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Prevalence of HIV-Related Self-Reported Sexual Behaviors, Sexually Transmitted Diseases, and Problems With Drugs and Alcohol in Three Large Surveys of Lesbian and Bisexual Women: A Look Into a Segment of the Community

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The majority of reported AIDS cases among women who have sex with women have been attributed either to behaviors associated with injection drug use or to sexual activity with men (Chu, Hammet, & Buehler, 1992). However, little is known about the demographic predictors of substance use or heterosexual sexual behavior among lesbian and bisexual women. Using data from three large studies conducted in the past decade surveying over 8,500 lesbian and bisexual women, we examined predictors of recent sex with men, reports of alcohol and drug problems, and self-reported vaginal infections and sexually transmitted diseases (STDs). Results demonstrate that reports of sex with men in the prior year were associated with (a) indicating a bisexual, in contrast to lesbian, sexual orientation; (b) being of younger age; (c) being single, as opposed to being in a lesbian relationship; and (d) reporting less education. Drug use, including needle drugs, crack or cocaine, and heroin, was related to reporting lower educational attainment. Self-reported histories of problems with alcohol correlated with lower levels of education, less income, and older age. Finally, self-reported lifetime prevalence of vaginal infections and other STDs was positively related to a history of crack or cocaine use, a drug problem history, and sexual contact with men. Findings underscore the importance of both drug use and histories of sex with men in understanding risk for STDs among lesbian and bisexual women.

Key words: lesbian, bisexual, sexual behavior, drug use, STD, HIV, ethnic minorities, African-American, Black

Research to date has focused on the risk of human immunodeficiency virus (HIV) infection for lesbian and bisexual women from behaviors associated with injection drug use (needle sharing) and sexual contact with men (Chu et al., 1992; Petersen et al., 1992; Raiteri et al., 1994). Reports of female-to-female sexual transmission of HIV (Marmor et al., 1986; Monzon & Capellan, 1987; Rich, Buck, Tuomala, & Kazanjian, 1993; Sabatini, Patel, & Hirschman, 1984) are found infrequently in the scientific literature. Although the methodology underlying these studies may underestimate risk from female-to-female sexual transmissions (Kennedy, Scarlett, Duerr, & Chu, 1995; Stevens, 1993) because many lesbians report histories of having had sex with men at some time in their lives (Bell & Weinberg, 1978; O'Hanlan, 1995; Peplau, Cochran, Rook, & Padesky, 1978) and that may obscure female-to-female transmission incidents (Rich et al., 1993), the existing epidemiologic evidence does suggest that HIV risk for women who have sex with women (WSW) might be more likely to accrue via behaviors only some in this population practice at any given time.

This view is consistent with the concept of core groups (Yorke, Heathcoate, & Nold, 1978). Core groups are open populations with high prevalence of sexually transmitted diseases (STDs) through which individuals migrate (Padian, Shiboski, & Hitchcock, 1991). In the United States, risk factors associated with core group

membership among heterosexuals include younger age, multiple sexual partners, inner-city residence, ethnic minority background, poverty, drug use, and sex work (Brunham & Ronald, 1991; Padian et al., 1991).

Applying a core group conceptualization to risk of HIV among the population of lesbian and bisexual women implies that HIV and possibly some other STD infections may be concentrated among women who share a common set of demographic and behavioral characteristics. Some of these factors and their correlates may be identical to those that have already been identified as conferring STD core group membership in studies of heterosexual populations. However, there may be other important factors that are unique to the population.

One obvious difference between heterosexual populations and the population of WSW is that heterosexual sexual activity is practiced by some, but not all, women at any one time (Bell & Weinberg, 1978; Cochran & Mays, 1996; Einhorn & Polgar, 1994; Mays, Cochran, Pies, Chu, & Ehrhardt, 1996; Reinisch, Sanders, & Ziemba-Davis, 1995; Stevens, 1994). Being heterosexually active appears to confer on these women risk for HIV (Chu et al., 1992) and perhaps some other STDs. Specifically, STDs, such as syphilis or gonorrhea, are rare among lesbians unless women also report prior sexual behavior with men (Edwards & Thin, 1990; O'Hanlan, 1995). In contrast, bacterial vaginosis or trichomonas infections are not uncommon because they probably can be transmitted efficiently by female-to-female sexual behavior (Berger, Kolton, Cummings, Feldman, & McCormack, 1995; O'Hanlan, 1995; Sivakumar, De Silva, & Roy, 1989).

Predictors of heterosexual sexual behavior in this population are not well established. It is known that self-rated sexual orientation predicts heterosexual sexual behavior such that women who consider themselves to be lesbian are much less likely than those who view themselves as bisexual to report recent sex with men (Bell & Weinberg, 1978; Cochran & Mays, 1996; Lemp et al., 1995). Few other correlates have been determined. Stevens (1994), using qualitative data from interviews of lesbian and bisexual women, reported that drug use, particularly crack and alcohol use, was associated with occasions of having sex with men. Finally, Lemp et al. (1995) found that younger women, in contrast to older women, were more likely to report recent sex with men.

Over the last 15 years, several large surveys of lesbian and bisexual women have been conducted exploring, among other issues, prevalence of both homosexual and heterosexual sexual behaviors, problems with drug and alcohol use, and prevalence of self-reported STDs (Bradford, Ryan, & Rothblum, 1994; Bybee, 1990; Einhorn & Polgar, 1994; Lever, 1995; Mays & Cochran, 1988; Smith, Johnson, & Guenther, 1985). Although none of these studies represent population-based sampling from the universe of WSW, they do offer a unique opportunity to examine, across several large surveys, possible correlates of higher risk behaviors among women who consider themselves lesbian or bisexual. In this article, we present parallel findings from three of those surveys (the Michigan Lesbian Health Survey [MLHS], the

National Lesbian and Bisexual Women's Health Survey [NLBWHS], and the National Black Lesbian Survey [NBLS]).

