AIDS in Bisexual Men in the United States: Epidemiology and Transmission to Women

Susan Y. Chu, PhD, Thomas A. Peterman, MD, Lynda S. Doll, PhD, James W. Buehler, MD, and James W. Curran, MD

ABSTRACT

Background. Homosexual and bisexual men with acquired immunodeficiency syndrome (AIDS) differ, and bisexual men play an important role in the sexual transmission of human immunodeficiency virus (HIV) to women.

Methods. To describe AIDS in these groups, we examined AIDS cases reported nationally through June 1990.

Results. Among 65 389 men who reported having had sex with men since 1977, 26% were bisexual. More Black (41%) and Hispanic men (31%) than White men (21%) reported bisexual behavior. Bisexual men were twice as likely to report intravenous drug use (20%) as were homosexual men (9%), regardless of race or ethnicity. Among 3555 women with heterosexually acquired AIDS, 11% reported sexual contact with a bisexual man and no other risk factor, although in some states approximately half reported such contact. In 1989, the AIDS rate due to sex with a bisexual man was three and five times higher among Hispanic and Black women, respectively, than among White women.

Conclusions. Differences between bisexual and homosexual men with AIDS and the relative importance of AIDS in women due to sexual contact with bisexual men should be considered in the development of HIV prevention programs. (*Am J Public Health.* 1992;82:220–224)

Introduction

Most reports on human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) consider bisexual and homosexual men as a single group. However, this categorization may not always be appropriate. Bisexual men may differ from homosexual men in several behavioral and epidemiologic aspects of HIV infection[1,2] and these differences have important public health implications. Interventions designed to prevent HIV transmission among homosexual men may not reach or be appropriate among bisexual men. For example, bisexual men may be less likely to identify with gay communities or to view themselves as at risk for HIV infection.[3,4] In addition, bisexual men may transmit HIV to their female partners.

In this study, we analyzed national AIDS surveillance data to compare bisexual men (men who reported sexual contact with both men and women) and homosexual men (men who reported sexual contact with men and not with women) with AIDS and to assess the relative importance of bisexual men in the heterosexual transmission of HIV to women.

Methods

We used national surveillance data for cases of AIDS in persons over 13 years of age who were reported to the Centers for Disease Control (CDC) from June 1981 through June 1990.

The sexual behavior of men was determined by using responses to the following two questions on the AIDS case report form:

> "After 1977 and preceding the diagnosis of AIDS, did this patient have sexual relations with a male partner?"
> "After 1977 and preceding the diagnosis of AIDS, did this patient have sexual relations with a female partner?"

Men were classified as homosexual if they were reported as having had sex with men and not with women, and were classified as bisexual if they were reported as having had sex with both men and women. Men who were reported as having had sex with men but for whom information on sex with women was missing were excluded.

Data on AIDS indicator diseases were also obtained from AIDS case reports; more than one condition can be specified. The surveillance definition for AIDS was revised in September 1987 to include additional indicator diseases and to accept the presumptive diagnoses of some other indicator diseases.[5] Persons meeting only the new criteria were more likely to be Black, Hispanic, or intravenous (IV) drug users[6]; therefore, we repeated our analyses, including only patients who met the pre-1987 definition. Because results were similar, we report findings based on all reported cases meeting the current case definition. Analyses of indicator conditions added with the revised case definition (e.g., wasting syndrome) were restricted to persons reported after September 1987.

A woman was classified as having AIDS due to heterosexual transmission if

Susan Y. Chu, Lynda S. Doll, James W. Buehler, and James W. Curran are with the Division of HIV/AIDS, National Center for Infectious Diseases, and Thomas A. Peterman is with the Division of Sexually Transmitted Diseases, National Center for Prevention Services, all at the Centers for Disease Control, Atlanta, Ga.

Requests for reprints should be sent to Susan Y. Chu, PhD, Surveillance Branch, Division of HIV/AIDS, Center for Infectious Diseases, Centers for Disease Control, Mailstop E-47, 1600 Clifton Rd NE, Atlanta, GA 30333.

This paper was submitted to the journal May 22, 1991, and accepted with revisions August 22, 1991.

