence. A second objective was to explore possible gender differences among homosexually experienced individuals. Given that effective health interventions targeted toward the gay community often differ in their approaches to lesbians or gay men (East & Rayess 1998), identifying gender-based differences within this subpopulation may enhance tailoring of services. However, it is also possible that normative gender differences in drug use might be attenuated in the gay community. In an earlier analysis of the 1996 NHSDA (Cochran & Mays 2000), we observed that women with histories of recent

same-gender partners were much more likely, compared to exclusively heterosexually experienced women, to meet criteria for drug dependence. At the same time, there was little difference in prevalence of drug dependence between homosexually experienced women and men. This lack of a gender difference stands in marked contrast to findings from epidemiological studies of substance use in the general population that consistently estimate that substance use and dependence are higher among males (Regier *et al.* 1993; Kessler *et al.* 1994).

## METHODS

### Source of the data

We used information available in the 1996 National Household Survey on Drug Abuse (NHSDA). This population-based survey is conducted annually by the Substance Abuse and Mental Health Services Administration (SAMHSA) to estimate the prevalence of substance use in the US population for surveillance purposes. In 1996, using complex stratified, multi-stage cluster sampling of the civilian non-institutionalized population, the NHSDA interviewed 18 269 respondents aged 12 years and older, with over-sampling of both younger individuals and those from black and Hispanic backgrounds to enhance precision of estimates. Weights allow for estimation of population parameters, adjusting for selection probability, non-response and poststratification. The data set is available for public use and is described in more detail elsewhere (Office of Applied Studies 1996).

In the 1996 survey only, all respondents age 18 years and older were also asked supplemental questions about the genders of their sexual partners in the previous 12 months. This information enabled us to classify the sample into four groups: those indicating no sexual partners in the past year ( $n = 2479$ ), those acknowledging only opposite-gender sexual partners ( $n = 9714$ ), those reporting only same-gender sexual partners ( $n = 135$ ) and those reporting sexual partners of both genders ( $n = 59$ ). Because individuals with no sexual partners in the previous year could not be classified reliably for sexual orientation, they were dropped from further consideration. The final sample consisted of 9908 respondents who reported at least one sexual partner in the year prior to interview, including 194 individuals who indicated at least one same-gender sexual partner.

### Instrumentation

Respondents were administered a fully structured interview by extensively trained interviewers. Questions assessing both sexual behavior and drug use were asked via a self-administered questionnaire completed within

the context of the interview process in order to enhance validity of responses.

#### *Recent sexual history*

All respondents who reported vaginal, oral or anal sex with at least one person in the past 12 months were asked whether, in the last 12 months, their sexual partners had been only males, only females, or both males and females. From this, we were able to code for evidence of same-gender sexual behavior.

#### *Drug use*

Individuals were also interviewed about their life-time and recent use of nine different classes of drugs. Five of these were illicit drugs virtually always used for non-medical reasons: marijuana or hashish, cocaine or crack, heroin, hallucinogens and inhalants. Four classes included drugs that are available by prescription (analgesics, tranquilizers, stimulants and sedatives), but use was specified as occurring either when not prescribed or when taken specifically for the purpose of experiencing the effects of the drug. For each of the nine drug classes, we coded whether or not the respondent reported ever having used any drug in the specified class ever, in the 30 days prior to interview, or on a daily basis.

#### *Dysfunctional use and drug dependence*

Respondents also answered questions assessing the presence or absence of six of seven symptoms of drug dependence within in the prior year. Items reflected DSM-IV (American Psychiatric Association 1994) defining symptoms of drug dependence including: (1) building up a tolerance for the drug; (2) taking the drug more often or in larger amounts than intended; (3) wanting to cut down on use but being unable to do so; (4) spending a great deal of time in drug-related activities; (5) experiencing impairment in meeting social obligations or engaging in recreational activities due to drug use; and (6) experiencing emotional and/or physical problems caused by drug use. A seventh DSM-IV criterion, withdrawal symptoms, was not assessed during the interview. According to DSM-IV criteria, drug dependence requires the presence of three or more of these seven specific symptoms. We coded individuals as positive for 1-year prevalence of dysfunctional drug use in a specific class if they reported both use and any of the six symptoms measured within that drug class. Those reporting use and three or more symptoms for each drug class were coded as a probable case of drug dependence consistent with Substance Abuse and Mental Health Services Administration (SAMHSA) scoring

recommendations (Cochran & Mays 2000). We refer to this as drug dependence syndrome, reflecting our inability to make a definitive diagnosis.