We examine possible demographic and behavioral factors that might predict being at higher risk for HIV and other STDs. Drawing from the existing literature, we expected that core group demographic characteristics identified elsewhere, such as younger age and lower socioeconomic status (Brunham & Ronald, 1991; Padian et al., 1991), would predict greater prevalence of drug use and higher risk sexual behavior (defined here as sex with men and multiple female sexual partners). We also predicted, based on previous findings (Bell & Weinberg, 1978; Einhorn & Polgar, 1994; Reinisch et al., 1995; Stevens, 1994), that self-rated sexual orientation would be related to reports of recent heterosexual sexual activity, although it is not a perfect predictor. Finally, we hypothesized that these demographic factors and higher risk behaviors would be related to self-reports of STDs. Our hope is to begin to identify characteristics associated with higher HIV and STD risk among the population of WSW. Better identification of demographic and behavioral factors associated with those women most likely to engage in HIV-related risk behaviors may help us to tailor both HIV and general STD prevention interventions to those lesbian and bisexual women most at risk.

METHOD

Overview

Although each of the three datasets described more fully below represent independent efforts at collecting information from WSW, all have several properties in common (see Table 1). First, the target population was WSW, although two of the surveys further limited that population by geography or ethnic/racial background. Second, information was collected from volunteers, accessed via lesbian community networks or community-related public events, who completed self-report questionnaires, thereby limiting the study populations to women who can be reached via these methods. Third, the three samples represent some of the largest surveys of lesbian and bisexual women that have been conducted in the past decade. Fourth, each survey, in part, addressed questions of sexual behavior and other factors that might be associated with risk for HIV infection.

Descriptions of Individual Studies

Michigan Lesbian Health Survey. In 1989, 60 lesbian and other organizations and individuals in Michigan distributed a 12-page questionnaire assessing lesbian health issues. Nearly half were distributed by mail, 17% at public lesbian

TABLE 1
Description of the Three Lesbian Surveys

	Michigan Lesbian Health Survey	*National Lesbian Bisexual Women's Health Survey*	*National Black Lesbian Survey*
Target population	Lesbians, bisexual women residing in Michigan	Lesbians, bisexual women in U.S.	African-American women in the U.S. who have sex with women
Time period of data collection	1989	1993	1985
Method of recruitment	Mailings to community lists, distribution to businesses, individuals	Distributions to individuals at gay marches, mailings to community groups, insertion in lesbian newspaper	Mailings to community lists, distribution to community members
Inclusion criteria	Lesbians, bisexual women, or women who have a history of sex with women and reside in Michigan	Lesbian or bisexual identity or denies absence of gay sex	African-American, female, and reports sex with at least one woman
Survey instrument	Mail-in questionnaire	Mail-in questionnaire	Mail-in questionnaire
Sample size	1,681	6,243	605
Geographic participation	100% from Michigan	48 states, 33% from California	32 states, 47% from California

events, and 23% through gay businesses, bars, and churches. Approximately 10% were distributed via snowball technique in the hopes of reaching women who did not participate in the community. Women completed the anonymous questionnaires, returning the instrument in preaddressed, prestamped envelopes to the study project. Inclusion criteria for the study were residency in the state of Michigan and self-identification as a lesbian or bisexual woman or history of any sexual experience with another woman. In all, usable questionnaires were returned from 1,681 women (for fuller discussion of study methods see Bybee, 1990). Included in the instrument, and used in the current study, are questions concerning sexual behavior, self-reported lifetime prevalence of STDs including HIV, and drug and alcohol use patterns including history of injection drug use in the prior 3 years.

National Lesbian and Bisexual Women's Health Survey. This two-page survey on women's health was distributed in 1993 at public lesbian- and gay-oriented marches, through national mailings to lesbian organizations, and by insertion in a Los Angeles-based lesbian newspaper (Gage, 1995). Women completed the survey, including, if they wished, their identifying information. The instrument was then folded to expose a printed return address with a prepaid mailing permit. Questionnaires were returned by 6,264 women. For this study, those who indicated either a lesbian or bisexual sexual orientation or reported that they had had sex with women were considered to have met inclusion criteria. This resulted in 6,243 usable questionnaires. Included in the instrument, and used in this study, were items assessing sexual behavior, self-reported lifetime prevalence of STDs including HIV, and lifetime prevalence of drug addiction and alcoholism.

National Black Lesbian Survey. Anonymous questionnaires were collected from 605 women recruited nationally. All reported being African-American, female, and having engaged in sex with another woman at least once. Women were recruited from local and national gay organizations, through press announcements in gay publications, and through the social networks of other study participants. Women completed lengthy questionnaires addressing a variety of topics of concern to African-American lesbians and returned them in prestamped, preaddressed envelopes (for a fuller discussion of study methods see Cochran & Mays, 1994; Mays & Cochran, 1988; Peplau, Cochran & Mays, 1996). Included in the questionnaire were questions concerning sexual behavior and difficulties with drug or alcohol use. These were used in this study.

Variables and Coding of Comparable Items

Because each study was developed independently, questions addressing the same topic were sometimes asked in highly similar, but slightly different formats. In

addition, sometimes topics relevant to this article were addressed in one or two studies but not all. Every effort has been made to code variables for comparability and similarity of intent. Interested readers can contact Susan D. Cochran for a complete description of how questions were asked in each study and the specific coding decisions made.

