

Patterns and Correlates of Deliberate Abstinence Among Men and Women With HIV/AIDS

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As people with HIV experience improved health from antiretroviral treatment (ART), they are more able to engage in intimate relations with sexual partners.^{1,2} Nevertheless, a substantial proportion of individuals with HIV are sexually inactive.^{3–9} A study examining a 16-state sample of HIV-infected men who have sex with men found that 31% reported that they had not had oral, anal, or vaginal intercourse in the past year.⁴ In an analysis from the HIV Cost and Services Utilization Study (HCSUS),⁵ which examined a representative sample of the adult US population in care for HIV/AIDS, 32% had not engaged in vaginal, oral, or anal sex in the past 6 months; sexual inactivity was more common among heterosexual men (39%) than among women (34%) and gay/bisexual men (28%). Thus, inactivity was more prevalent in these groups than in the general population (10%–14%).^{10,11}

In 2003, the Centers for Disease Control and Prevention elevated prevention for persons living with HIV to the same level of importance as prevention for persons at risk for HIV.¹² Abstinence is one prevention strategy among several (e.g., condom use) that are directly under the control of individuals with HIV. Thus, it can have substantial effects on the course of the epidemic. Most research, however, examines other methods of risk reduction. Understanding all of the risk-reduction strategies practiced by individuals with HIV is essential for developing effective secondary prevention interventions. Knowledge about the characteristics of those who choose abstinence, and their reasons for doing so, would facilitate the design of prevention interventions tailored to those reasons. The present study analyzed the HCSUS data set to assess patterns and correlates of deliberate sexual abstinence among HIV-positive gay/bisexual men, heterosexual men, and women.

Abstinence has previously been associated with feelings of hopelessness and more severe

Objectives. We examined correlates of deliberate sexual abstinence among gay/bisexual men, heterosexual men, and women in a national probability sample of adults with HIV.

Methods. Participants in the HIV Cost and Services Utilization Study (HCSUS; n = 1339) answered questions about oral, anal, or vaginal sexual intercourse in the past 6 months; those who reported none of these behaviors (n = 415) were asked about their reasons for abstinence. Of these, 201 participants (11% of gay/bisexual men, 18% of women, 18% of heterosexual men) indicated that their abstinence was deliberate. Multivariate models were used to predict deliberate abstinence.

Results. In multivariate analyses, not having a primary relationship partner/spouse was a significant correlate of deliberate abstinence for all 3 groups. Higher perceived responsibility for limiting disease transmission and nondrinking status were related to deliberate abstinence only among gay/bisexual men. Worse health was associated with deliberate abstinence only among heterosexual men.

Conclusions. Perhaps because HIV is more common in gay communities, abstinence choices may be more closely linked to a higher sense of responsibility for reducing transmission among gay/bisexual men, and their illness may be less of an impediment to sexual activity. (*Am J Public Health.* 2006;96:1078–1084. doi:10.2105/AJPH.2005.070771)

disease among HIV-positive gay/bisexual men,⁸ and with older age, lower income, and not living with a spouse or primary partner among men and women with HIV.¹³ Although some individuals may lack opportunities for sexual partnerships, be depressed, or be physically unable to engage in sexual relations, qualitative research suggests that others deliberately choose abstinence to prevent infection. For example, gay/bisexual men, heterosexual men, and women with HIV have reported abstaining from sexual activity because they fear transmitting the virus or reinfection with other HIV strains.^{6,7} Individuals also abstain because they fear rejection by their partner if they disclose their disease.^{3,6} Although these studies of convenience samples provide some insight, their results may not accurately reflect the correlates of abstinence among HIV-infected persons nationally.

The correlates of abstinence are likely to vary across subgroups at high risk for HIV. Higher acculturation to and residence within

gay communities are related to safer sexual activity and exposure to gay-related media, including educational HIV-prevention messages.^{14–16} Because engaging in sexual activity seems to play a critical role in affirming gay identity,¹⁷ and prevention messages and community norms may make alternatives to abstinence (e.g., condom use, less risky sexual practices) salient, gay/bisexual men may be less likely to deliberately abstain than women and heterosexual men. On the other hand, acculturation may also promote an internalized sense of responsibility for limiting transmission out of a sense of duty to one's partner and gay/bisexual men generally. Such internalized beliefs may be linked to a range of safer sexual behaviors, including abstinence. We hypothesized that gay/bisexual men would be less likely to deliberately abstain than women and heterosexual men, and that attitudinal factors regarding responsibility for transmission and substance use would be important predictors of abstinence for gay/bisexual men.