Editor's Note. See related editorial by Lifson on page 166 of this issue.

she had no history of blood transfusion or IV drug use and reported having had sexual contact with a person who had AIDS or HIV infection, or with a person who had any of the following risks since 1977: IV drug use, male-to-male sexual contact, or receipt of blood or a blood product.[7] Because we were primarily interested in HIV transmission in the United States, we excluded women born in countries where heterosexual contact is the primary means of HIV transmission (i.e., African and Caribbean countries). To assess the relative importance of bisexual men in the heterosexual transmission of HIV among women, we compared the number of cases of AIDS in women attributed to sexual contact with a bisexual man with the number of cases attributed to sexual contact with a male IV drug user. We used sex- and race-specific mid-year (July 1) population estimates from public-use computer tapes prepared from Bureau of Census data to calculate annual AIDS rates.[8] Population estimates for persons of Hispanic origin were extrapolated from US Bureau of the Census reports.[9,10]

Results

Epidemiologic Differences Between Bisexual and Homosexual Men with AIDS

Complete responses to the two sexual history questions were available for 65 389 men who reported having had sex with men since 1977; of these, 16 793 (26%) also reported having had sex with women. The proportion of bisexual men has increased slightly over time, from 23% in 1983 to 26% in 1989.

For an additional 26 092 men who reported having had sex with men, information regarding sexual contact with women was missing. The distribution of characteristics for these men was intermediate to those of men classified as homosexual or bisexual, suggesting that some were bisexual and some were homosexual.

Bisexual and homosexual men differed by race/ethnicity. Among men who reported sex with men (homosexual and bisexual combined), bisexuality was reported by more Black (41%) and Hispanic (31%) men than White men (21%) (Table 1). These differences were fairly consistent over time and in different states.

The proportion of men who were bisexual increased with age after age 30 to 39 years (Figure 1). The pattern with age was consistent among racial/ethnic groups except for young Black men (13–19 years of age). These differences by age were not affected by IV drug use or year of diagnosis.

TABLE 1—Bisexual and Homosexual Men Reported with AIDS, United States, through June 1990

Race/ethnicity	Bisexual	Homosexual	% Bisexual[a]
White	9555	36 260	21
Black	4842	6851	41
Hispanic	2217	5049	31
Asian/Pacific Islander	152	367	29
American Indian/Alaskan Native	27	69	28
Total	16 793	48 596	26

Note. Men were classified as bisexual if they reported having had sex with both men and women since 1977, and were classified as homosexual if they reported having had sex with men and not with women.
[a]% Bisexual = [(number of bisexual men with AIDS)/(number of bisexual men with AIDS + number of homosexual men with AIDS)] × 100.

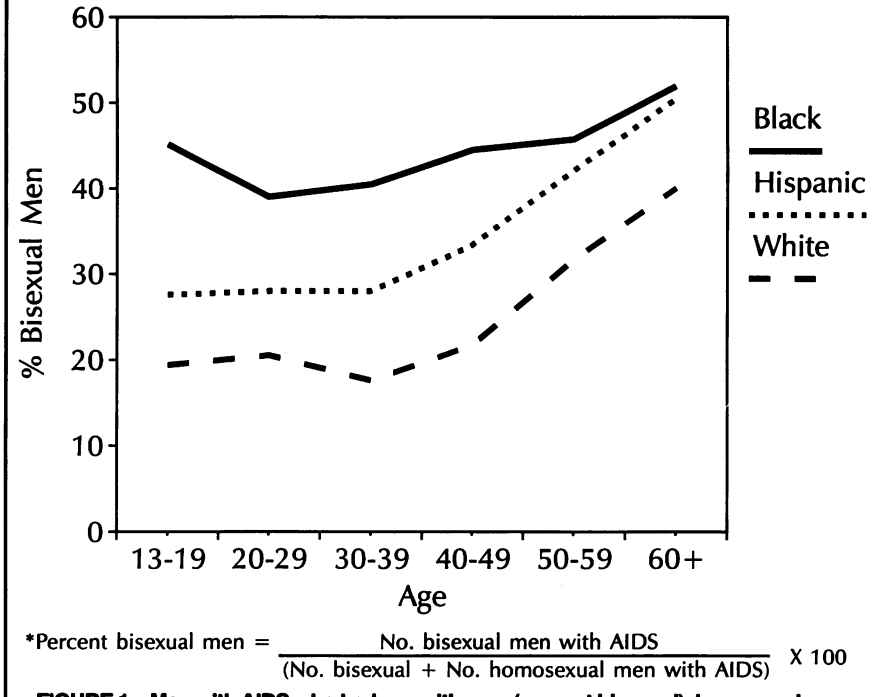


FIGURE 1—Men with AIDS who had sex with men (percent bisexual), by age and race, United States, through June 1990.

Bisexual men with AIDS were twice as likely as homosexual men to report IV drug use (Table 2). The increased use of IV drugs among bisexual men was observed in each racial/ethnic group, with the most pronounced difference among Hispanic men. This difference in IV drug use between bisexual and homosexual men with AIDS was also consistent by region (IV drug use in bisexual men/IV drug use in homosexual men: Northeast, 2.4; Midwest, 2.4; South, 2.2; West, 1.9) and by year of diagnosis.