#### *Personal demographics*

During the course of the interview, respondents were also questioned about their personal demographics including age, level of education, annual personal income and ethnic/racial identification.

#### **Data analysis**

Data were analyzed using STATA (StataCorp 1999), a set of statistical software programs designed specifically for use with complex weighted sample designs such as the NHSDA. We report recent, 1-year, and life-time prevalence of drug use, 1-year prevalence of dysfunctional use and 1-year prevalence of drug dependence in each of the nine drug classes by gender of sexual partners. These are presented separately for men and women due to the well-known and robust gender differences in drug use patterns (Johnson & Gerstein 1998; Brady & Randall 1999). Analyses were conducted using logistic regression models. Age, race/ethnicity and educational attainment were considered possible confounders due to previous research suggesting their association with both drug use (Johnson & Gerstein 1998) and sexual orientation in population-based surveys similar to the NHSDA (Cochran & Mays 2000; Cochran 2001; Gilman *et al.* 2001). We report results from analyses adjusting for the demographic confounders, using 95% confidence intervals (CI) to indicate sampling variability. All reported odds ratios (OR) are adjusted. Confidence intervals that do overlap 1 are significant at the  $P < 0.05$  level.

## **RESULTS**

### **Demographic correlates of sexual behavior**

Overall, 1.6% (CI: 1.2–2.1%) of sexually active people reported one or more same-gender sex partners in the prior year. Of these, approximately 57% (CI: 52–62%) were men. Among men, those reporting any same-gender sex partners had attained higher levels of education than those indicating only opposite-gender sex partners, after adjusting for the remaining demographic factors (Table 1). For women, those claiming any same-gender sex partners were significantly younger than those who did not, after similar adjustment for other demographic factors. Otherwise, homosexually active men and women were similar to exclusively heterosexually active men and women, respectively.

**Table 1** Demographic characteristics among sexually active individuals, age 18 or older, estimated from the 1996 NHSDA by self-reports of prior year sexual partner genders. Percentages are estimated using sampling weights.

Characteristic	Men				P-value*	Women				P-value*
	Any same-gender partner reported (unweighted n = 98)		Opposite-gender partners only (unweighted n = 3922)			Any same-gender partner reported (unweighted n = 96)		Opposite-gender partners only (Unweighted n = 5792)		
Mean age (years)	34	(1.4)†	37	(0.4)	0.12	33	(1.2)	37	(0.4)	0.002
Level of education (%)					0.5					0.24
Less than 12 years	8	(3)	16	(1)		25	(10)	15	(1)	
High school degree	22	(7)	33	(1)		29	(7)	34	(1)	
Some college	28	(8)	24	(1)		17	(4)	25	(1)	
College degree	42	(8)	28	(2)		29	(7)	25	(1)	
Personal annual income more than \$20,000 (%)	66	(7)	66	(1)	0.79	36	(7)	33	(1)	0.14
Ethnic/racial background (%)					0.70					0.95
White, not Hispanic	73	(6)	74	(1)		70	(6)	76	(1)	
Black, not Hispanic	11	(3)	11	(1)		12	(3)	11	(1)	
Hispanic	7	(2)	11	(1)		14	(4)	9	(1)	
Other	9	(6)	4	(1)		4	(4)	4	(1)	

\*Estimated from logistic modeling evaluating probability of same-gender sex partners from all demographic characteristics (age, ethnicity/race, education, and income) simultaneously.

†Numbers in parentheses are standard errors.

### Patterns of drug use

We observed consistent patterns of elevated life-time drug use in homosexually active individuals compared to exclusively heterosexually active people. Among men specifically, those reporting any same-gender sexual partners in the year prior to interview were significantly more likely than those who did not to report having used at least one class of drugs for non-medical reasons at some time in their lives (Table 2). This included cocaine (OR = 2.5, CI = 1.4, 4.4), hallucinogens (OR = 2.3, CI = 1.2, 4.6), inhalants (OR = 3.8, CI = 2.2, 6.8), analgesics (OR = 2.2, CI = 1.0, 5.0) and tranquilizers (OR = 2.9, CI = 1.4, 6.1). Adjusted estimates for life-time use of sedatives (OR = 2.5, CI = 0.9, 7.4), stimulants (OR = 2.2, CI = 0.9, 5.4), and heroin (OR = 2.4, CI = 0.8, 7.3) were also elevated, but not significantly so. Similarly, among women, those who reported any same-gender sexual partners were more likely than other sexually active women to have used any illicit drug during their life-time (OR = 5.8, CI = 2.6, 13) including marijuana (OR = 5.7, CI = 2.7, 12), hallucinogens (OR = 2.9, CI = 1.4, 5.9), cocaine (OR = 5.0, CI = 2.2, 11), inhalants (OR = 3.3, CI = 1.3, 8.0), sedatives (OR = 4.9, CI = 1.4, 17), and stimulants (OR = 2.6, CI = 1.1, 6.2). The adjusted estimate for life-time use of tranquilizers was also comparatively elevated (OR = 2.1, CI = 0.9, 5.2).

