



## Prevalence of HIV-Related Sexual Risk Behaviors Among Young 18- to 24-Year-Old Lesbian and Bisexual Women

Susan D. Cochran

*Department of Epidemiology  
School of Public Health  
University of California, Los Angeles*

Vickie M. Mays

*Department of Psychology  
University of California, Los Angeles*

Young lesbian and bisexual women may be at greater risk for human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs) than older lesbian and bisexual women due to sexual experimentation with both men and women (Hunter, Rosario, & Rotheram-Borus, 1993; Reinisch, Sanders, & Ziemba-Davis, 1995) and the generally higher rates of partner change seen among young adults in general (Seidman & Rieder, 1994). We examined prevalence of sexual risk and risk-reduction behaviors in two ethnically diverse (African-American, Asian-American, Latina, and White) samples of lesbian and bisexual women, aged 18 to 25 years, recruited in 1993 ( $N = 181$ ) and 1995 ( $N = 271$ ) from gay pride festivals in Los Angeles County. Women completed brief surveys that assessed both homosexual and heterosexual sexual behavior in the prior year and self-reports of recent sexually transmitted diseases. Results indicate that prevalence of sexual behaviors over the 2-year period was quite stable. Reports of prevalent HIV infection were rare (0.5%), and approximately 7% reported an STD in the prior year. Although few women indicated using protective barriers during sex with other women, rates of partner change were not high, with women reporting 1.0 median number of female sex partners in the prior

year. Nevertheless, 26% of women reported having had sex with men in the prior year, and of these 19% reported sex with a gay man in the prior 3 months. Two-thirds of women who had sex with a gay man were teenagers, and all self-identified as bisexual or something other than lesbian. These findings underscore the need to target HIV prevention services to both bisexual women and teenage women among the population of women who have sex with women.

**Key words:** lesbian, bisexual, sexual behavior, HIV, adolescents, young adults, ethnic minorities, sexually transmitted diseases

Patterns of sexual behaviors among younger lesbian and bisexual women that may put them at risk for human immunodeficiency virus (HIV) infection as well as other sexually transmitted diseases (STDs) have not been well studied (Cochran, Bybee, Gage, & Mays, 1996; Ehrhardt & Wasserheit, 1991), despite the fact that in the United States, individuals under the age of 25 years experience a relatively high incidence of STDs, including HIV infection, compared to other age groups (Division of STD Prevention, 1995). Recent research suggests that lesbians may be especially likely to experiment with heterosexual experiences during late adolescence and young adulthood, thus possibly placing them at some risk for HIV infection (Einhorn & Polgar, 1994; Holland, Ramazanoglu, Scott, Sharpe, & Thomson, 1992; Lemp et al., 1995; Reinisch et al., 1995). Some women who self-identify as lesbians may have sex with men (Chu, Hammett, & Buehler, 1992; Kennedy, Scarlett, Duerr, & Chu, 1995; Reinisch et al., 1995). Alternatively, some women who self-identify as bisexual may have sex only with men or only with women (Einhorn & Polgar, 1994). Behavioral ambiguities in identification with risk groups such as these may reduce an individual's perceived susceptibility to HIV infection, perhaps resulting in higher rates of risk behavior (Ehrhardt & Wasserheit, 1991; Stokes, McKirnan, & Burzette, 1993; Stevens, 1994).

Further compounding this risk is the possibility that heterosexually active lesbians and those bisexual women who are closely affiliated with the gay and lesbian community may be more likely than heterosexual women in general to select male sexual partners from among the population of gay men who share their social network (Cochran, Nardi, Mays, & Taylor, 1996; Padian et al., 1987; Peplau, Cochran, & Mays, 1996; Reinisch et al., 1995). For example, Einhorn and Polgar (1994) found that 13% of lesbians and 42% of bisexual women surveyed in 1989-1991 reported having sex with a gay or bisexual man at least once since 1978. Thus, although the extent of risk for HIV infection via female-to-female sexual transmission has been an issue of some controversy (Chu et al., 1992; Kennedy et

al., 1995; Marmor et al., 1986; Monzon, & Capellan, 1987; Perry, Jacobsberg, & Fogel, 1989; Raiteri, Fora, & Sinicco, 1994; Reynolds, 1994; Rich et al., 1993; Stevens, 1993), risk of HIV infection for lesbian and bisexual women from sex with men has not (Chu et al., 1992). To the extent that young women experiment with sexual activities with both men and women, they increase their risk of HIV infection as well as other STDs (Edwards & Thin, 1990; O'Hanlan, 1995).