Demographics. All three surveys assessed women's age, ethnic/racial background, educational attainment, lesbian relationship status, parity, sexual orientation, and income. Because the NBLS's income categories on the original survey could not be matched exactly to the income categories of the other two surveys, we note that in this article the under-$10,000 category actually includes women from the NBLS who reported less than $9,000 in income, whereas the $10,000–$14,999 category includes NBLS women earning $9,000–$14,999.

Sex with women. The three studies asked women if they had ever had sex with another woman, leaving each respondent to self-define what behaviors that encompassed. Due to studies' inclusion criteria, all heterosexually identified women reported having had sex with women. In addition, the NBLS dropped from further consideration the small number of lesbian and bisexual women who did not report sexual experiences with women. Both the NLBWHS and the NBLS asked at what age women first knew that they were attracted to other women, and all studies asked at what age women first had sex with another woman. Finally, the MLHS asked women how many female sexual partners they had during the past year.

Sexual contact with men. Both the MLHS and the NBLS asked participants directly if they had ever had sex with a man. All surveys asked questions about recent male sex partners permitting classification of those women who reported sex with men within the prior 12 months or not.

Vaginal infections and sexually transmitted diseases. Both the MLHS and the NLBWHS, but not the NBLS, asked about histories of vaginal infections and STDs. Though some diseases, for example, gonorrhea or syphilis, are clearly STDs, the same may not always be true for vaginal infections (Johnson, 1990). In this article, vaginal infections are considered as a separate entity.

Alcohol and drug problems. All surveys assessed, in a variety of ways, problems with alcohol or drug use. The MLHS asked women if they had ever had an alcohol problem or any "other drug problem." In contrast, the NLBWHS asked women if they had a history of alcoholism and, in a separate question, a history of drug addiction. We treated these questions as essentially equivalent. The NBLS asked women how frequently they had used drugs or alcohol to make themselves

feel better in the past year. Women who reported doing so "often" or "most of the time" were considered as having a problem with drug or alcohol use. In addition, the MLHS and the NLBWHS asked women about current and past use of individual drugs. We report prevalence of crack or cocaine use and heroin use, the latter because of its close association with injection drug use. Finally, only the MLHS specifically asked women if they had used illegal/street needle drugs.

Data Analyses

In conducting analyses, we limit ourselves to presenting 95% confidence intervals (CIs) of point estimates derived independently within each study and the results of parallel stepwise logistic regression analyses also performed independently across studies. Data were analyzed using the SAS (1988) and BMDP (1992) statistical packages. Stepwise logistic regression equations procedures were used to identify demographic predictors of recent sexual behavior with men; needle drug use; crack, cocaine, or heroin use; and reports of drug or alcohol problems. Stepwise logistic regression was also used to evaluate the possible contributions of demographic factors, sexual histories, and substance use as risk factors for self-reported STDs and vaginal infections. In all instances, model fit of the regression equations was evaluated by the goodness of fit χ^2. All equations reported are consistent with model fit, $p > .05$.

This conservative approach of treating each survey as an independent estimate of a parameter of interest reflects our inability to meet fundamental assumptions that measurement error across studies is distributed randomly (some women may have participated in more than one survey), that identical constructs have been measured in all instances, and that the target populations are identical (Hosmer & Lemeshow, 1989).

In comparing CIs of point estimates across surveys, we remind the reader that given that none of these studies reflect population-based sampling, the CI does not remove the problem of sampling bias in the estimates (Levy & Lemeshow, 1991). Therefore, similarity of estimates across studies may reflect similarity of bias as well as centering around a true population parameter estimate. Conversely, differences across the studies may be the result of methodological differences as well as differences in true population parameters.

RESULTS

Characteristics of the Samples

As shown in Table 2, despite differing methods of sample recruitment, geographic diversity, and study instrument, demographic characteristics of the three studies

TABLE 2
Demographic Characteristics of the Three Lesbian Surveys

	Michigan Lesbian Health Survey[a]		*National Lesbian Bisexual Women's Health Survey*[b]		*National Black Lesbian Survey*[c]	
Characteristic	*N*	%	*N*	%	*N*	%
Sexual orientation						
Lesbian	1,436	86.1	5,236	87.2	506	83.6
Bisexual	228	13.7	744	12.4	66	10.9
Other/heterosexual	3	0.2	24	0.4	33	5.5
Age						
Under 25 years	169	10.1	721	11.8	72	12.0
25 to 29	345	20.7	1,025	16.7	146	24.2
30 to 34	344	20.6	1,259	20.6	156	25.9
35 to 39	335	20.1	1,160	18.9	113	18.8
40 to 49	371	22.2	1,473	24.0	92	15.3
50 to 59	83	5.0	403	6.6	22	3.6
60 or older	22	1.3	86	1.4	1	0.2
Ethnic/racial background						
White	1,529	91.5	5,415	87.7	0	0.0
Black	58	3.5	226	3.7	605	100.0
Hispanic	29	1.7	151	2.4	0	0.0
Asian-American	6	0.4	76	1.2	0	0.0
Native American	24	1.4	62	1.0	0	0.0
Other/multiple	25	1.5	244	4.0	0	0.0
Education						
High school or less	158	9.5	429	7.0	77	12.8
Some college	453	27.2	1,477	24.0	241	40.2
College degree	378	22.7	1,796	29.2	179	29.3
Graduate school	678	40.7	2,449	39.8	103	17.2
Annual income						
Under $10,000[d]	303	18.4	1,040	16.9	122	20.5
$10,000 to $14,999[d]	219	13.3	555	9.0	125	21.0
$15,000 to $19,999	204	12.4	576	9.4	112	18.9
$20,000 to $29,999	433	26.2	1,310	21.3	147	24.7
$30,000 to $39,999	296	17.9	1,089	17.7	55	9.3
Over $40,000	196	11.9	1,582	25.7	33	5.6
Relationship status						
In lesbian relationship	1,124	67.8	4,200	67.3	399	66.0
Has 1 or more children	306	18.3	954	15.3	208	34.4

