

HIV Seroprevalence and Risk Behaviors among Lesbians and Bisexual Women in San Francisco and Berkeley, California

ABSTRACT

Few data are available on human immunodeficiency virus (HIV) infection and risk behaviors among lesbians and bisexual women. A total of 498 lesbians and bisexual women was sampled from public venues in San Francisco and Berkeley, Calif, during 1993. The overall HIV seroprevalence was 1.2%. Ten percent of participants reported injecting drugs since 1978. Forty percent of the participants reported unprotected vaginal or anal sex with men during the past 3 years, including unprotected sex with gay and bisexual men and male injection drug users. The high rates of injection drug use and unsafe sexual behaviors suggest that lesbians and bisexual women frequenting public venues in San Francisco and Berkeley are at risk for HIV infection. (*Am J Public Health.* 1995;85:1549-1552)

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Introduction

Previous studies have found that the occurrence of woman-to-woman transmission of human immunodeficiency virus (HIV) infection is rare.¹⁻⁶ Several studies have also found that, as a result, many lesbians and bisexual women perceive themselves to be at low risk.⁷⁻¹¹ Yet, some studies have noted that women who have sex with women are more likely than heterosexual women to report injection drug use, needle sharing, or unprotected anal sex with men as well,^{7,8} behaviors that put them at substantial risk for HIV infection. However, few studies have examined the prevalence of HIV infection in this population,^{5,6,12} and those that have were limited to women recruited either from clinic-based settings or through advertisement.

To describe the prevalence of HIV infection and risk behaviors among lesbians and bisexual women in an HIV epicenter, we surveyed women at community-based settings in San Francisco and Berkeley, Calif.

Methods

A total of 550 women were surveyed from 24 venues in San Francisco and Berkeley between January and August 1993. Survey locations included street corners or sidewalks, dance clubs, bars, cafes, and community-organized social events that were attended by lesbians and bisexual women or by women who had sex with women but who did not identify themselves as lesbian or bisexual.

The sampling scheme used a form of targeted sampling.^{13,14} First, 35 potential sites were identified through interviews with 218 knowledgeable community informants and through two focus groups conducted with lesbians and bisexual women. These venues were visited an average of three times each to determine the number of women who frequented

them and the average number of eligible persons per sampling period. In addition, brief street interviews were conducted with 221 women to estimate the extent of repeat foot traffic and to adjust the estimated number of eligible persons. Only those venues ($n = 24$) that yielded at least two or more eligible persons per hour during high-volume hours were selected. Venue-specific sample sizes were determined by dividing the number of venue-specific eligible women by the sum of all eligible women enumerated across all venues, and multiplying this proportion by the overall target sample size of 550.

During field visits, women were systematically approached as they walked down a preselected stretch of sidewalk, entered a venue, or waited in line. Those approached were asked their county of residence and their month and year of birth, but not their self-identified sexual orientation. Residents of the nine-county San Francisco Bay Area who were 17 years of age or older were eligible for inclusion.

Informed consent, a face-to-face interview using a standardized questionnaire, pretest counseling, blood draw by venipuncture, and prevention counseling took place in a specially equipped van parked near the sampling venue. The 167-item questionnaire included demographics; medical and testing history; and

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TABLE 1—Seroprevalence of HIV among Lesbians and Bisexual Women in San Francisco/Berkeley, 1993, by Participant Characteristics