A second issue related to STDs among the population of young women who have sex with women (WSW) is that previous studies (Edwards & Thin, 1990; Raiteri, Fora, Gioannini et al., 1994) have suggested the possibility that sex between women may increase the likelihood of transmitting nonspecific vaginal infections, trichomonas vaginalis (Sivakumar, De Silva, & Roy, 1989), herpes (O'Hanlan, 1995), and bacterial vaginosis (Berger, Kolton, Cummings, Feldman, & McCormack, in press). In contrast, other STDs, such as syphilis and gonorrhea, occur rarely, if at all, among women who only have sex with women (Edwards & Thin, 1990; Raiteri, Fora, Gioannini et al., 1994). Risk factors for those STDs thought to be readily transmitted by female-to-female sexual contact have yet to be well documented. For example, though it is well known that number of sexual partners increases risk for STDs in general (Anderson, 1991), this has yet to be empirically demonstrated among WSW.

Finally, the extent to which young lesbian and bisexual women have altered their sexual behaviors in response to the HIV epidemic is not well known, although some have argued that the focus on risk groups rather than risk behaviors has discouraged these women from perceiving themselves to be at risk (Ehrhardt & Wasserheit, 1991; Hunter & Schaefer, 1994). Like other sexually active individuals, homosexually active women have been encouraged to reduce their risk for HIV by limiting their numbers of sexual partners and by using barrier protection methods during sexual activities, primarily through the use of latex dental dams or plastic wrap to eliminate contact with vaginal secretions and blood (The National Lesbian/Bisexual HIV Prevention Network, 1995). However, there is little evidence that these women are heeding this advice. One survey (Juran, 1989) found no changes in numbers of partners, though it is possible that such changes would have only very recently occurred. Also, although rarely studied, implementation rates of barrier methods appear to be quite low (Einhorn & Polgar, 1994; Raiteria et al., 1994).

This study examined HIV-related sexual risk and risk-reduction behaviors in lesbian and bisexual women, aged 18 to 25 years. Two ethnically diverse cross-sectional samples were recruited 2 years apart at local lesbian and gay pride public events. Our interest was to document prevalence of heterosexually related HIV sexual risk taking, to examine risk factors for possible STDs, and to evaluate the prevalence of risk-reduction activities and their possible changes over time.

## METHODS

## Participants

*Sample 1.* Questionnaires were completed by 181 women aged 18 to 25 years ( $M = 21.5$ ,  $SD = 2.0$ ) attending Los Angeles gay pride festivals in June 1993. All participants considered themselves either lesbian/gay (73%), bisexual (19%), or something other than these two categories but, if heterosexual, sexually active with women in the prior 12 months (7%). The sample was ethnically diverse: 47% White, 21% Hispanic, 21% African-American, 6% Asian-American, and 5% from multiethnic backgrounds. Nearly half (49%) reported that they were currently employed full time; 24% were full time students. An additional 21% were either employed part time or attended school part time or both, and 6% were currently unemployed. Only 13% reported that they had completed a bachelor's degree, whereas 58% had completed at least some college, and 29% reported a high school education or less. Forty eight percent indicated that they were currently involved in a romantic or sexual relationship with another woman.

*Sample 2.* Identical questionnaires were completed by 271 women, between the ages of 18 and 25 years ( $M = 21.2$ ,  $SD = 2.0$ ), who attended Los Angeles gay pride festivals in June 1995. All participants indicated that they were lesbian/gay (72%), bisexual (22%), or something other than these but, if heterosexual, sexually active with women (6%). This sample, too, was ethnically diverse with 50% reporting White, 21% Hispanic, 14% Black, 7% Asian-American, and 7% multiethnic backgrounds. Approximately 38% of the women were employed full-time, 35% were full-time students, 21% were employed or going to school part-time or both, and 6% were unemployed. Fifteen percent reported completing a bachelor's degree, 60% some college, and 24% high school or less. Slightly more than half (51%) of the women were currently in a committed lesbian relationship. There were no statistically significant differences in demographic characteristics between the two samples.

## Instrument

The questionnaire included items assessing demographic characteristics and recent homosexual and heterosexual sexual histories relevant to HIV risk assessment. Questions assessing sexual experiences addressed both 1-year and 3-month prevalence of homosexual and heterosexual sexual experiences, numbers of sexual partners, use of condoms (for heterosexual sex) or latex or plastic protection (for homosexual sex), and heterosexual sexual contact with men whom they knew to

be gay. Women were also asked questions concerning their HIV testing status and 1-year prevalence of STDs, including syphilis, gonorrhea, vaginal infections, and other STDs.