These differences were greatly attenuated in reports of recent drug use. Nevertheless, homosexually active men

were more likely than exclusively heterosexually active men to report having used cocaine (OR = 3.4, CI = 1.0, 11) and heroin (OR = 9.5, CI = 1.5, 60) in the month prior to interview. These men also were more likely to report daily use of marijuana (12%; OR = 3.5, CI = 1.3, 9.3) and/or cocaine (2.2%; OR = 10, CI = 2.3, 47) when compared to men who reported only opposite-gender sexual partners (3.9% and 0.3% daily use, respectively).

Women reporting any female sexual partners were also more likely than women reporting only male sexual partners to have used drugs for non-medical reasons in the month preceding the interview (OR = 3.7, CI = 1.6, 8.8). In particular, they were more likely to have used marijuana (OR = 4.4, CI = 1.8, 11) and analgesics (OR = 6.4, CI = 1.6, 26). Recent cocaine use also appeared higher (OR = 2.5, CI = 0.8, 8.3), but not significantly so. For daily use, prevalence estimates for marijuana and cocaine were higher among homosexually active women (3.3% and 0.8%, respectively) compared with exclusively heterosexually active women (1.3% and 0.2%, respectively), although the adjusted odds ratios for both marijuana (OR = 2.4, CI = 0.8, 7.1) and cocaine (OR = 3.2, CI = 0.6, 16) were quite wide and we could not rule out sampling variability as a reason for the observed differences.

Over all drug classes, men were significantly more likely than women to report any daily drug use for non-medical reasons (OR = 3.3, CI = 2.4, 4.4) or any use in the past month (OR = 2.7, CI = 2.3, 3.3) or ever

**Table 2** Self-reported drug use ever and in month prior to NHSDA interview by gender and genders of sexual partners in past year:

Drug class	Life-time use																
	Men						Women										
	Any male partners			Female partners only			Any female partners			Male partners only							
%	(SE)	%	(SE)	%	(SE)	Men			Women								
Use in prior month						Any male partners			Female partners only			Any female partners			Male partners only		
%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
Marijuana	64.6	(8.8)	52.3	(1.3)	75.8*	(5.8)	39.6	(11.6)	13.9	(4.8)	8.4	(0.5)	14.0*	(4.7)	3.4	(0.3)	
Cocaine	37.2*	(6.8)	19.5	(0.9)	38.5*	(8.8)	12.1	(0.7)	3.9*	(2.0)	1.2	(0.2)	1.7	(1.0)	0.6	(0.1)	
Hallucinogens	34.7*	(7.5)	18.0	(1.1)	22.9*	(6.0)	9.9	(0.7)	1.6	(1.2)	0.7	(0.1)	1.4	(1.0)	0.3	(0.1)	
Heroin	4.1	(2.0)	2.2	(0.4)	2.8	(1.6)	0.9	(0.2)	0.8	(0.8)	0.1	(0.1)	0.0	(0.0)	0.0	(0.0)	
Inhalants	30.8*	(6.0)	9.8	(0.8)	14.3*	(5.4)	5.0	(0.5)	0.0	(0.0)	0.6	(0.2)	0.0	(0.0)	0.1	(0.0)	
Sedatives	9.0	(4.1)	4.0	(0.5)	7.9*	(4.5)	1.9	(0.3)	0.0	(0.0)	0.1	(0.0)	1.0	(1.0)	0.2	(0.1)	
Stimulants	14.4	(5.1)	7.3	(0.7)	12.5*	(4.5)	5.3	(0.5)	0.7	(0.7)	0.9	(0.2)	1.1	(1.1)	0.5	(0.1)	
Analgesics	15.9*	(5.5)	7.9	(0.6)	6.6	(2.3)	5.7	(0.5)	0.0	(0.0)	1.0	(0.2)	3.3*	(1.7)	0.5	(0.1)	
Tranquilizers	13.9*	(4.3)	5.4	(0.5)	7.4	(3.1)	3.7	(0.4)	0.4	(0.4)	0.6	(0.2)	1.0	(1.0)	0.4	(0.1)	
Any drug class	72.8*	(8.2)	54.6	(1.2)	77.9*	(5.6)	42.3	(1.1)	16.3	(5.0)	9.9	(0.6)	15.1*	(4.8)	4.5	(0.4)	