| | No. in Study | % HIV Positive | OR | 95% CI |
|--|--------------|----------------|------|------------|
| Age, y | | | | |
| 17–19 | 19 | 0.0 | 0.0 | ... |
| 20–29 | 297 | 0.3 | 1.0 | Reference |
| 30–39 | 149 | 2.7 | 8.2 | 0.9, 73.7 |
| ≥ 40 | 33 | 3.0 | 9.2 | 0.6, 151.5 |
| Race/ethnicity | | | | |
| White | 268 | 0.7 | 1.0 | Reference |
| African American | 83 | 3.6 | 5.0 | 0.8, 30.4 |
| Latina | 73 | 1.4 | 1.8 | 0.2, 20.7 |
| Asian/Pacific Islander | 62 | 0.0 | 0.0 | ... |
| Native American | 9 | 0.0 | 0.0 | ... |
| Sexual orientation | | | | |
| Lesbian | 339 | 0.9 | 1.0 | Reference |
| Bisexual | 108 | 2.8 | 3.2 | 0.6, 16.1 |
| Other ^a | 51 | 0.0 | 0.0 | ... |
| Gender of sex partners since 1978 | | | | |
| Men and women | 378 | 1.6 | 1.0 | Reference |
| Women only | 90 | 0.0 | 0.0 | ... |
| Men only | 27 | 0.0 | 0.0 | ... |
| History of injection drug use since 1978 | | | | |
| No | 445 | 0.4 | 1.0 | Reference |
| Yes | 52 | 7.7 | 18.5 | 3.3, 103.6 |
| Unprotected anal or vaginal sex with gay/bisexual men since 1978 | | | | |
| No | 398 | 0.5 | 1.0 | Reference |
| Yes | 100 | 4.0 | 8.2 | 1.5, 45.7 |
| Unprotected anal or vaginal sex with male injection drug users since 1978 | | | | |
| No | 438 | 0.7 | 1.0 | Reference |
| Yes | 60 | 5.0 | 7.6 | 1.5, 38.7 |
| Lifetime history of sexually transmitted diseases | | | | |
| No | 388 | 0.8 | 1.0 | Reference |
| Yes | 110 | 2.7 | 3.6 | 0.7, 18.1 |

Note. HIV = human immunodeficiency virus; OR = odds ratio; CI = confidence interval.

^aIncludes women who had a history of sex with women but who were heterosexually identified or were undecided regarding their sexual orientation.

frequency of injection drug use, sexual behaviors, and condom/latex use with male and female partners since 1978 and in the previous 3 years. Each participant received a \$50 stipend. Results and posttest counseling were subsequently provided anonymously.

HIV-1 antibody testing was performed by enzyme immunoassay, with confirmation of positive test results by indirect immunofluorescent assay and Western blot. Tests for hepatitis B (hepatitis B surface antigens and core antibody) and syphilis infection (venereal disease research laboratory test and microhemagglutination assay for *Treponema pallidum*) were also performed.

The exact binomial method was used to calculate 95% confidence intervals

(CIs) for estimates of the prevalence of HIV infection and risk behaviors. Chi-square tests were used to compare proportions. Multivariable logistic regression was used to identify predictors of risk behaviors, but models to examine predictors of HIV infection were not constructed because of the small number of HIV seropositive participants.

Results

We approached 921 women and determined eligibility, by county of residence, for 909 (99%). The remainder refused to provide their birthdate and county of residence. Of the 909 women, 798 (88%) were eligible for inclusion; of those eligible, 550 (69%) agreed to participate.

Participants and nonparticipants did not differ significantly with respect to age ($P = .20$) or race/ethnicity ($P = .10$). This analysis was limited to the 498 women (91%) who either reported one or more sexual contacts with women since 1978 ($n = 468$) or self-reported a lesbian or bisexual orientation without any history of sex with women ($n = 30$). Heterosexual women ($n = 45$) and those without sufficient blood specimens ($n = 7$) were excluded.

Overall, six participants were found to be infected with HIV, yielding a prevalence of HIV infection of 1.2% (95% CI = 0.4, 2.6%). The seroprevalence of markers for hepatitis B was 5.4% (95% CI = 3.6, 7.8%) and for syphilis, 0.4% (95% CI = 0.04, 1.4%). HIV seroprevalence was significantly higher among those reporting a history of injecting drug use ($P < .001$), or a history of unprotected anal or vaginal sex either with gay/bisexual men ($P < .01$) or with male injection drug users ($P < .01$) (Table 1). Unprotected sex was defined as sex without condoms or latex barriers such as dental dams or gloves.

Four of the six HIV-infected participants reported both injection drug use and anal or vaginal sex with gay/bisexual men or male injection drug users since 1978. The other two HIV-infected women reported no history of injection drug use, but did report a history of anal or vaginal sex with men of unknown risk status since 1978. None of the HIV-infected women reported having sex with women only since 1978.