The opportunistic diseases reported for bisexual and homosexual men with AIDS were similar except for Kaposi's sarcoma and wasting syndrome. Kaposi's sarcoma (including presumptive and definitive diagnoses) was about 1.5 times more common among homosexual than among bisexual men with AIDS (Table 3). This difference persisted across different racial/ethnic groups, although the difference was smaller among Black men, and also was consistent across age groups. Although the frequency of Kaposi's sarcoma in all men with AIDS has declined over time, the difference between homosexual and bisexual men in frequency of Kaposi's sarcoma persisted by diagnosis year. For example, in 1984, 38% of homosexual men and 27% of bisexual men were reported with Kaposi's sarcoma; in 1989, 17% of

TABLE 2—History of Intravenous Drug Use in Bisexual and Homosexual Men Reported with AIDS, United States, through June 1990

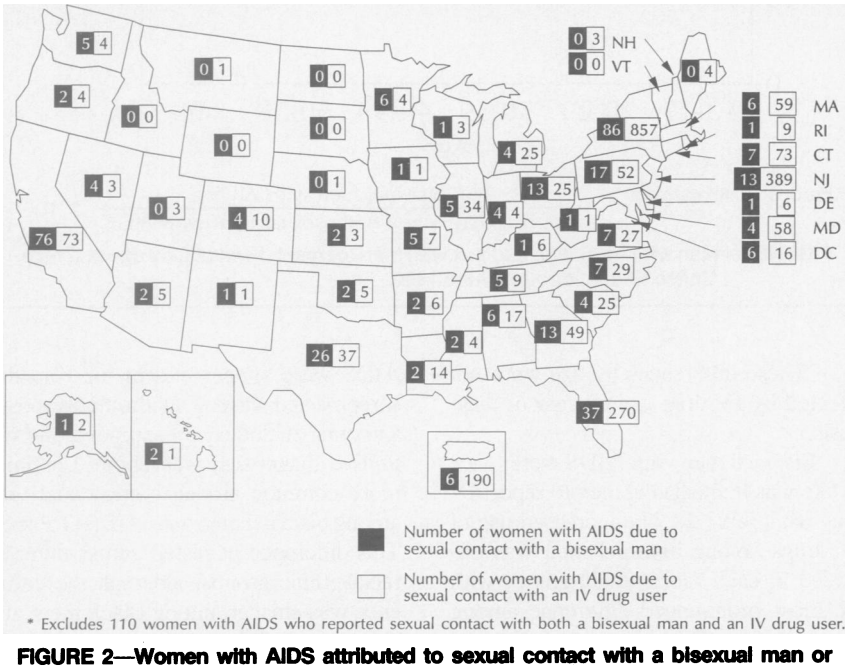
	Percentage with History of Intravenous Drug Use[a]			
	White (n = 44 034)	Black (n = 10 521)	Hispanic (n = 6614)	Total[b] (n = 61 784)
Bisexual	16	23	27	20
Homosexual	8	14	11	9

[a]Excludes 1781 White, 1172 Black, and 652 Hispanic men with unknown histories of intravenous drug use.
[b]Includes 519 Asian/Pacific Islanders and 96 Native Americans.

TABLE 3—Kaposi's Sarcoma and HIV Wasting Syndrome in Bisexual and Homosexual Men Reported with AIDS, United States, through June 1990

	White	Black	Hispanic	Total
	Percentage with Kaposi's Sarcoma			
	(n = 45 815)	(n = 11 693)	(n = 7266)	(n = 65 389)
Bisexual	17	8	15	14
Homosexual	23	11	22	21
	Percentage with HIV Wasting Syndrome			
	(n = 35 077)	(n = 9764)	(n = 5754)	(n = 51 095)[b]
Bisexual	19	20	20	19
Homosexual	14	16	11	14

[a]Includes 519 Asian/Pacific Islanders and 96 Native Americans
[b]Includes persons reported after September 1987 only; includes 410 Asian/Pacific Islanders and 90 Native Americans.



* Excludes 110 women with AIDS who reported sexual contact with both a bisexual man and an IV drug user.

FIGURE 2—Women with AIDS attributed to sexual contact with a bisexual man or sexual contact with IV drug user, United States, through June 1990.

homosexual men and 10% of bisexual men were reported with Kaposi's sarcoma. Findings were similar when IV drug users were excluded from the analyses.