Note. Percentages based on nonmissing data; sums to 100% except for rounding error.
[a]*N* = 1,681. [b]*N* = 6,243. [c]*N* = 605. [d]In the National Black Lesbian Survey, categories are under $9,000 and $9,000 to $14,999 per year.

were quite similar. Most women self-identified as lesbians, ranging from nearly 84% of women in the NBLS study (CI = 80.7%–86.6%) to 87% (CI = 86.4%–88.0%) of women in the NLBWHS. All three studies also recruited samples of similar ages. Participants in the MLHS reported a mean age of 35.0 years (*SD* = 9.0), in the NLBWHS a mean age of 35.6 years (*SD* = 9.5), and in the NBLS a mean age of 33.2 years (*SD* = 7.7). Across studies, few participants were under age 25, and fewer still were older than 50 years. This may reflect the fact that for all of these studies recruitment commonly relied on whether or not women were active to some degree in public settings that are associated with the lesbian community. With the exception of NBLS, most participants were White women. Educational levels were high for all of the samples, perhaps reflecting either volunteer bias (Rothman, 1986) or the reading demands of the study instruments. However, income levels appeared to differ, with over 60% of women in the NBLS reporting annual incomes under $20,000 per year. In contrast, only 35% of women in the NLBWHS and 44% of women in the MLHS reported incomes at this level. To some extent, this may reflect the fact the NBLS was conducted 8 years earlier than the NLBWHS. Approximately two thirds of all the women sampled reported being in a current lesbian relationship. Thus, the majority of the 8,529 respondents in these surveys represent a segment of the lesbian and bisexual community that is well educated, generally neither very young nor over age 50, in lesbian relationships, and lesbian-identified. Ethnic minorities, with the exception of some segments of the population of Black lesbian and bisexual women, are most likely underrepresented.

Patterns of Sexual Behaviors

Not surprisingly, given the inclusion criteria of the studies, virtually all women reported having had sex with women at some time in their lives (see Table 3). In both the NLBWHS and the NBLS, women were also asked how old they were when they first realized that they were attracted to women. For many women, this awareness happened early in life, even before the onset of puberty. In the NLBWHS, approximately 39% of women (CI = 37.5%–40.0%) reported that they were under the age of 16 when such awareness occurred. In the NBLS, 56% (CI = 52.3%–60.3%) of participants reported a similar experience. The surveys also asked women how old they were when they first had sex with another woman. Across the studies, approximately 45% of women reported doing so before the age of 20 (for the MLHS, CI = 41.5%–46.3%; for the NLBWHS, CI = 43.4%–45.9%; for the NBLS, CI = 48.0%–56.0%).

Each survey, to some extent, also assessed prevalence of heterosexual sexual behavior. Both the MLHS and the NBLS asked women directly if they had ever had sex with a man. Most women indicated that they had (for the MLHS, CI =

TABLE 3
Prevalence of Sexual Behaviors Among Lesbian and Bisexual Women in Three Surveys

	Michigan Lesbian Health Survey[a]		*National Lesbian Bisexual Women's Health Survey*[b]		*National Black Lesbian Survey*[c]	
Behavior	*N*	%	*N*	%	*N*	%
Sex with women, ever	1,654	99.2	6,204	99.4	605	100.0
Age first attracted to women						
Under 12 years	—		1,086	19.0	149	25.3
12 to 15	—		1,129	19.8	182	31.0
16 to 19	—		1,438	25.2	116	19.7
20 to 24	—		1,048	18.3	75	12.8
25 to 29	—		484	8.5	36	6.1
30 to 39	—		403	7.0	22	3.7
40 or older	—		126	2.2	8	1.4
Age first sex with a woman						
Under 12 years	50	3.0	227	3.8	66	11.1
12 to 15	174	10.6	592	10.0	88	14.8
16 to 19	496	30.3	1,820	30.8	165	27.8
20 to 24	486	29.6	1,833	31.0	158	26.6
25 to 29	206	12.6	725	12.3	63	10.6
30 to 39	185	11.3	553	9.4	46	7.7
40 or older	42	2.6	164	2.8	8	1.4
No. of female sex partners, past year						
0	166	10.0	—		—	
1	1,093	65.9	—		—	
2	209	12.6	—		—	
3 or more	190	11.5	—		—	
Sexual contact with men						
Sex with men, ever	1,318	79.0	—		547	90.7
Male sex partner in past year	141	8.4	758	12.1	101	16.7

Note. Percentages based on nonmissing data; sums to 100% except for rounding error; questions not asked indicated by dashes.
[a]N = 1,681. [b]N = 6,243. [c]N = 605.

77.1%–90.0%; for the NBLS, CI = 88.4%–93.0%). Sexual behavior with men in the prior year was also reported by a small, but sizable proportion of women. In the MLHS, approximately 8% of the sample (CI = 7.1%–9.7%) indicated that they had sex with a man within the prior year. In the NLBWHS, approximately 12% of women (CI = 11.1%–12.8%) reported doing so. Finally, in the NBLS, nearly 17% of women (CI = 13.7%–19.7%) reported having sex with a man in the prior year.