## Procedure

Brief two-page anonymous questionnaires were administered in an identical fashion 2 years apart to 535 women attending the annual lesbian/gay pride festival or the African-American lesbian/gay beach party in Los Angeles. Potential respondents who appeared to be within the target age range were approached by research staff. Staff asked the potential participant if she was between the ages of 18 and 25 years and willing to complete a brief sexual behavior survey on the spot. Participation was voluntary; with subjects receiving \$2.00 for completing the questionnaire. At initial contact and recruitment, no attempt was made to screen potential participant's actual sexual orientation or sexual behavior. Questionnaires completed by women who did not fall within the 18-to 25-year-old age range ( $n = 47$ , 9% of those recruited) or who self-identified as heterosexual and did not report sex with women in the prior year ( $n = 36$ , 7%) were dropped from further consideration. These procedures were approved under the university human subjects protection committee guidelines.

## Data Analysis

For univariate analyses, data were analyzed using the Pearson chi-square test or Fisher Exact test for frequency data and Student  $t$  tests and one-way analysis of variance (ANOVA) for interval data, as appropriate. All confidence intervals (CIs) reported are 95% CI. Maximum likelihood stepwise logistic regression was used to evaluate multivariate predictors of self-reported 12-month prevalence of STDs. Model fit of the regression equations was evaluated by the goodness of fit  $\chi^2$ . All equations reported are consistent with model fit,  $p > .05$ .

## RESULTS

### Prevalence of Homosexual Sexual Behaviors

No statistically significant differences in prevalent homosexual sexual behaviors were observed between the two samples, with one exception. Women surveyed in 1995 reported different numbers of partners in the prior 12 months than women in 1993,  $\chi^2(3) = 8.85$ ,  $p < .05$ . Specifically, women in 1995 were more likely to report

that they had been monogamous during the prior 12 months (51.5%, CI = 45.5%–57.5%) than women in 1993 (43.2%, CI = 35.9%–50.5%) although in both the 1993 and 1995 samples the median number of female sexual partners in the prior 12 months was 1.0. Due to the general absence of differences in sexual behaviors or demographic characteristics between the 1993 and 1995 samples, data were combined.

Overall, 39.2% (CI = 34.6%–43.7%) of women reported more than one female sexual partner in the prior year, but only 12.0% (CI = 9.0%–15.0%) in the prior 3 months (see Table 1). For most women, oral sex was a common component of sexual behavior. Eighty-four percent (CI = 80.6%–88.2%) of women who had sex in the past 3 months reported that they had performed oral sex on a partner, and 89% (CI = 86.0%–92.5%) reported that their partner had performed oral sex on them. However, few women indicated that they ever used latex or plastic wrap as a protective barrier during oral sex. Only 21.8% (CI = 17.1%–26.5%) of women who performed oral sex on a female partner in the prior 3 months reported using barrier protection methods. Similarly, 18.4% (CI = 14.0%–22.7%) reported that a female partner in the past 3 months had used latex or plastic wrap while performing oral sex on them.

Sexual behavior patterns differed depending on women's self-reported sexual orientation (see Table 1). Women who self-identified as lesbian or gay were more likely to report greater 12-month,  $\chi^2(2) = 30.02, p < .001$ , and 3-month prevalence,  $\chi^2(2) = 21.19, p < .001$ , of any sexual activity with women, though they were no more likely than other women to report multiple female sexual partners in either time period. Lesbians who reported being sexually active with women in the prior 3 months were also more likely than other women to report practicing active,  $\chi^2(2) = 7.58, p < .05$ , but not receptive oral sex,  $\chi^2(2) = .75, p > .05$ .

Use of latex or plastic protection for oral sex by both participants,  $\chi^2(4) = 25.23, p < .001$ , and their partners,  $\chi^2(4) = 17.89, p < .001$ , also varied by sexual orientation. Bisexually identified women were most likely and those who considered themselves neither lesbian nor bisexual were least likely to report any use of protective barrier methods by themselves,  $\chi^2(2) = 6.22, p < .05$ , in the prior 3 months. A similar pattern for use by partners of protective barrier methods was observed with women who self-identified as lesbian reporting less frequent use by their partners than bisexually identified women did,  $\chi^2(2) = 12.19, p < .01$ , and the latter group reporting greater use by their partners than did women who did not self-identify with either label,  $\chi^2(2) = 6.09, p < .05$ .