Percentages are estimated using sampling weights. Unweighted sample sizes are for homosexually active men (n = 98) and women (n = 96) and heterosexually active men (n = 3922) and women (n = 5792). \*P < 0.05, when sexual orientation effect evaluated by logistic regression analyses conducted on each gender separately while adjusting for possible demographic confounding.

(OR = 1.6, CI = 1.4, 1.8), after adjusting for demographic confounding due to age, education, income and ethnic/racial background. However, among men and women who reported any same-gender sexual partners, the only difference appeared to be in daily drug use; men were more likely than women to report any daily drug use (OR = 14, CI = 2.0, 9.4). We observed little evidence for differences in life-time drug use (OR = 0.8, CI = 0.28, 2.5) or past month use (OR = 2.0, CI = 0.5, 7.8).

#### Evidence for dysfunctional use

Without considering sexual orientation, men were more likely than women to report at least one symptom of dysfunctional drug use (OR = 2.4, CI = 1.9, 2.9) or to meet criteria for drug dependence syndrome (OR = 2.4, CI = 1.7, 3.4) across all drug classes within the year prior to interview, after adjusting for possible confounding due to age, educational attainment, income or ethnic/racial group membership (Table 3). These gender differences were not apparent when we contrasted homosexually active men and women separately either in the presence of any symptoms of dysfunctional drug use (OR = 2.2, CI = 0.6, 8.6) and in meeting criteria for drug dependence syndrome (OR = 1.5, CI = 0.4, 5.9).

Among men, those who were homosexually active were significantly more likely than those who were exclusively heterosexually active to report at least one symptom indicating dysfunctional drug use (OR = 2.4, CI = 1.0, 5.6) across all drug classes. This effect appeared to be due primarily to greater risk for problems associated with marijuana use (OR = 2.6, CI = 1.1, 6.4). Although drug dependence syndrome across all drug classes was estimated to be higher among men who reported any same-gender sex partners compared to men who indicated only female sexual partners, the estimate did not achieve statistical significance (OR = 2.1, CI = 0.9, 4.9). Nevertheless, men who reported any same-gender sexual partners were more likely than exclusively heterosexually active men to meet criteria for marijuana dependence syndrome (OR = 2.8, CI = 1.1, 7.1).

Among women, those who reported any female sexual partners were more likely than those reporting only male sexual partners to evidence at least one symptom of dysfunctional drug use across all drug classes (OR = 3.9, CI = 1.6, 9.8). Specifically, these women indicated greater problems with marijuana use (OR = 4.9, CI = 1.8, 13), cocaine use (OR = 3.7, CI = 1.1, 12) and hallucinogen use (OR = 4.1, CI = 1.1, 15). Adjusted estimates for dysfunctional heroin (OR = 4.4, CI = 0.8, 24) and sedative use (OR = 4.2, CI = 0.8, 22) were also elevated, but not significantly so. Homosexually active women were also more likely than other sexually active women to meet criteria for any drug dependence

syndrome (OR = 3.3, CI = 1.2, 8.7). Specifically, these women were more likely than heterosexually active women to evidence marijuana dependence syndrome (OR = 4.0, CI = 1.4, 11) and were somewhat more likely to be dependent on cocaine (OR = 4.4, CI = 0.9, 22).

## DISCUSSION

Our findings are consistent with those from previous studies of drug use among gay men and lesbians (Cochran & Mays 2000; Catania *et al.* 2001; Gilman *et al.* 2001; Woody *et al.* 2001; Scheer *et al.* 2002; Stueve *et al.* 2002). Across studies, lesbians and gay men evidence higher prevalences of use and problems with illicit drug use. However, we did observe some new findings that were somewhat surprising and unexpected.