In order to examine possible demographic characteristics of women who reported recent sex with men, stepwise logistic regression equation models were evaluated separately for each study. Reports of sex with men in the prior year were regressed on demographic characteristics, including sexual orientation, age, relationship status, income, level of education, and ethnic background (except for the NBLS). Results of these parallel analyses are reported in Table 4. As can be seen, across all three studies similar predictors emerged. Both bisexual women and women classified as "other/heterosexual" were significantly more likely than lesbians to report engaging in sex with men. Indeed, whereas somewhere between 29% and 54% of bisexual women, depending on the study, reported sex with men in the prior year, rates among self-identified lesbians ranged from 5% to less than 11% (for the MLHS, 5.0%, CI = 3.9%–6.1%; the NLBWHS, 6.0%, CI = 5.4%–6.6%; the NBLS, 10.5%, CI = 7.8%–13.1%). Also, across the studies, the odds of reporting sex with men was significantly associated with being of younger age and not being in a relationship with another woman. In the MLHS only, lower levels of educational attainment also predicted reporting sex with men in the prior year. Ethnic/racial background did not significantly predict reports of recent sex with men across the two studies with ethnically mixed samples, though prevalence estimates in the NBLS, when contrasted to the other studies, suggest the truth may lie elsewhere. These differences in prevalences suggest that Black lesbians may be more likely than lesbians in general to be heterosexually active.

Prevalence of Drug and Alcohol Use

A sizable minority of women in the MLHS and NLBWHS reported current or past use of either crack, cocaine, or heroin. Among MLHS participants overall, 2.9% (CI = 2.1%–3.7%) reported current use of crack or cocaine and an additional 25.5% (CI = 23.7%–27.9%) indicated that they had used these drugs in the past. Reported lifetime prevalence of crack and cocaine use varied by age with 30.4% (CI = 24.2%–36.5%) of those between 18 to 25 years old, 39.1% (CI = 35.3–42.9%) of those aged 26 to 34 years, and 19.7% (CI = 17.0%–22.5%) of women aged 35 or older reporting ever using crack or cocaine. Similarly, among NLBWHS participants, 4.8% (CI = 4.3%–5.4%) reported that they were current users of crack or cocaine and an additional 15% (CI = 14.1%–15.9%) indicated former use. Lifetime prevalence varied by age with 12.0% (CI = 9.9%–14.2%) of 18 to 25 year olds, 25.5% (CI = 23.7%–27.4%) of 26 to 34 year olds, and 18.2% (CI = 16.8%–19.6%) of women aged 35 or older reporting ever using crack or cocaine. In contrast, reports of heroin use were less frequent. In the MLHS, 3.5% (CI = 2.6%–4.4%) reported ever using heroin, whereas in the NLBWHS, 3.0% (CI = 2.6%–3.4%) did. Finally, few women (0.5%, CI = 0.2%–0.9%) in the MLHS reported needle drug use in the past 3 years.

TABLE 4
Correlates of Lesbian and Bisexual Women's Sex With Men in Prior Year: Results of Stepwise Logistic Regression Analyses—Odds Ratios (OR) and 95% Confidence Intervals (CI)

	Michigan Lesbian Health Survey			*National Lesbian Bisexual Women's Health Survey*			*National Black Lesbian Survey*		
Correlate	*Step Entered*	*OR*	*95% CI*	*Step Entered*	*OR*	*95% CI*	*Step Entered*	*OR*	*95% CI*
Sexual orientation[a]	1			2			1		
Bisexual		8.5	5.6–13.1*		13.7	11.3–16.7*		12.8	6.9–23.8*
Other/heterosexual		54.0	3.2–920.0*		27.1	10.9–67.0*		5.3	2.26–12.6*
Age (older)	2	.62	.53–.72*	3	.88	.83–.94*	2	.66	.54–.80*
Lesbian relationship status									
In relationship	3	.28	.18–.41*	1	.60	.50–.72*	3	.59	.35–.97*
Education (more)	4	.74	.60–.91*	*ns*			*ns*		

Note. *ns* = improvement chi-square nonsignificant, $p > .05$; variable not entered in final equation. OR and 95% CI represent final estimates. Variables considered for entry included sexual orientation, age, relationship status, income, education, and ethnic/racial background (except for the National Black Lesbian Survey). Variables not shown did not enter into final equation.

[a]Reference is lesbian.

*$p < .05$.

A sizable minority of women in the three studies also reported histories of drug or alcohol problems. A history of drug problems was reported by 11.4% (CI = 9.8%–12.9%) of women in the MLHS and 9.2% (CI = 8.4%–9.9%) of women in the NLBWHS, whereas 18.7% (CI = 16.8%–20.5%) of the MLHS sample and 13.7% (CI = 12.9%–14.6%) of the NLBWHS sample reported a history of problems with alcohol use. In the NBLS, 18% (CI = 15.0%–21.1%) of women reported problems with alcohol or drug use in the past year.

Results of stepwise logistic regression analyses predicting histories of drug or alcohol problems and needle use from demographic characteristics are shown in Table 5. Across the MLHS and NLBWHS, lower levels of education were associated with both positive histories of drug and alcohol problems as well as recent needle use and use of crack, cocaine, or heroin. In both the NLBWHS and the MLHS, use of crack or cocaine was also associated with age. In the MLHS only, reporting a bisexual or other/heterosexual sexual orientation, and in the NLBWHS, reporting a higher income, predicted a positive history of crack or cocaine use. In contrast, in the MLHS, a positive history of drug problems was significantly related to lower current income as well as lower levels of education. Reporting a positive history of problems with alcohol was significantly associated with less education, older age, and lower income in both the MLHS and the NLBWHS. Finally, in the NBLS, reporting frequent use alcohol or drugs in the prior year was associated solely with lower income. Thus, overall it appears that drug and alcohol use is consistently associated with lower levels of educational attainment and, generally, income.