### Prevalence of Heterosexual Risk Behaviors

No statistically significant differences were observed between the two samples in prevalence of heterosexual sexual behaviors. For that reason, we again combined

TABLE 1  
Prevalence of Homosexual Sexual Behaviors by Sexual Orientation

	<i>Lesbian/Gay</i>		<i>Bisexual</i>		<i>Other</i>		<i>Total Sample<sup>a</sup></i>	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No. of female sexual partners (prior 12 months)								
0	20	6.5	22	25.0	7	28.0	56	12.6
1	162	52.3	35	39.8	9	36.0	214	48.2
2 to 4	107	34.5	29	33.0	7	28.0	148	33.3
5 or more	21	6.8	2	2.3	2	8.0	26	5.9
No. of female sexual partners (prior 3 months)								
0	46	14.7	32	36.0	8	29.6	97	21.6
1	231	73.8	44	49.4	15	55.6	298	66.2
2 to 4	33	10.5	11	12.4	3	11.1	49	10.9
5 or more	3	1.0	2	2.2	1	3.7	6	1.3
Practice of cunnilingus (prior 3 months)								
No. of active oral sex partners								
0	80	25.6	45	51.2	14	51.8	152	33.8
1	202	64.7	34	37.8	12	44.4	254	56.4
2 to 4	28	9.0	9	10.0	1	3.7	41	9.1
5 or more	2	0.6	1	1.1	0	0.0	3	0.7
No. of receptive oral sex partners								
0	73	23.3	39	43.4	11	40.7	134	30.4
1	210	67.1	40	44.4	13	48.1	263	59.6
2 to 4	28	8.9	10	11.1	2	7.4	40	9.1
5 or more	2	0.6	1	1.1	1	3.7	4	0.9
Use of latex/plastic protection during oral sex								
By self <sup>b</sup>								
Never	185	79.7	29	65.9	13	100.0	233	78.2
Sometimes	40	17.2	6	13.6	0	0.0	46	15.4
Always	7	3.0	9	20.5	0	0.0	19	6.4
By partner <sup>b</sup>								
Never	195	81.9	38	74.5	16	100.0	249	81.6
Sometimes	33	13.9	4	7.8	0	0.0	37	12.1
Always	10	4.2	9	17.6	0	0.0	19	6.2

Note. Percentages based on nonmissing data.  $N = 452$ .

<sup>a</sup>Includes 21 women for whom sexual orientation data were missing. <sup>b</sup>Includes only those women who reported at least one oral sex partner.

data from the two time points. Overall, 26.0% (CI = 21.8%–30.2%) of women reported having sexual contact with men in prior year and 15.7% (CI = 12.2%–19.1%) reported sexual contact with men in the prior 3 months (see Table 2). As might be expected, women who self-identified as lesbian were significantly less likely to report sexual contact with men in the prior 3 months  $\chi^2(2) = 136.7$ ,  $p < .001$ , or year period,  $\chi^2(2) = 146.56$ ,  $p < .001$  than either bisexually identified women or those who rejected either categorization. Nevertheless, approximately

TABLE 2  
Prevalence of Heterosexual Sexual Behaviors by Sexual Orientation

	Lesbian/Gay		Bisexual		Other		Total Sample <sup>a</sup>	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Number of male sexual partners (prior 12 months)								
0	275	89.9	29	31.9	9	33.3	316	74.0
1	23	7.5	28	30.8	10	37.0	61	14.3
2 or more	8	2.6	34	37.4	8	29.6	50	11.7
Number of male sexual partners (prior 3 months)								
0	297	97.1	46	50.5	14	51.9	360	84.3
1	6	2.0	30	33.3	10	37.0	46	10.8
2 or more	3	1.0	15	16.6	3	11.1	21	4.9
3-month prevalence of heterosexual sexual behaviors								
Vaginal sex	6	2.0	43	47.2	13	48.1	62	14.5
Anal sex	1	0.3	9	9.9	1	3.7	11	2.6
Any penetrative sex	6	2.0	44	48.4	13	48.1	63	14.8
Condom use—always <sup>b</sup>	2	0.6	24	26.4	3	11.1	29	6.8
Sex with gay male partner	0	0.0	9	9.9	3	11.1	12	2.8

Note. *N* = 427.

<sup>a</sup>Includes 3 women who did not provide sexual orientation data. <sup>b</sup>Includes only those women who reported penetrative sex occurred.

10% of self-identified lesbians (CI = 6.8%–13.5%) reported sex with men in the prior year; 2.9% (CI = 1.0%–4.8%) in the previous 3 months.

Of the 67 women in both samples who reported heterosexual sexual contact in the prior 3 months, 92% reported engaging in vaginal intercourse, 16% in anal intercourse, and 94% (*n* = 63) in any penetrative sexual intercourse (vaginal or anal). Twelve of these 63 women (19%, CI = 9.4%–28.7%) reported that they had sex with a gay man in the prior 3 months. Overall, 3 of 12 women (25%) reporting penetrative heterosexual intercourse with a gay man in the prior 3 months indicated that condoms were always used, whereas 25 of 51 women (49%) who indicated having had sexual intercourse but not with a gay man reported always using condoms, Fisher's Exact *p* = .09.