In our study, marijuana was the most commonly used drug and was also the drug upon which homosexually active men and women were most likely to be dependent. This echoes findings by Woody *et al.* (2001), who observed high rates of marijuana use among gay and bisexual men when compared to age-standardized rates for the US population. In the current study, homosexually experienced men were more likely than exclusively heterosexually active men to use cocaine and marijuana daily. Despite their regular use of cocaine, they were not more likely to meet criteria for dependence or report any problems with cocaine. Homosexually experienced women appear to have a similarly increased risk for marijuana and cocaine use. Here we observed that these women were more likely than exclusively heterosexual active women to report problems associated with the use of marijuana and cocaine. There were also other differences in patterns of drug use. For example, recent hallucinogen use was higher among young homosexually experienced women (between 18 and 26 years of age) compared to similar exclusively heterosexually active women.

Previous non-population-based studies of homosexual samples have identified higher rates of marijuana and cocaine use among lesbians and gay men than estimates from the general population, although not necessarily heavy use (McKirnan & Peterson 1989; Cochran *et al.* 1996; Woody *et al.* 2001). In McKirnan & Peterson (1989) the robust and well-documented pattern of greater male than female drug use and decline in use with age were not found for their homosexual sample. With the exception of the age difference, our findings are similar. Our findings are also consistent with recent population-based surveys of gay and bisexual men (Greenwood *et al.* 2001; Stall *et al.* 2001).

There are several considerations that may account for the patterns of drug use evidenced in both in the

**Table 3** One-year prevalence of indicators of dysfunctional drug use and drug dependence syndrome by gender and gender of sexual partners in previous year.

Drug class	Dysfunctional use <sup>1</sup>						Drug dependence syndrome <sup>2</sup>									
	Men			Women			Men			Women						
	Any male partners % (SE)	Female partners only % (SE)	Male partners only % (SE)	Any female partners % (SE)	Female partners only % (SE)	Male partners only % (SE)	Any male partners % (SE)	Female partners only % (SE)	Male partners only % (SE)	Any female partners % (SE)	Female partners only % (SE)	Male partners only % (SE)				
Marijuana	15.0*	(5.5)	6.6	(0.5)	12.0*	(4.5)	2.8	(0.3)	5.7*	(2.5)	2.1	(0.2)	3.9*	(1.8)	0.9	(0.1)
Cocaine	4.3	(2.2)	2.1	(0.3)	3.2*	(1.7)	0.9	(0.2)	1.4	(1.4)	0.7	(0.2)	1.1	(0.8)	0.2	(0.1)
Hallucinogens	2.8	(1.6)	1.6	(0.3)	3.4*	(1.9)	0.8	(0.2)	0.0	(0.0)	0.2	(0.1)	0.4	(0.4)	0.2	(0.1)
Heroin	2.0	(1.4)	0.9	(0.2)	1.5	(1.2)	0.4	(0.1)	0.0	(0.0)	0.2	(0.1)	0.0	(0.0)	0.0	(0.0)
Inhalants	0.6	(0.4)	1.0	(0.3)	0.0	(0.0)	0.4	(0.1)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Sedatives	0.2	(0.2)	0.8	(0.2)	1.7	(1.3)	0.4	(0.1)	0.0	(0.0)	0.1	(0.1)	0.0	(0.0)	0.1	(0.0)
Stimulants	1.8	(1.2)	1.2	(0.3)	1.1	(1.1)	0.7	(0.1)	0.0	(0.0)	0.3	(0.1)	0.0	(0.0)	0.2	(0.1)
Analgesics	0.2	(0.2)	1.4	(0.3)	0.0	(0.0)	1.0	(0.2)	0.0	(0.0)	0.2	(0.1)	0.0	(0.0)	0.2	(0.1)
Tranquilizers	0.2	(0.2)	1.0	(0.2)	0.0	(0.0)	0.7	(0.2)	0.0	(0.0)	0.2	(0.1)	0.0	(0.0)	0.2	(0.1)
Any drug class	16.0*	(5.6)	7.7	(0.5)	14.0*	(4.5)	3.8	(0.4)	5.7	(2.5)	2.8	(2.8)	5.0*	(2.0)	1.3	(0.2)

Percentages are estimated using sampling weights. Unweighted sample sizes are for homosexually active men (n = 96) and heterosexually active men (n = 3922) and women (n = 5792). <sup>1</sup>Respondent answered yes to any of the six symptoms of drug dependence in the past year. <sup>2</sup>Respondent answered yes to three or more of six symptoms of drug dependence in the past year. \*P < 0.05, when sexual orientation effect evaluated by logistic regression analyses conducted on each gender separately and adjusted for possible demographic confounding.

literature and here. First, differential patterns of drug use among individuals varying in sexual orientation may originate in adolescence or even early adulthood. Previous research has shown that higher levels of substance abuse are evident in sexual minority youth as compared to their heterosexual peers (Blake *et al.* 2001). In one population-based study, Russell, Driscoll & Truong (2002) found that male youth with both-sex attractions and adolescent women with same-sex attractions were more likely to report substance use than heterosexual adolescents, although their trajectories of substance use/abuse did not differ from that of heterosexual youths. An important factor that may account for this difference is the significant stressors experienced by homosexually active youth and young adults in their home, school and other social environments (Savin-Williams 1994). Such stressors may include verbal and physical abuse as well as more general societal homophobia (Cabaj 1996). Some research suggests (McKirnan & Peterson 1989) that these types of stress are related to higher levels of alcohol and drug use.