Other correlates are likely to be similar across gender and sexual orientation. Physical health is an immediate and salient factor that likely influences the decision to abstain. Individuals may be less likely to seek sexual activity and initiate sexual contact if they fear that their sickness will be noticeable, or if sexual activity takes too much effort. We hypothesized that physical and mental health functioning and disease progression influence the decision to abstain, regardless of gender or sexual orientation.

Those who are not in committed partnerships may choose abstinence because they do not want to have sexual intercourse until they are in a committed partnership, or to avoid rejection by potential new partners. For those in relationships, abstinence is dependent on the partner's desires as well. Therefore, we controlled for the likely strong negative association between having a primary relationship partner and deliberate abstinence.

METHODS

Sample and Procedure

Data were collected by the Risk and Prevention follow-up ($n=1421$) to the HCSUS, which used multistage national probability sampling to select random samples of geographic areas, medical providers, and adults with known HIV infection who had at least 1 health care visit at a facility other than a military provider, prison, or emergency department from January 1996 to February 1996.^{18,19}

Of the 4042 eligible patients sampled for HCSUS, 2864 completed baseline interviews between January 1996 and March 1997, 2466 completed first follow-up interviews between December 1996 and July 1997, and 2267 completed second follow-up interviews between August 1997 and January 1998. Patients who completed the second follow-up survey were randomly selected for the Risk and Prevention follow-up, after stratifying by primary sampling unit, type of health care provider, age, ethnicity, and sexual orientation. English-speaking patients whose gender was unambiguous, on the basis of HCSUS interviewer and self-report data, were eligible. To limit data

collection costs, the Risk and Prevention follow-up undersampled the largest subgroups: White gay men aged 40 and older (sampling probability = 1/3) and White gay men aged 39 and younger (sampling probability = 4/9). All other groups were sampled with a probability of 1.00.

Among the 1794 eligible participants sampled face-to-face, 1421 completed computer-assisted interviews between September and December 1998, yielding a response rate of 79% (84% after adjustment for known mortality). The present analysis excluded 15 who reported never having sexual intercourse in their lifetime, 67 with missing data (21 on sexual orientation, 9 on ART, 12 on sexual activity, and 25 sexually inactive individuals who skipped questions on deliberate abstinence because of programmer error), resulting in a sample of 1339.

Measures

The present analyses used age, gender, race/ethnicity, education, income, and time since diagnosis from the baseline HCSUS survey, substance use from the 2 follow-up HCSUS surveys, and CD4 count from all surveys. Other variables were from the Risk and Prevention follow-up survey. Items concerning sexual behavior and abstinence were collected via computer-assisted self interviewing.

Deliberate abstinence. Those who reported no oral, anal, or vaginal sexual intercourse in the past 6 months were asked the importance of different reasons for their inactivity. Two reasons were used to assess deliberate abstinence: "You have decided to take some 'time-off' from having sex," and "You have made a decision not to ever have sex again." Response options were *not at all important*, *somewhat important*, and *very important*. Respondents were classified as deliberately abstinent if they were not sexually active and rated either of the 2 reasons as *very important*; all others were considered not deliberately abstinent (sexually active or nondeliberately abstinent).

Sociodemographic characteristics. Respondents reported their age, gender, race/ethnicity, education, and income.

Gender/sexual orientation group. Self-reported sexual identity at the Risk and Prevention

follow-up was combined with baseline gender from HCSUS to derive 3 gender/sexual orientation groups: women, heterosexual men, and gay/bisexual men. Too few women were gay/bisexual (6.5%) to examine as a separate subgroup.

Transmission-responsibility beliefs. Perceived responsibility to protect sexual partners from HIV transmission was based on 2 items: "It's not your responsibility to protect your sex partners from HIV," and "If you are HIV-positive, it's your responsibility to be sure the epidemic does not spread through your actions." Response options were *strongly agree*, *agree*, *disagree*, and *strongly disagree*. Responses to the first item were reverse-scored and dichotomized into *strongly disagree* versus *disagree*, *agree*, and *strongly agree*; responses to the second item were dichotomized into *agree*, *disagree*, and *strongly disagree* versus *strongly agree*. The mean of the 2 dichotomous variables was computed.