No self-identified lesbian or gay woman reported sex with a gay man in the previous 3 months. Instead, all of those who did so described themselves as bisexual or something else,  $\chi^2(2) = 32.91, p < .001$ . Women reporting sex with gay men were also significantly younger ( $M = 19.2$  years,  $SD = 1.54$ ) than the rest of the sample,  $t(421) = 3.79, p < .001$ . Indeed, two thirds of these women were teenagers (as opposed to 22.8%, CI = 18.9%–26.6%, of the total sample). Reflecting this, they were also less likely than the total sample to report that they were full-time employed (8% vs. 44%),  $\chi^2(3) = 8.90, p < .05$ .



In the total sample, women who self-identified as lesbian or gay were significantly older than self-identified bisexual women but not women who did not consider themselves as something other than bisexual or lesbian,  $F(2,428) = 3.18$ ,  $p < .05$ . There were no other statistically significant demographic differences.

### Risk Factors for Self-Reported STDs

Fifty-eight percent (CI = 53.2%–62.6%) of women reported that they had an HIV antibody test at some time in the past. Only one woman (a 21-year-old, White lesbian) reported testing HIV antibody positive (prevalence = 0.5% of those tested). The median number of months since the most recent test among tested women was 5.1 months ( $M = 9.5$  months,  $SD = 13.1$ ). Reporting having had an HIV antibody testing was unrelated to self-reported sexual orientation,  $\chi^2(2) = 2.43$ ,  $p > .05$ . Instead, women who reported sex with men,  $\chi^2(1) = 4.32$ ,  $p < .05$ , or more than one female sexual partner,  $\chi^2(1) = 11.46$ ,  $p < .001$ , in the previous year were significantly more likely than those who did not to report a prior HIV Antibody test. Of the 12 women reporting penetrative sex with a gay male, 8 (66.7%) also reported having had an HIV Antibody test, a prevalence similar to those women reporting penetrative heterosexual sex but not with a gay man (60%), Fisher's Exact test  $p = .24$ . African-American women were significantly more likely to report a prior HIV antibody test (70%, CI = 59.9%–80.7%) than Hispanic (48%, CI = 37.9%–58.7%) or Asian-American (41%, CI = 23.4%–59.3%) women,  $\chi^2(3) = 11.30$ ,  $p < .01$ . Fifty nine percent (CI = 52.4%–65.7%) of White women reported a prior test.

One-year prevalence of self-reported STDs was similarly low. Only 7.2% (CI = 4.8%–9.7%) of women reported the occurrence of a possible STD in the previous year. By far the most frequent STD reported was a vaginal infection (1-year prevalence = 6.3%, CI = 4.0%–8.6%); only one case each of gonorrhea and syphilis was reported. An additional 2.1% (CI = 0.7%–3.4%) of women indicated that they had some other unspecified STD in the prior year.

Using stepwise logistic regression, we examined possible predictors of self-reported STDs in the prior year (see Table 3). We did not include as an STD the one self-reported HIV infection in this analysis because among lesbians, injection drug use plays an equally or more important role in viral transmission (Chu et al., 1992). As would be expected, heterosexual sexual activity during this time period was a risk factor for reporting an STD, whether a vaginal infection or another STD. In addition, after controlling for this effect, numbers of female sexual partners in the prior 12 months was a significant risk factor for reports of vaginal infections but not other STDs. Demographic factors including age, ethnic/racial background, and educational achievement were not predictive of self-reported STD prevalence.

TABLE 3  
 Correlates of Self-Reported Sexually Transmitted Diseases (STDs)  
 in the Previous 12 Months: Results of Stepwise Logistic  
 Regression Analyses

<i>Correlates</i>	<i>POR</i>	<i>POR</i> <i>95% CI</i>	<i>Goodness-</i> <i>of-Fit p</i>	<i>Improvement</i> $\chi^2$ <i>p Value</i>
Any STD, except HIV				
Heterosexual sexual contact	2.89	1.35-6.20	.26	.009
Number of female sexual partners	1.73	1.06-2.83	.74	.03
Vaginal infection				
Heterosexual sexual contact	2.54	1.14-5.66	.33	.03
Number of female sexual partners	1.72	1.03-2.87	.78	.04
Other <sup>a</sup>				
Heterosexual sexual contact	4.97	1.16-21.2	.28	.03

*Note.* POR = prevalence odds ratio; CI = confidence interval. Variables considered for entry included age, ethnic/racial background, level of education, sexual orientation, heterosexual sexual activity in prior year, and number of female sexual partners in prior year. POR shown are from final step.

<sup>a</sup>Includes all self-reported STDs other than HIV and vaginal infections.