A second consideration is the cultural importance of bars as a meeting place in the gay and lesbian community (Ross, Fernández-Esquer & Seibt 1995). Socializing in gay bars is likely to enhance both the opportunity and modeling of alcohol overuse. Tension-reduction expectancies of alcohol have a substantial impact on alcohol and drug abuse, and coupled with the use of bars as a social resource for gay men and lesbians may account for the higher rates of substance use (McKirnan & Peterson 1989).

More recently, circuit parties have become a visible venue in the gay subculture, particularly for young gay white men. These are large events with perhaps 15 000–25 000 people in attendance that are held at various sites across the country, often on annual basis. Circuit parties are characterized by spectacular light shows, music, dancing, a celebration of the gay life-style and sometimes drug (including polydrug) use (Lewis & Ross 1995; Colfax *et al.* 2001; Halkitis, Parsons & Stirratt 2001; Mansergh *et al.* 2001; Mattison *et al.* 2001; Ross, Mattison & Franklin 2003). We find evidence here, among both homosexually active men and women, of greater use of hallucinogens, inhalants and stimulants compared to exclusively heterosexually active individuals. Further, dysfunctional hallucinogen use was significantly elevated in homosexually active women. While studies of hallucinogenic drug use among sexual minorities (Stall & Wiley 1988; Greenwood *et al.* 2001; Colfax *et al.* 2001; Mattison *et al.* 2001; Klitzman *et al.* 2002; Romanelli *et al.* 2003) have focused generally on gay men out of concern for HIV prevention, our results indicate broadening that concern to include young lesbians' use of hallucinogens.

One limitation of this study is that amphetamine (including methamphetamine) use was not assessed in the study. It would have been the better marker of any impact of the circuit party and club scene on gay men. Another concern is our use of a non-diagnostic measure for determining the caseness for drug dependence. While the NHSDA interview did measure six of seven core drug dependence symptoms, it did not assess whether the respondent had experienced withdrawal symptoms, a strong marker of physiological dependence. This may have reduced the accuracy of our diagnostic classifications. A third limitation is the small sample size of the homosexually experienced individuals, a common problem of general population-based samples that do not oversample for minority sexual orientation (Cochran 2001). This led to imprecision of our estimates and reduced power for detecting statistically significant effects. A fourth limitation is that our measurement of sexual orientation was limited to sexually active people who reported a same-gender sexual partner in the prior 12 months. Many of these people would not self-identify as lesbian, gay or bisexual had they been asked (Cochran 2001). The effects of this misclassification bias are not well known. Further, our estimates of drug use are probably somewhat higher than that seen in the total population of lesbian, gay, bisexual and heterosexual adults due to the unavoidable confounding with recent sexual activity (Cochran *et al.* 2000). However, these limitations are well balanced by two factors: the advantage of having estimates from a population-based sample representative of the US population and the opportunity to examine use/abuse patterns of several drugs by homosexually experienced men and women.

Overall, we observed evidence for higher rates of drug use among homosexually experienced adults compared to those who were exclusively heterosexually active. This difference was greatest for marijuana use but was also evident for several classes of drugs. Prolonged use of marijuana can have negative effects on the lungs (Tashkin *et al.* 2002). At the same time, our findings suggest that these higher rates of drug use do not also imply a high level of dysfunctional use, with the exception of a few drugs (marijuana, and for women, cocaine and possibly hallucinogens). These results, combined with those of previous studies, provide ample evidence that gay men and lesbians tend to use drugs at higher rates than their heterosexual counterparts. Research geared toward helping substance abuse health-care providers understand better the origins or influencing factors in this heavier use is needed. It is more than probable that a reduction in the rate of dysfunctional substance use among gay men and lesbians will require multi-faceted intervention approaches that are gender-, age- and subgroup-specific.

Specific attention to hallucinogen use by young lesbians is clearly warranted.

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