Four percent of the women ($n = 19$) reported injecting drugs in the previous 3 years. The participants' age, race/ethnicity, and sexual orientation were not significant predictors of injection drug use in a logistic regression (Table 2). Among those women who reported a history of injection drug use since 1978 ($n = 52$; 10.4%), 71% reported a history of sharing needles and 31% reported sharing needles with gay or bisexual men.

Among those participants who engaged in sex with other women in the previous 3 years, 92% reported unprotected oral sex while a smaller proportion reported vaginal fisting (25%) or sharing dildos (29%) without using latex barriers. Fifteen percent reported participating in piercing, cutting, or whipping to the point of bleeding with female partners since 1978. Among the women who reported a history of sex with men in the past 3 years ($n = 405$), 40% reported unprotected vagi-

TABLE 2—Prevalence of Risk Behaviors in the Preceding 3 Years among Lesbians and Bisexual Women in San Francisco/Berkeley, 1993, by Participant Characteristics

| | Injection Drug Use ^a (n = 498) | | | | Unsafe Sex with Men ^b (n = 405) | | | |
|---------------------------|---|-----|-------------|-----------|--|-----|-------------|-----------|
| | Yes | No | Adjusted OR | 95% CI | Yes | No | Adjusted OR | 95% CI |
| Age, y | | | | | | | | |
| 17–29 | 15 | 301 | 1.0 | Reference | 122 | 144 | 1.0 | Reference |
| ≥30 | 4 | 178 | 0.5 | 0.2, 1.5 | 39 | 100 | 0.5 | 0.3, 0.8 |
| Race/ethnicity | | | | | | | | |
| White | 13 | 255 | 1.0 | Reference | 90 | 133 | 1.0 | Reference |
| African American | 1 | 82 | 0.2 | 0.03, 2.0 | 28 | 43 | 0.9 | 0.4, 1.7 |
| Latina | 3 | 70 | 0.9 | 0.2, 3.3 | 19 | 32 | 1.1 | 0.5, 2.3 |
| Other | 2 | 72 | 0.6 | 0.1, 2.6 | 24 | 36 | 1.1 | 0.6, 2.2 |
| Sexual orientation | | | | | | | | |
| Lesbian | 11 | 328 | 1.0 | Reference | 50 | 203 | 1.0 | Reference |
| Bisexual | 7 | 101 | 1.8 | 0.7, 4.9 | 76 | 31 | 9.5 | 5.6, 16.1 |
| Other ^c | 1 | 50 | 0.6 | 0.1, 5.1 | 35 | 10 | 15.0 | 6.9, 32.7 |

Note. Adjusted OR = adjusted odds ratio from logistic regression model; CI = confidence interval for adjusted odds ratio.

^aThe variables of age, race/ethnicity, and sexual orientation were rejected as predictors of injection drug use in a logistic regression model because they exceeded the *P*-value criterion for entry or removal (in both cases, *P* = .1).

^bHistory of unprotected vaginal or anal sex with men among the 405 women reporting sex with men. The variable of race/ethnicity was rejected as a predictor of unsafe sex in a logistic regression model because it exceeded the *P*-value criterion for entry or removal (in both cases, *P* = .1).

^cIncludes women who had a history of sex with women but who were heterosexually identified or were undecided regarding their sexual orientation.

nal (39%) or anal (11%) sex while a smaller proportion reported engaging in such behavior with gay and bisexual men (10%) and/or with male injection drug users (6%). Six percent reported participating in piercing, cutting, or whipping to the point of bleeding with male partners since 1978. In a logistic regression model, women who were younger or who self-identified as bisexual or heterosexual had a higher predicted risk for unprotected vaginal or anal sex with men than women who were older or who self-identified as lesbian (Table 2).

Discussion

We found that 1.2% of lesbians and bisexual women who frequented public venues in San Francisco and Berkeley in 1993 were infected with HIV. This prevalence is higher than that reported for childbearing women (0.2%)¹⁵ or for women sampled through population-based household surveys (0.4%),¹⁶ but it is slightly lower than that reported for women attending a sexually transmitted disease clinic in San Francisco (2.0%).¹⁷ We found no evidence of woman-to-woman transmission among the six HIV-infected women in the survey. However, the high rates of injection drug use and unsafe sexual behaviors suggest that lesbians and bisexual women are nevertheless at risk for HIV infection.