## DISCUSSION

STD-related risk behaviors of young WSW have received little focus by researchers in the past (Ehrhardt & Wasserheit, 1991). Results from the current study of young women recruited from public lesbian and gay events provides some insight into their patterns of sexual behaviors. First, in their rate of sexual partner change (numbers of sexual partners per year), young lesbian women appear more similar to heterosexuals than to gay men. A national survey of young adults, unselected for sexual orientation, indicates that 34% of women aged 18 to 19, but 50% of men, report more than one opposite-sex partner in the prior year (Forrest & Singh, 1990). In the present survey, 32% of similar aged women (18- to 19-year-olds) reported more than one female sex partner in the past year. For the total sample, the median number of female sexual partners in the prior year was one. Nevertheless, 22% of 18- and 19-year-old women studied here reported more than one male sex partner in the prior year, and within this same age group, 52% had more than one sex partner regardless of gender in the past year. Thus, rates of partner change appear similar to heterosexual men when both genders of sexual partners are considered and similar to heterosexual women when only female partners are counted. In contrast, a recent survey of young gay men between the ages of 18 and 25 years found that the median number of male sexual partners in the past year was 7 (Dean & Meyer, 1995), far greater than the numbers of partners reported in the current sample of homosexually active women.

Second, although lesbians have not been considered a high-risk group for contracting HIV infection (Chu et al., 1992) and our findings provide further reassuring evidence that prevalent HIV infection as determined by self-report is not common, the behavioral profile of some women we studied does warrant concern. Like others (Einhorn & Polgar, 1994; Holland, Ramazanoglu, Scott, Sharpe, & Thomson, 1992; Hunter, Rosario, & Rotheram-Borus, 1993; Reinisch et al., 1995), we found that heterosexual sexual contact does occur among WSW. But our results further suggest that high-risk sexual experimentation, particularly with gay men, is most likely to occur among teenagers who do not yet consider themselves to be lesbians or gay women. These findings are similar to those of Hunter, Rosario, and Rotheram-Borus (1993). Hunter et al. also found that young lesbian adolescents were less knowledgeable about HIV and felt that they were immune to the disease because they were lesbians. Because women in our sample who self-identified as lesbian were significantly older than women who indicated other sexual orientations, a finding similar to that reported by Rosario, Hunter, & Gwadz (1995), it is possible that many of the women in our survey who did not consider themselves lesbian or gay might come to use such labels as they age. Our results further suggest that seeing oneself as lesbian or gay is also associated with less sexual contact with men.

Third, our findings are consistent with others (Einhorn & Polgar, 1994; Stevens, 1994) who have reported that WSW infrequently use latex or plastic wrap protection for oral sex. In the present sample, only 22% reported any use of barrier methods for oral sex in the previous 3 months. The effectiveness of such precautions has never been demonstrated empirically and the low prevalence of self-reported HIV infection (0.5%) and other STDs among these women may explain the relative infrequency of these behavioral practices. Elsewhere (Cochran & Peplau, 1991) it has been shown that heterosexual women's reports of current behavior change to reduce risk of HIV infection is positively associated with a history of having had a STD.

Finally, the findings provide further epidemiologic evidence that vaginal infections may in fact be transmitted via woman-to-woman contact (Edwards & Thin, 1990; Sivakumar et al., 1989). Previous studies of women attending STD clinics have shown both high prevalence of vaginal infections and concordance of vaginal infection prevalence across lesbian couples (Edwards & Thin, 1990). Here we demonstrated that even after statistically controlling for risk associated with heterosexual sexual exposure, reported numbers of female sexual partners was positively associated with self-reported prevalent vaginal infections in the past year.

In viewing the findings reported, several limitations to this study should be mentioned. First, the sample was recruited from public gay pride festivals that attract large numbers of young people many of whom are comfortable with and public about their sexual orientation. Women who attend these festivals differ in unknown ways from the population of young WSW possibly affecting the gener-

alizability of our findings. We know that there are young WSW who use and are addicted to drugs (Cochran, Bybee et al., 1996), as well as others who are commercial sex workers (Deren et al., 1996). These women are probably not well represented in this study. Further, young women who are very poor, runaways, or possess characteristics of innercity populations, such as those discussed in the work of Hunter et al. (1993; Hunter & Schaecher, 1994; Rotheram-Borus et al., 1989), may have been unlikely to attend these events, which were not located in the innercity. Second, the data, including reports of STDs, were collected via self-reports and may not accurately reflect the true occurrence of STD infections. Third, it is possible, though unlikely, that some women were sampled in both the 1993 and 1995 surveys. However, only 4% of women recruited in 1995 reported identical birthdays to women recruited in 1993 suggesting that if this occurred it was rare.