Wasting syndrome was more common among bisexual men with AIDS than among homosexual men with AIDS (Table 3). This difference was consistent regardless of race or IV drug use, except for Black IV drug users, among whom no difference in the frequency of wasting syndrome was seen. This difference in wasting also was consistent by diagnosis year and by region of the United States, although the difference was greater in the US Territories (wasting diagnosis in bisexual men, 46%; in homosexual men, 36% and smaller in the West (wasting diagnosis in bisexual men, 16%; in homosexual men, 14%).

Women with AIDS Reporting Contact with a Bisexual Man

Among 3555 women with AIDS who acquired HIV infection through heterosexual contact (excluding women born in African or Caribbean countries), 11% (n = 405) reported sexual contact with a bisexual man and no other risk factor for AIDS. Another 114 women with AIDS reported sexual contact with a bisexual man and another specific heterosexual contact (an IV drug user, n = 110; a transfusion recipient or person with hemophilia, n = 4).

In 1989, the rate for AIDS due to sex with a bisexual man (and no other partner at risk) was three and five times higher among Hispanic (1.8 per 1 000 000) and Black (2.8 per 1 000 000) women, respectively, than among White women (0.6 per 1 000 000), and was seven times lower overall than the rate for AIDS due to sex with an IV drug user. However, the relative importance of AIDS attributed to sexual contact with bisexual men varied widely by state (Figure 2). In states with a relatively low HIV seroprevalence in IV drug users (e.g., California), the number of cases in women associated with sex with a bisexual man was comparable to the number associated with sex with an IV drug user. In states with high HIV seroprevalence in IV drug users (e.g., New Jersey and New York), AIDS due to sexual contact with an IV drug user accounted for most heterosexually acquired AIDS in women, regardless of race.

Discussion

Our estimate that 14% of all men with AIDS are bisexual is a minimum estimate; if the frequency of bisexuality was the same in the group with missing data as in the group with complete information, bisexual men with AIDS would represent 19% of all men with AIDS. The percentage of men who were bisexual has increased slightly over time. This increase

may be influenced by the sexual history questions, which asked only about sexual contact with men or women since 1977. Reports for more recent cases would cover a longer time period and these questions could not distinguish between early and more recent sexual behavior.

Among men with AIDS who reported having had sex with men, Blacks reported bisexuality more frequently than did Whites or Hispanics. Similar findings have been reported elsewhere. In a study of sexually transmitted disease clinic patients in Ohio, among 1107 men who reported having had sex with other men, 47% of the Black men and 27% of the White men classified themselves as bisexual.[11] In a study conducted at 20 large blood centers, 209 HIV-infected prospective male blood donors reported having had sex with men; 48% of Blacks, 36% of Hispanics, and 33% of Whites had had sex with a woman in the previous year.[3] Some have suggested that the adoption of a bisexual life-style among Black men may be related to the difficulty of being homosexual in the Black community.[1] However, these data do not enable us to distinguish between a difference in reporting and a true difference in behavior by race/ethnicity.

The Hispanic population in the United States is diverse in country of origin and degree of acculturation. Unless bisexual Hispanic men are highly acculturated, their behavior patterns may be more similar to behavioral patterns of their country of origin.[1] From studies of bisexual behavior in Mexico, it was estimated that as many as 30% of Mexican men between the ages of 15 and 25 may engage in sex with both men and women.[12] However, men who practiced the active, insertive role in male-to-male sex and who also had sex with women did not view themselves as homosexual or bisexual; thus they were a potentially difficult group to reach.[12,13] Because of the diversity of the Hispanic population, generalizations about AIDS-related behaviors must be made cautiously.[1]

Older men with AIDS who reported having had sex with men were more likely to report bisexual than homosexual behavior. This fact may represent the greater acceptance of homosexuality during the gay liberation movement of the 1960s and 1970s (a cohort effect), but we cannot exclude other reasons, such as an increasing trend with age or differences in reporting of sexual activity with age. For example, because men were asked whether they had had any male or female partners after 1977 and preceding their diagnosis of AIDS, the time period of sexual activity covered is longer for older men than for younger men, which could increase the likelihood of their having had at least one female partner.