Self-Reported Prevalence of STD's

Reports of prevalent HIV infection were few. In the MLHS, no one reported being HIV infected, even though 18% of women in the sample indicated that they had an HIV antibody test at some point in their lives. In the NLBWHS, which did not ask women about HIV testing experiences, only 7 women (.11%, CI = .03%–.20%) self-reported prevalent infection. Three were women who identified as lesbian, did not give evidence of sexual activity with men, but did report a positive history of drug addiction or heroin use. Three were women who considered themselves bisexual and reported positive histories of sex with men, two within the prior year. And one was a woman who did not label her sexual orientation but did report both sex with men at some time in the past and a history of drug and alcohol addiction.

In contrast, reports of prior yeast infections were relatively common. In the MLHS, 20.6% (CI = 18.5%–22.4%) of women reported having had a repeated or longterm vaginal infection, whereas 32.6% (CI = 31.5%–33.8%) of NLBWHS participants reported a positive history of vaginal infection. However, reports of other infections more clearly linked to sexual transmission were much less frequent.

TABLE 5
Correlates of Drug and Alcohol Use Histories Among Lesbian and Bisexual Women: Results of Stepwise Logistic Regression Analyses—Odds Ratio (OR) and 95% Confidence Intervals (CI)

	Michigan Lesbian Health Survey			*National Lesbian Bisexual Women's Health Survey*			*National Black Lesbian Survey*		
Correlate	*Step Entered*	*OR*	*95% CI*	*Step Entered*	*OR*	*95% CI*	*Step Entered*	*OR*	*95% CI*
Needle use in past 3 years									
Education (more)	1	.29	.13–.68*						
Crack/cocaine use—ever									
Age[a]	1			1					
25 to 29 years		1.68	1.12–2.51*		2.18	1.61–2.94*			
30 to 34 years		1.54	1.02–2.31*		3.39	2.54–4.53*			
35 to 39 years		1.19	.79–1.81		2.83	2.09–3.83*			
40 or older		.37	.24–.57*		1.50	1.11–2.03*			
Education (more)	2	.81	.72–90*	2	.74	.71–.81*			
Sexual orientation[b]									
Bisexual or other	3	1.61	1.18–2.20*	*ns*					
Income	*ns*			3	1.06	1.01–1.10*			
Heroin use—ever									
Education (more)	1	.64	.49–.82*	1	.58	.50–.67*			
Problems with drugs—lifetime prevalence									
Education (more)	1	.76	.65–.88*	1	.56	.51–.62			
Income (higher)	2	.89	.80–.98*	*ns*					
Problems with alcohol—lifetime prevalence									
Education (more)	1	.82	.72–.94*	1	.70	.65–.76*			
Age (older)	2	1.19	1.08–1.30*	2	1.09	1.03–1.15*			
Income (higher)	3	.91	.84–1.00*	3	.94	.90–.99*			
Problems with alcohol or drugs in past year									
Income (higher)							1	.82	.71–.96*

Note. *ns* = improvement chi-square nonsignificant, $p > .05$; variable not entered in final equation. OR and 95% CI represent final estimates. Variables considered for entry included sexual orientation, age, relationship status, income, education, and ethnic/racial background (except for the National Black Lesbian Survey, Asian-Americans coded as other/multiple). Variables not shown did not enter into final equation.

[a]Referent is under 25 years of age. [b]Referent is lesbian.

*$p < .05$.

The most prevalent STD reported was genital warts (in the MHLS, 4.7%, CI = 3.7%–5.7%; in the NLBWHS, 5.8%, CI = 5.2%–6.4%), followed by genital herpes (MHLS, 2.3%, CI = 1.6%–3.0%; NLBWHS, 5.2%, CI = 4.7%–5.8%), and chlamydia (MHLS, 2.0%, CI = 1.4%–2.7%; NLBWHS, 5.1%, CI = 4.5%–5.6%). Very few women reported having ever had gonorrhea or syphilis (MHLS, 1.4%, CI = 0.8%–1.9%; NLBWHS, 2.9%, CI = 2.5%–3.4%).

In Table 6, we present results of stepwise logistic regressions using demographic factors, sexual behavior histories, and reports of substance and alcohol use to predict reports of vaginal infections and other STDs, including HIV. Given that the temporal sequence of behavior and infection cannot be determined, our intention is not to identify causes of vaginal infections or STDs, but rather to examine possible demographic and behavioral correlates. In these analyses, age was treated as a categorical variable reflecting the fact that its association with both reports of vaginal infections and STDs was not linear.

In the MLHS and the NLBWHS, both sex with men and positive drug histories were significant predictors of reports of previous vaginal infections. In the NLBWHS, reporting having used crack or cocaine was also a significant correlate of having had a past vaginal infection. In that same study, women between the ages of 30 and 49 years were more likely to report having had an infection than younger women, reflecting either greater opportunity to experience an incidence of infection or an age cohort effect.