Treatment-related transmission optimism was based on agreement with 2 items: "An HIV-positive person who is on combination therapy (such as protease inhibitors or cocktail therapy) is unlikely to give the virus to a sexual partner," and "An HIV-positive person whose viral load is low or undetectable can't spread HIV to others," with response options *strongly agree*, *agree*, *disagree*, and *strongly disagree*. Responses were coded as 1 for those who strongly agreed with both items, and zero for others.

Relationship status. Participants were asked their marital status and whether they currently had a primary relationship partner. Those who responded *yes* to either or both questions were classified as having a primary relationship partner/spouse.

Antiretroviral treatment. Participants were shown names and photographs of all antiretroviral medications available and asked to report which medications they were currently taking. Responses were categorized as taking or not taking ART.

Lowest CD4 count. Lowest-ever CD4 count was self-reported in all HCSUS and Risk and Prevention follow-up surveys. The lowest count was used in analyses.

Physical functioning and emotional well-being. Participants were administered the

physical and mental health subscales of the RAND 36-Item Short-Form Health Survey.²⁰ Each subscale's items were averaged and standardized to a 0-to-100 scale.

Time since HIV diagnosis. Self-reported date of first positive HIV test was recorded.

Substance use. Alcohol consumption was categorized as nondrinking, drinking but not binge drinking, or binge drinking in the past 4 weeks. Drinking was defined as any alcohol consumption; binge drinking was defined as consumption of 5 or more drinks in 1 day. Drug dependence was based on self-reports of having used amphetamines, marijuana, cocaine, inhalants, hallucinogens, or heroin. Those who reported using drugs were asked whether (1) they had needed larger amounts to get the same effect, or if the same amount had ever had less effect than previously, and (2) they had ever experienced any emotional or psychological problems from the drugs. Follow-up questions determined the timing of (1) and (2). Respondents were classified as never dependent, previously dependent but not in the past 12 months, or currently dependent.

Statistical Analysis

Descriptive statistics were calculated within each gender/sexual orientation group. A χ^2 test was used to determine whether deliberate abstinence was less prevalent for gay/bisexual men than heterosexual men or women. Stratified bivariate logistic regression analyses examined the relationships between potential correlates and deliberate abstinence separately for women, gay/bisexual men, and heterosexual men.

To test for differences in predictors of deliberate abstinence among the 3 groups, a multivariate logistic regression model included all of the potential correlates of deliberate abstinence; the interaction between each correlate and gender/orientation group was added to this model individually. For significant interactions, posthoc 1-degree-of-freedom interaction tests comparing 2 gender/orientation groups at a time were used to determine the pattern of differences, and stratified multivariate logistic regression models were used to examine significant correlates within each group. All posthoc tests included all potential correlates of deliberate abstinence.

Analytic weights were applied to represent a population of 197 063 HIV-positive adults receiving medical care in the contiguous United States in 1996 and surviving until 1998. These weights take into account differential selection probabilities, nonresponse, multiplicity, and attrition.

RESULTS

Sample Characteristics

Of the 1339 respondents, 415 participants were sexually inactive; 201 of the latter were deliberately abstinent. More women (18%)

and heterosexual men (18%) were deliberately abstinent than gay/bisexual men (11%; $\chi^2 [2] = 15.46$; $P < .01$). Most other characteristics also differed across gender/orientation, with the exception of CD4 count, ART status, and perceived responsibility to limit HIV transmission (Table 1).

Bivariate Predictors of Deliberate Abstinence

In bivariate analyses, not having a primary relationship partner/spouse was the only common predictor of deliberate abstinence across the gender/orientation groups