Kaposi's sarcoma was more common in homosexual men than in bisexual men with AIDS. If bisexual men with AIDS had fewer sexual contacts with male partners than did homosexual men, this finding supports suggestions that Kaposi's sarcoma is associated with a sexually transmitted agent that is more prevalent among men who have sex with men.[14] There is some evidence that bisexual men have fewer male partners than do homosexual men. A study of 1034 single men living in San Francisco found that during a 6-month period (January to June 1984), 27% (172/641) of the homosexual men and 21% (37/173) of the bisexual men reported having had more than 10 sexual partners.[15] Preliminary data from a multicenter study of HIV-seropositive blood donors found that men who reported only homosexual contact had had a larger number of male partners since 1978 (median number of male partners = 10, n = 148) than men who reported bisexual contact (median number of male partners = 5, n = 58) (CDC, unpublished data). The hypothesis that Kaposi's sarcoma is associated with a sexually transmitted agent is also supported by the finding that Kaposi's sarcoma was more common in women who reported a bisexual male partner than in women who did not report a bisexual male partner.[14]

The higher frequency of HIV wasting syndrome in bisexual men than in homosexual men was consistently observed across racial/ethnic groups, even after the exclusion of IV drug users. This finding is more difficult to explain. Possible reasons include differences between bisexual and homosexual men with AIDS in time of diagnosis, in completeness of medical evaluation, or in conditions associated with severe weight loss.

These findings suggest that bisexual and homosexual men with AIDS are distinct. For example, more bisexual men than homosexual men reported a history of IV drug use. Similar information was found in a study of 200 male prostitutes, in which self-identified bisexual prostitutes were more likely than homosexual prostitutes to use intravenous cocaine or heroin, to be homeless, and to have "hustled" in a number of large cities.[16] Although these male prostitutes had sex for money with men, more of their other sexual encounters were with women. In preliminary data linking AIDS surveillance and death certificate information, 86% of homosexual men versus 52% of bisexual men had never married. At death, 3% of homosexual men versus 24% of bisexual men were currently married (CDC, unpublished data). Bisexual men who are married or who do not identify themselves as homosexual may be more difficult to reach, especially through gay community networks. Because of these differences, bisexual and homosexual men should be considered separately in certain research and prevention settings.

We used categories based on reported sexual behaviors, not on self-labeled sexual identity. Our "bisexual" category does not necessarily represent men who identify themselves as bisexual, but more accurately represents men with AIDS who were reported as having had sexual contact with both male and female partners since 1977. Self-identification does not necessarily predict sexual behavior, and some men who report or consider themselves to be homosexual or heterosexual actually have sex with both men and women.[1] These differences between sexual identity and sexual behavior must be considered in interpreting these findings and in counseling persons about HIV.

Nationwide, 63% of women with heterosexually acquired AIDS were infected through sexual contact with IV drug using men.[17] Rates of AIDS attributed to sexual contact with IV drug users vary widely by state and race/ethnicity, with rates ranging from 0 in some states to as high as 14.5 per 100 000 among Black women in New Jersey. Approximately 70% of all AIDS cases in women related to sexual contact with an IV drug user are reported from New York, New Jersey, Florida, and Puerto Rico. Rates of AIDS in women attributed to sexual contact with bisexual men vary less by state (ranging from 0 to 0.9 per 100 000 among black women in Florida). In some states where HIV prevalence among IV drug users is low, sexual contact with bisexual men accounts for a substantial proportion of women with heterosexually acquired AIDS.

Nearly one quarter of bisexual men with AIDS who died were married at the time of death. Because many women may not be aware of their partners' behavior,[18,19] the number of women with AIDS who have a bisexual partner is probably higher than reported. Thirteen percent of women with heterosexually acquired AIDS did not report the risk of their partner and 7% of all women with AIDS are reported without an established risk fac-

tor[7]; some of these cases may have resulted from sexual contact with bisexual men. In addition, awareness may differ by race/ethnic group; among 52 female partners of HIV-seropositive bisexual men enrolled in the California Partners' Study, 80% (28/35) of White, 20% (1/5) of Black, and 22% (2/9) of Latino women were aware of their partners' bisexuality at entry into the study.[19] Similar findings were reported from Chicago.[20] Rates for AIDS due to sexual contact with bisexual men were highest among Black and Hispanic women, yet these women may be the ones least aware of their risk. In addition, this difference in awareness would result in a greater underestimation of the rate of AIDS due to sex with bisexual men among Black and Hispanic women.

Although bisexual and homosexual men are often considered together, differences between them should be acknowledged in efforts to prevent both male-to-male and male-to-female HIV transmission. Effective AIDS risk-reduction programs that reach bisexual men who put themselves and their male and female partners at risk for HIV will require a better understanding of the patterns of bisexual behavior. Critical issues include the incidence of sexual behaviors with male and female partners, the extent of disclosure of same-sex behaviors to female partners, the social and sexual networks of bisexuals, cultural or ethnic differences in bisexual behavior, and the relationship between sexual identity and sexual behavior.[1] □

Acknowledgments

We thank Ruth L. Berkelman, MD, Sevgi O. Aral, PhD, Willard Cates, Jr, MD, and George P. Schmid, MD, for their thoughtful comments and review of this manuscript.

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