Similar predictors emerged for reports of a previous STD. As with vaginal infections, either alcohol use or, in the case of the MLHS, numbers of female sexual partners in the prior year, did not significantly predict reports of having had an STD. Instead, for both the MLHS and the NLBWHS, sex with men, prior crack or cocaine use, or a history of drug problems were significant correlates of reporting having had an STD. For the MLHS, specifically, reporting sex with men ever and in the past year, crack or cocaine use, more education, and lower current income were significantly related to reports of positive STD histories. Similarly, in the NLBWHS, reporting ever using crack or cocaine; indicating a bisexual, as opposed to lesbian, sexual orientation; being between the ages of 30 and 49, as opposed to being under age 30; reporting a history of drug addiction; and sex with men in the prior year were significant predictors of self-reported positive STD histories. Also, women's ethnic/racial background was associated with lifetime prevalence of STDs such that Black women were more likely and Asian-American women were less likely than White women to report having had an STD in the past.

DISCUSSION

Results reported here provide support for conceptualizing risk for HIV and some other STD infections from a core group perspective (Brunham & Ronald, 1991;

TABLE 6
Correlates of Self-Reported Vaginal Infections and Sexually Transmitted Diseases Among Lesbian and Bisexual Women: Results of Stepwise Logistic Regression Analyses—Odds Ratios (OR) and 95% Confidence Intervals (CI)

	Michigan Lesbian Health Survey			*National Lesbian Bisexual Women's Health Survey*		
Correlate	*Step Entered*	*OR*	*95% CI*	*Step Entered*	*OR*	*95% CI*
Vaginal Infections[a]						
Sex with men, ever	1	1.64	1.18–2.29*	*na*		
Recent sex with men	*ns*			1	2.06	1.76–2.42*
History of crack/cocaine use	*ns*			2	1.47	1.28–1.69*
Age[b]	*ns*			3		
30 to 49					1.48	1.30–1.68*
50 or over					1.01	.80–1.28
History of drug problems	2	1.46	1.05–2.10*	4	1.33	1.10–1.60*
Other sexually transmitted diseases						
Sex with men, ever	1	5.50	2.39–2.17*	*na*		
History of crack/cocaine use	2	1.98	1.38–2.83*	1	1.77	1.50–2.11*
Education (more)	3	1.45	1.20–1.77*	*ns*		
Income (greater)	4	.87	.77–.97*	*ns*		
Sexual orientation[c]	*ns*			2		
Bisexual					1.85	1.48–2.31*
Other/heterosexual					1.00	.33–3.05
Age	5			3		
30 to 49		1.35	.89–2.06		1.50	1.26–1.79*
50 or over		.28	.06–1.22		.99	.70–1.39
History of drug problems	*ns*			4	1.65	1.32–2.06*
Recent sex with men	6	1.77	1.05–2.96*	5	1.48	1.18–1.86*
Ethnic background[d]	*ns*			6		
Black					1.48	1.03–2.11*
Hispanic					.78	.47–1.30
Asian-American					.31	.11–.86*
Native American					1.09	.52–2.25
Other/multiple					1.38	.98–1.95

Note. *ns* = improvement chi-square nonsignificant, $p > .05$, variable not entered in final equation; *na* = not measured. OR and 95% CI represent final estimates. Variables considered for entry included sexual orientation, age, income, education, ethnic/racial background, history of crack/cocaine use, history of heroin use, needle drug use (Michigan Lesbian Health Survey [MLHS] only), history of drug problem, history of alcohol problem, sex ever with men (MLHS only), sex with men in prior year, and number of female sex partners in past year (MLHS only). Variables not shown did not significantly improve fit of the equations.

[a]MLHS described infection as repeated or long-term. [b]Referent age is under 30 years. [c]Referent is lesbian. [d]Referent is White ethnic/racial background.
*$p < .05$.

Padian et al., 1991) in which a subpopulation of women who share certain demographic and behavioral characteristics are more likely to evidence patterns of behavior that place them at much greater risk for incident infections than the total population of WSW. For lesbians, the most frequently documented risk factor for HIV infection is injection drug use (Chu et al., 1992). In the MLHS, reports of injection drug use appear consistent with a national survey of needle use among women in the general population (Substance Abuse and Mental Health Services Administration [SAMHSA], 1995). This suggests both that lesbian and bisexual women might be no more likely than women in general to use needle drugs and that injection drug use is a relatively infrequent, although important risk behavior within the total population. At the same time, however, self-reports of heroin and crack or cocaine use by the women studied here appear greater than population estimates for women in general (SAMHSA, 1995). Using estimates derived from the 1994 National Household Survey on Drug Abuse (SAMHSA, 1995), we would expect that 8.2% (CI = 7.3%–9.1%) of women would have used cocaine at least once, 1.3% (CI = 1.1%–1.6%) crack, and 0.4% (CI = 0.3%–0.6%) heroin. But in the MHLS and NLBWHS combined, 22% of women reported having used crack or cocaine and 3% heroin. Even after stratifying by age, reports of crack, cocaine, and heroin use were greater in these two samples than population estimates for women in general. Thus, although use of these drugs is reported by a minority of women, prevalent use is greater than expected.

One reason to be concerned about this is that, consistent with prior research on risk factors for STDs in general (Padian et al., 1991), histories of drug problems and crack or cocaine use repeatedly were associated with self-reported positive histories of ever having had an STD or vaginal infection. The principal predictors of drug use across the three surveys reported here were lower levels of educational attainment and generally lower income. This is also consistent with previous research on STD core group characteristics (Padian et al., 1991).