TABLE 1—Characteristics of the Sample, by Gender/Sexual Orientation

	Gay/Bisexual Men (n = 586)	Heterosexual Men (n = 274)	Women (n = 479)
Mean age, y (SE)†	40.8 (0.3)	45.1 (0.4)	38.6 (0.6)
Race/ethnicity, %†			
White	74.8	33.3	29.4
Black	14.6	52.0	53.9
Hispanic	10.6	14.8	16.7
Education, %†			
Some high school	10.1	36.9	42.9
High-school graduate	25.2	33.0	30.8
Some college	31.0	22.9	22.1
4-year college degree	33.7	7.2	4.2
Primary relationship partner/spouse, %***	63.2	73.8	74.6
Transmission responsibility, mean (SE)	0.6 (0.0)	0.6 (0.1)	0.5 (0.0)
Transmission optimism, %†	52.8	68.5	68.5
Any ART, %*	88.1	90.3	83.1
CD4 count, %			
≥ 500	4.5	6.2	5.8
200–499	36.8	32.6	43.2
50–199	33.9	35.02	30.3
0–49	24.8	26.2	20.8
Physical functioning, mean (SE)***	8.6 (0.1)	7.9 (0.1)	7.9 (0.2)
Emotional well-being, mean (SE)***	7.0 (0.1)	6.7 (0.2)	6.5 (0.1)
Years since HIV diagnosis, mean (SE)†	8.0 (0.2)	6.5 (0.1)	6.3 (0.1)
Drug dependence**			
Never	67.5	51.7	58.7
Previous	23.8	40.3	30.9
Current	8.7	8.0	10.4
Alcohol use†			
None	31.1	56.8	62.2
Drinker	49.9	27.4	27.8
Binge drinker	19.0	15.7	10.0

Note. ART = antiretroviral treatment.

* $P < .10$; ** $P < .05$; *** $P < .01$; † $P < .001$.

TABLE 2—Results of Bivariate Logistic Regression Models Predicting Deliberate Abstinence, by Gender/Sexual Orientation

	Gay/Bisexual Men, OR (95% CI)	Heterosexual Men, OR (95% CI)	Women, OR (95% CI)
Sociodemographics			
Age	1.1 (1.0, 1.1)†	1.0 (1.0, 1.1)	1.1 (1.1, 1.1)†
Race/ethnicity ^a			
Black	1.9 (1.0, 3.6)**	0.5 (0.2, 1.2)	1.3 (0.8, 2.0)
Hispanic	0.9 (0.4, 2.0)	0.3 (0.1, 1.1)*	0.9 (0.5, 1.5)
Education ^b			
High-school graduate	0.7 (0.3, 1.8)	1.6 (0.8, 3.3)	0.6 (0.3, 1.3)
Some college	0.8 (0.3, 2.3)	1.1 (0.4, 3.4)	0.8 (0.4, 1.8)
≥4-year degree	0.6 (0.2, 1.7)	1.5 (0.6, 3.9)	1.9 (0.7, 4.9)
Primary relationship partner/spouse	0.1 (0.1, 0.2)†	0.2 (0.1, 0.4)†	0.1 (0.0, 0.1)†
Transmission-related beliefs			
Transmission-responsibility beliefs	3.9 (2.1, 7.3)†	0.7 (0.4, 1.3)	1.3 (0.5, 3.5)
Transmission-related transmission optimism	0.4 (0.2, 0.3)**	1.4 (0.5, 3.7)	0.8 (0.4, 1.6)
Health factors			
Any ART ^c	1.1 (0.6, 2.2)	0.3 (0.1, 0.6)†	1.2 (0.6, 2.6)
CD4 count ^d			
≥500	0.4 (0.1, 2.1)	0.8 (0.1, 7.7)	0.1 (0.0, 0.7)**
200–499	0.5 (0.2, 1.4)	0.3 (0.1, 0.9)**	0.4 (0.2, 0.9)**
50–199	0.5 (0.2, 1.1)*	0.7 (0.3, 1.5)	0.5 (0.3, 1.2)
Physical functioning	0.9 (0.8, 1.0)**	0.9 (0.8, 1.0)**	0.8 (0.7, 0.9)†
Emotional well-being	1.0 (0.9, 1.1)	0.9 (0.7, 1.0)*	1.0 (0.9, 1.2)
Years since diagnosis	0.9 (0.8, 1.0)	1.0 (1.0, 1.1)	1.0 (0.9, 1.1)
Substance use			
Drug dependence ^e			
Previous	1.0 (0.4, 2.1)	0.9 (0.4, 2.2)	0.7 (0.4, 1.2)
Current	0.6 (0.2, 1.8)	0.5 (0.1, 3.4)	0.9 (0.5, 1.6)
Alcohol use ^f			
Drinker	0.3 (0.2, 0.6)†	1.5 (0.7, 2.9)	0.5 (0.3, 0.8)***
Binge drinker	0.4 (0.2, 1.0)*	1.1 (0.5, 2.1)	0.4 (0.2, 0.8)***

Notes. OR = odds ratio; CI = confidence interval; ART = antiretroviral treatment. Analyses were stratified by gender/sexual orientation group.