Our results are consistent with those from previous surveys of lesbians and

bisexual women, which revealed high rates of injection drug use, needle sharing, and unprotected sex with men.^{7–11} In addition, our estimate of HIV prevalence is similar, though slightly lower, than that observed by one large clinic-based study (2.5%)⁵ and one small convenience survey (6.1%).¹²

Our study has several limitations that may affect its generalizability. First, because we limited the survey to women who attended 1 of 24 venues in San Francisco and Berkeley, the results may not generalize to those who do not frequent these settings. Thus, our sample may not be representative of all lesbians and bisexual women, particularly given the relatively high prevalence of sadomasochistic practices such as piercing, cutting, or whipping. However, results from our focus groups and enumerations indicate that many lesbians and bisexual women do frequent these venues, so these venues represent important settings for targeting prevention interventions. In addition, more traditional population-based sampling strategies such as household or telephone surveys would probably underrepresent persons of color, injection drug users, and homeless lesbians and bisexual women—populations that are often hidden and difficult to reach through such methods.^{13,14} A second limitation of our study is that only 69% of the eligible women agreed to participate. Although the participants and nonparticipants did not differ by age or race/ethnicity, they

may differ with respect to other factors that cannot be measured, including frequency of engaging in high-risk practices.

Findings from our study as well as others^{1–6} suggest that woman-to-woman sexual transmission of HIV is probably rare. This relative rarity may lead many lesbians and bisexual women to falsely perceive themselves as being at low or no risk, regardless of their sexual or needle-using behaviors.^{7–11} In addition, service providers may have failed to address risk behaviors in this population because of a perceived absence of risk.^{18,19} However, although evidence of woman-to-woman transmission is lacking, the high rates of injection drug use and unsafe sexual behaviors with male partners suggest that lesbians and bisexual women who frequent public venues in San Francisco and Berkeley are at risk for HIV infection. Thus, rather than characterize all lesbians and bisexual women as being at low risk for HIV infection, prevention programs that target these women should place more emphasis on individual risk behaviors and focus on reducing injection drug use and unsafe sexual behaviors with men. □

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ABSTRACT

This study measured the migration of persons with the acquired immunodeficiency virus (AIDS) between diagnosis and death using AIDS case and death reports from 12 states for 1985 to 1992. Of 49 805 persons with AIDS, 10.6% changed their place of residence, and half of these individuals who moved changed their state of residence. Migration had relatively little impact on the numbers of persons with AIDS in the largest metropolitan areas, which accounted for approximately 90% of AIDS diagnoses. Although only 3% of deaths occurred in residents of nonmetropolitan areas, the net effect of migration was a 24% increase in the number of persons with AIDS residing in such areas. (*Am J Public Health.* 1995;85:1552-1555)

The Migration of Persons with AIDS: Data from 12 States, 1985 to 1992

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Introduction

Information on persons with the acquired immunodeficiency syndrome (AIDS) is widely used in allocating human immunodeficiency virus (HIV) prevention and care resources. For example, federal HIV care funds allocated under the Ryan White Comprehensive AIDS Resources Emergency Act of 1990 are awarded to metropolitan areas and states using formulas based on AIDS reports.¹ In addition, AIDS reports have been used extensively within states to target HIV prevention resources. Because AIDS reporting is based on the place of residence at AIDS diagnosis and because persons with AIDS may move, AIDS reports may not accurately reflect HIV prevention or care needs in some areas. We used information from AIDS case reports and death certificates to examine the extent of migration between AIDS diagnosis and death.

Methods

We studied persons with AIDS who died between 1985 and 1992 using data from the AIDS Mortality Project. As has been described previously, participating health departments obtained death certificates for persons reported with AIDS through local vital registries and the National Death Index.^{2,3} We defined migration or "a move" as a change in the place of residence between the time of AIDS diagnosis (as listed on AIDS case

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