A second major risk factor for HIV among lesbians is heterosexual sexual contact (Chu et al., 1992). We found that reports of sex with men, both lifetime and within the prior 12 months, were positively associated with self-reports of vaginal infections as well as other STDs. As has been noted in previous studies (Bell & Weinberg, 1978, Lever, 1995; O'Hanlan, 1995), most women in the three surveys examined here had sex with men at some time in their lives. But heterosexual activity within the prior year was reported by only 12% of the women studied. Thus, risk accrued from heterosexual sexual activity at any given time appears concentrated in a minority of the population. Few women who considered their sexual orientation to be lesbian (6% of all lesbians surveyed) reported sexual contact with men in the prior year. This is in marked contrast to bisexually identified women of whom 50% reported sex with men in the same time period. Other predictors of recent sex with men were being of younger age, not being in a lesbian relationship, and perhaps having less education. Comparisons of 1 year prevalence of sex with

men across the three studies suggest that Black lesbians may be more likely to be heterosexually active than the other primarily White lesbians surveyed.

These findings suggest that HIV prevention efforts targeting risk from heterosexual sexual activity might be most effective if focused on younger women, particularly those who do not consider themselves to be lesbians (Cochran & Mays, 1996). If as suggested here in these three studies, behavioral bisexuality is more prevalent among African-American lesbians, then greater focus on HIV prevention targeting African-American lesbian and bisexual women is clearly indicated. Unfortunately, women of color from other ethnic groups were underrepresented among the women surveyed in the studies, so we are unable to speculate on what differences or similarities might or might not exist.

Finally, we found no evidence that prevalent HIV infection was common among general samples of lesbian and bisexual women during the period in which this data were collected. In the 1989 MLHS, none of 311 women who had a previous HIV antibody test reported prevalent infection. Similarly, only 7 (.11%) of women in the 1993 NLBWHS reported being HIV infected. These observations echo three other studies that found low to no self-reports of prevalent HIV infection (Cochran & Mays, 1996; Lever, 1995; San Francisco Department of Public Health, 1993) but are at odds with a survey (Lemp et al., 1995) from San Francisco of nearly 500 lesbian and bisexual women recruited from public settings. In that study, 1.2% of women were found to have prevalent HIV infection.

Sampling for the Lemp et al. (1995) survey differs in several important ways from either the MLHS or NLBWHS, underscoring the importance of considering the actual study population in interpreting findings from surveys of lesbian and bisexual women. In the Lemp et al. (1995) sample, just 68% of women considered themselves to be lesbians, 32% of women reported unprotected vaginal or anal sex with men in the prior 3 years, and 10% also reported a history of injecting drugs, 4% within the prior 3 years. This latter prevalence of needle use is eight times greater than that observed in the MLHS.

In contrast, large surveys of generally well educated, partnered, primarily lesbian-identified women, such as the MLHS, NLBWHS, and NBLS, do not sample heavily from this higher risk segment of the community that can be considered the lesbian equivalent of a core group: young women who do not self-identify as lesbians; who have sex with men and women; engage in drug use, particularly needle drugs and crack or cocaine; and who come from ethnic minority backgrounds (particularly, as found here, African-American). Other attributes of core populations not evaluated in this work, due to the nature of the study samples, are probably also important and include residing in innercities, being poor, and bartering sex for money or drugs (Padian et al., 1991). These are the characteristics of the lesbian and bisexual women whom our prevention efforts need especially to target.

In this context, the difference in HIV prevalence between the Lemp et al. (1995) sample and the MLHS and NLBWHS sample is understandable and supports the

view that successful prevention of HIV and STDs among WSW will involve a highly targeted strategy focusing on those women most at risk.

As a final caveat, we wish to reiterate that none of the three studies presented here are random samples of lesbians and bisexual women, despite representing responses from 8,529 women. Though these samples were large and drawn from diverse geographic regions, these women do not represent the total population of WSW, as the Lemp et al. (1995) study demonstrates. They do, however, provide us a unique opportunity to examine risk behaviors in that part of the lesbian population that can be accessed via community networks, and the consistency of findings across the studies supports the reliability of our observations. The voices we hear most come from women who are at ease with completing paper and pencil surveys; who believe that research is valuable to them or the community in general; and who, through behavior or identity, participate in some way within a visible lesbian community. We did not hear very much from the very young or from women over age 50 years. We did not hear from a representative sampling of Latinas, Asian-American, Pacific Islanders, or Native American lesbians. And although the responses from the NBLS were present, it was conducted at a time when many of the issues that confront African American-lesbian and bisexual women today were not yet known; we need to hear yet again from this population. Hopefully, future research will sample more broadly from the population of WSW and will illuminate many of the issues we could only address in a general way.

The next generation of studies of HIV risk in WSW, particularly of lesbians, need to focus not just on the prevalence of risk behaviors, but the contextual dimension of these women's lives that facilitate risk taking or protect women from harm (Mays, Cochran, Pies, Chu, & Ehrhardt, 1996). As in studies of HIV risk in heterosexual women, where we have come to recognize the importance of partner choices, community norms, economic conditions, and psychological trauma and stressors in altering women's risk behaviors (Aral & Wasserheit, 1995; Berer & Ravindran, 1995; Heckman et al., 1995; Mays & Cochran, 1988; Perez, Kennedy, & Fullilove, 1995), further work is needed to understand how these factors in the lives of WSW might facilitate risk for HIV and other STD infection. Results reported here clearly challenge those interested in HIV prevention in lesbians and bisexual women to think creatively about how to determine the prevention needs of these women. All indicators from this study and others (Cochran & Mays, 1996; Lemp et al., 1995) tell us that lesbians and bisexual women who are young, live in poverty in HIV epicenters, engage in the use of addictive drugs, and engage in sex with men are most in need of prevention and intervention efforts. We also know the least about their lives, their social networks, their sources of influence, and how to frame and deliver efficacious prevention messages.

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