^aReference group = gay/bisexual men.

^bReference group = White.

^cReference group = less than high school.

^dReference group = CD4 count < 50.

^eReference group = never dependent.

^fReference group = nondrinker.

* $P < .10$; ** $P < .05$; *** $P < .01$; † $P < .001$ for within-group differences.

Multivariate Predictors of Deliberate Abstinence

In the multivariate model, the likelihood of deliberate abstinence was higher among women and heterosexual men, respondents who were older, and those with a stronger sense of responsibility; it was lower among those who had a primary relationship partner/spouse, were on ART, had CD4 counts of 50 or higher, and were drinkers (Table 3, Main Effects Model).

As hypothesized, a posthoc interaction test indicated that the effect of perceived responsibility on deliberate abstinence was significantly greater for gay/bisexual men than for heterosexual men (OR=0.1; 95% CI=0.0, 0.4; $P < .001$) (Table 3, Interaction With Gender/Sexual Orientation). The likelihood of deliberate abstinence was higher among gay/bisexual men who had a stronger sense of responsibility (OR=5.1; 95% CI=2.0, 12.8; $P < .001$); the corresponding effect was nonsignificant among women and heterosexual men (both $P > .05$).

We also predicted that health-related factors would have similar effects across groups. The overall model indicated that individuals with CD4 counts of 50 or higher were less likely to deliberately abstain; this effect was not qualified by gender/sexual orientation. However, the interactions in Table 3, and posthoc interaction and stratified tests, indicated that the likelihood of deliberate abstinence was higher among gay/bisexual men and women versus heterosexual men who were on ART (OR=4.2; 95% CI=1.4, 12.8; $P < .05$ and OR=4.1; 95% CI=1.3, 12.6; $P < .05$, respectively) and who had higher emotional well-being (OR=1.0; 95% CI=1.0, 1.0; $P < .01$). Posthoc tests also indicated that the likelihood of deliberate abstinence was higher among drinkers who were heterosexual men versus gay/bisexual men (OR=4.2; 95% CI=1.8, 9.7; $P < .001$). Although stratified models also indicated that deliberate abstinence was related to lower CD4 counts among women and men, worse physical functioning among women, and nondrinking (vs binge drinking) among gay/bisexual men, the corresponding interaction tests were not significant. Small subgroup sample sizes may have limited the power to detect effects. For example, the highest CD4

(Table 2). Among gay/bisexual men, deliberate abstinence was related to older age, being Black, higher perceived responsibility for protecting sexual partners, less optimism about the effects of ART on transmissibility, and worse physical functioning; deliberate abstinence was less likely among gay/bisexual men who were drinkers. Among heterosexual men, deliberate abstinence was significantly

related to not using ART, having a CD4 count lower than 50 (vs between 200 and 499), and worse physical functioning. Among women, deliberate abstinence was associated with older age, CD4 counts less than 50 (vs 200 or greater), and worse physical functioning; women who were drinkers or binge drinkers had a lower likelihood of deliberate abstinence.

TABLE 3—Results of Multivariate Logistic Regression Models Predicting Deliberate Abstinence in Overall Sample

	Main Effects Model, OR (95% CI)	Interaction With Gender/Sexual Orientation, F(df)
Transmission-related beliefs		
Responsibility	1.8 (1.1, 2.8)**	6.5 (2, 47)***
Optimism	0.8 (0.5, 1.3)	1.8 (2, 47)
Sociodemographics		
Gender/sexual orientation ^a		
Heterosexual men	1.8 (1.0, 3.0)**	...
Women	2.1 (1.4, 3.3)†	...
Age	1.0 (1.0, 1.1)***	1.7 (2, 47)
Race/ethnicity ^b		3.5 (4, 45)**
Black	1.0 (0.6, 1.6)	
Hispanic	0.8 (0.4, 1.5)	
Education ^c		1.6 (6, 43)
High-school graduate	0.9 (0.6, 1.5)	
Some college	1.0 (0.6, 1.6)	
≥ 4-year degree	0.7 (0.4, 1.3)	
Primary relationship partner/spouse	0.1 (0.1, 0.2)†	2.5 (2, 47)*
Health factors		
Any ART	0.6 (0.4, 0.9)**	4.7 (2, 47)**
CD4 count ^d		1.6 (6, 43)
≥ 500	0.2 (0.0, 1.3)*	
200–499	0.4 (0.3, 0.7)***	
50–199	0.5 (0.3, 0.9)**	
Physical functioning	0.9 (0.8, 1.0)*	1.3 (2, 47)
Emotional well-being	1.0 (0.9, 1.1)	4.5 (2, 47)**
Years since diagnosis	1.0 (0.9, 1.0)	1.6 (2, 47)
Substance use		
Drug dependence ^e		0.0 (4, 45)
Previous	1.0 (0.6, 1.6)	
Current	0.6 (0.4, 1.1)*	
Alcohol use ^f		3.2 (4, 45)**
Drinker	0.5 (0.3, 0.8)***	
Binge drinker	0.6 (0.4, 1.1)*	