Nevertheless, our findings have important implications for both understanding health-related sexual behavior issues in this population and targeting HIV and STD prevention programs. Prevention programs need to recognize that self-identified lesbians may in fact have sex with men. As such, HIV prevention efforts should address the full range of sexual behaviors that may place a person at risk, regardless of risk group, so that lesbians can accurately determine their risk for HIV infection and thus change behavior as warranted. However, a very clear target for prevention activities is homosexually active teenage women who may ultimately adopt a lesbian self-identification but at present are experimenting with heterosexual behavior within a homosexual community. Such young women appear quite likely to choose male sexual partners who may be themselves at higher risk for HIV and with whom they practice high risk behaviors. Results of this study challenge us to rethink the dissemination of information and packaging of HIV education and prevention around the risk group approach, if we want to reduce exposure to sexually transmitted infectious pathogens in this population.

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## REFERENCES

- Anderson, R. (1991). The transmission dynamics of sexually transmitted diseases: The behavioral component. In J. N. Wasserheit, S. O. Aral, K. K. Holmes, & P. J. Hitchcock (Eds.), *Research issues in human behavior and sexually transmitted diseases in the AIDS era* (pp. 38-60). Washington, DC: American Society for Microbiology.
- Berger, B. J., Kolton, S., Cummings, M., Feldman, J., & McCormack, W. M. (1995). Bacterial vaginosis in lesbians: A sexually transmitted disease. *Clinical Infectious Diseases*, 21, 1402-1405.
- Chu, S. Y., Hammett, T. A., & Buehler, J. W. (1992). Update: Epidemiology of reported cases of AIDS in women who report sex only with other women, United States, 1980-1991. *AIDS*, 6, 518-519.
- Cochran, S. D., Bybee, D., Gage, S., & Mays, V. M. (1996). 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. *Women's Health: Research on Gender, Behavior, and Policy*, 2(1 & 2), 11-33.
- Cochran, S. D., Nardi, P. M., Mays, V. M., & Taylor, R. J. (1996). Close friendship networks of gay-identified African-American men and women. Manuscript submitted for publication.
- Cochran, S. D., & Peplau, L. A. (1991). Sexual risk reduction behaviors among young heterosexual adults. *Social Science and Medicine*, 33(1), 25-36.
- Dean, L., & Meyer, I. (1995). HIV prevalence and sexual behavior in a cohort of New York gay men (Aged 18-24). *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*, 8, 208-211.
- Deren, S., Goldstein, M., Williams, M., Stark, M., Estrada, A., Friedman, S. R., Young, R. M., Needle, R., Tortu, S., Saunders, L., Beardsley, M., Jose, B., & McCoy, V. (1996). Sexual orientation, HIV risk behavior, and serostatus in a multisite sample of drug-injecting and crack-using women. *Women's Health: Research on Gender, Behavior, and Policy*, 2(1 & 2), 35-47.
- Division of STD Prevention. (1995). *Sexually transmitted disease surveillance 1994*. U.S. Department of Health and Human Services, Public Health Service. Atlanta, GA: Centers for Disease Control and Prevention.
- Edwards A., & Thin, R. N. (1990). Sexually transmitted diseases in lesbians. *International Journal of STD and AIDS*, 1, 178-181.
- Ehrhardt, A. A., & Wasserheit, J. N. (1991). Age, gender, and sexual risk behaviors for sexually transmitted diseases in the United States. In J. N. Wasserheit, S. O. Aral, K. K. Holmes, & P. J. Hitchcock (Eds.), *Research issues in human behavior and sexually transmitted diseases in the AIDS era* (pp. 97-121). Washington, DC: American Society for Microbiology.
- Einhorn, L., & Polgar, M. (1994). HIV-risk behavior among lesbians and bisexual women. *AIDS Education and Prevention*, 6, 514-523.
- Forrest, J., & Singh, S. (1990). The sexual and reproductive behavior of American women, 1982-1988. *Family Planning Perspectives*, 22, 206-214.
- Hunter, J., Rosario, M., & Rotheram-Borus, M. J. (1993, June). *Sexual and substance abuse acts that place adolescent lesbians at risk for HIV*. Poster presented at the ninth International Conference of AIDS/Fourth STD World Congress, Berlin, Germany.
- Hunter, J., & Schaecher, R. (1994). AIDS prevention for lesbian, gay, and bisexual adolescents. *Families in Society: The Journal of Contemporary Human Services*, 75, 346-354.
- Holland, J., Ramazanoglu, C., Scott, S., Sharpe, S., & Thomson, R. (1992). Risk, power, and the possibility of pleasure: Young women and safer sex. *AIDS Care*, 4(3), 273-283.
- Juran, S. (1989). Sexual behavior changes as a result of a concern about AIDS: Gays, straights, females, and males. *Journal of Psychology and Human Sexuality*, 2, 61-77.

- Kennedy, M., Scarlett, M. I., Duerr, A. C., & Chu, S. Y. (1995). Assessing HIV risk among women who have sex with women: Scientific and communication issues. *Journal of the American Medical Women's Association*, 50, 103-107.
- Lemp, G. F., Jones, M., Kellogg, T. A., Nieri, G. N., Anderson, L., Withum, D., & Katz, M. (1995). HIV seroprevalence and risk behaviors among lesbians and bisexual women. *American Journal of Public Health*, 85, 1549-1552.
- Marmor, M., Weiss, L. R., Lyden, M., Weiss, S. H., Saxinger, W. C., Spira, T., & Feorino, P. M. (1986). Possible female-to-female transmission of human immunodeficiency virus. *Annals of Internal Medicine*, 105, 969.
- Monzon, O. T., & Capellan, J. M. B. (1987). Female-to-female transmission of HIV. *Lancet*, 2(8549), 40-41.
- The National Lesbian/Bisexual HIV Prevention Network. (1995). *HIV prevention manual*. San Francisco, CA: Lyon-Martin Women's Health Services.
- O'Hanlan, K. A. (1995). Lesbian health and homophobia: Perspectives for the treating obstetrician/gynecologist. *Current Problems in Obstetrics, Gynecology, and Fertility*, 18(4), 94-132.
- Padian, N., Marquis, L., Francis, D. P., Anderson, R. E., Rutherford, G. W., O'Malley, P. M., & Winkelstein, W. (1987). Male-to-female transmission of human immunodeficiency virus. *Journal of the American Medical Association*, 258, 788-790.
- Peplau, L. A., Cochran, S. D., & Mays, V. M. (1996). A national survey of the intimate relationships of African-American lesbians and gay men: A look at commitment, satisfaction, sexual behavior, and HIV disease. In B. Greene & G. Herek (Eds.), *Psychological perspectives on lesbian and gay issues: Ethnic and cultural diversity among lesbians and gay men*. Newbury Park, CA: Sage.
- Perry, S., Jacobsberg, L., & Fogel, K. (1989). Oro-genital transmission of human immunodeficiency virus. *Annals of Internal Medicine*, 111, 951-952.
- Raiteri, R., Fora, R., Giannini, P., Russo, R., Lucchini, A., Terzi, M. G., Giacobbi, D., & Sinicco, A. (1994). Seroprevalence, risk factors, and attitude to HIV-1 in a representative sample of lesbians in Turin. *Genitourinary Medicine*, 70, 200-205.
- Raiteri, R., Fora, R., & Sinicco, A. (1994). No HIV-1 transmission through lesbian sex. *The Lancet*, 344(8917), 270.
- Reinisch, J. M., Sanders, S. A., & Ziemba-Davis, M. (1995). Self-labeled sexual orientation and sexual behavior: Considerations for STD-related biomedical research and education. In M. Stein & A. Baum (Eds.), *Chronic diseases* (pp. 241-257). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Reynolds, G. (1994). HIV and lesbian sex. *Lancet*, 344(8916), 189-190.
- Rich, J. D., Buck, A., Tuomala, R. E., & Kazanjian, P. H. (1993). Transmission of human immunodeficiency virus infection presumed to have occurred via female homosexual contact. *Clinical Infectious Diseases*, 17, 1003-1005.
- Rosario, M., Hunter, J., & Gwadz, M. (1995, April). *The coming-out process among gay/lesbian and bisexual youths*. Presented at the meetings of the Society for Research in Child Development, Indianapolis, IN.
- Rotheram-Borus, M. J., Selfridge, C., Koopman, C., Haignere, C., Meyer-Bahlburg, H., & Ehrhardt, A. A. (1989). *The relationship of knowledge and attitudes towards AIDS to safer sex practices among runaway and gay adolescents*. Paper presented at the fifth International Conference on AIDS, Montreal, Canada.
- Seidman, S. N., & Reider, R. O. (1994). A review of sexual behavior in the United States. *American Journal of Psychiatry*, 151(3), 330-341.
- Sivakumar, K., De Silva, A. H., & Roy, R. B. (1989). Trichomonas vaginalis infection in a lesbian. *Genitourinary Medicine*, 65, 399-400.
- Stevens, P. E. (1993). Lesbians and HIV: Clinical, research and policy issues. *American Journal of Orthopsychiatry*, 63(2), 289-294.

- Stevens, P. E. (1994). HIV prevention education for lesbians and bisexual women: A cultural analysis of a community intervention. *Social Science and Medicine*, *39*, 1565–1578.
- Stokes, J. P., McKiman, D. J., & Burzette, R. G. (1993). Sexual behavior, condom use, disclosure of sexuality, and stability of sexual orientation in bisexual men. *The Journal of Sex Research*, *30*, 203–213.