Notes. The main effects model and the interaction models used the entire sample and contained all multivariate predictors. The main effects model did not include any interaction tests. OR = odds ratio; CI = confidence interval; ART = antiretroviral treatment.

^aReference group = gay/bisexual men.

^bReference group = White.

^cReference group = less than high school.

^dReference group = CD4 count < 50.

^eReference group = never dependent.

^fReference group = nondrinker.

* $P < .10$; ** $P < .05$; *** $P < .01$; † $P < .001$.

95% CI=1.7, 15.7; $P < .01$ and OR=2.9; 95% CI=1.2, 6.9; $P < .05$, respectively). The effect of being Black was not significant in the stratified models, although the likelihood of deliberate abstinence was marginally higher among Black versus White gay/bisexual men (OR=1.9; 95% CI=0.9, 4.3; $P < .10$). The lack of significant findings in the stratified models was most likely caused by insufficient power.

In all 3 groups, the likelihood of deliberate abstinence was significantly greater among those without a primary relationship partner/spouse, compared with those with a partner/spouse (Gay/bisexual men: OR=0.1; 95% CI=0.0, 0.2; $P < .001$. Heterosexual men: OR=0.2; 95% CI=0.1, 0.4; $P < .001$. Women: OR=0.1; 95% CI=0.0, 0.1; $P < .001$).

DISCUSSION

Using a national probability sample of people receiving care for HIV/AIDS, we examined variation in the prevalence and correlates of deliberate abstinence overall and by gender/sexual orientation. A substantial proportion of participants chose abstinence, and, as hypothesized, women and heterosexual men were more likely to deliberately abstain than were gay/bisexual men. Gay/bisexual men who deliberately abstained were more likely than women and heterosexual men to be motivated by a perceived responsibility to protect others. Prevention messages and community norms may make gay/bisexual men more aware than women and heterosexual men of lower-risk alternatives to abstinence. Community norms may also contribute to an internalized sense of responsibility for stemming the epidemic within the gay community, thereby influencing risk-reduction practices, including the decision to abstain.

Health factors were more strongly associated with deliberate abstinence among women and heterosexual men than gay/bisexual men. Compared with gay/bisexual men, heterosexual men not taking ART and with poorer emotional functioning were more likely to be deliberately abstinent. Health factors, including worse physical functioning and lower CD4 count, also predicted deliberate abstinence for women, although these effects were not significantly different from those for gay/bisexual men. Gay/bisexual men may be

count category contained very few participants (Table 1).

Aside from gender/sexual orientation, we did not hypothesize sociodemographic differences in deliberate abstinence. The significant

interaction of Black race/ethnicity by gender/orientation indicated that the effect of being Black on deliberate abstinence was significantly greater for gay/bisexual men and women versus heterosexual men (OR=5.1;

less concerned about finding a partner who accepts their illness, perhaps because of lower stigmatization of HIV and the relatively higher availability of support within gay communities for HIV-positive individuals. Thus, illness severity may be less of an impediment to sexual intercourse for gay/bisexual men.

Our results also indicated that gay/bisexual men who drink were less likely to deliberately abstain, although the effect for drug use was nonsignificant. Researchers and practitioners have recognized the need to reduce substance use to effectively promote safer sexual behaviors, especially among gay/bisexual men.^{21,22} Our findings may be relevant for targeting public health prevention programs for gay/bisexual men. Further research is warranted to help understand the different patterns of results for gay/bisexual men and alcohol.

Although not predicted, we found that Black gay/bisexual men were more likely than White gay/bisexual men to abstain. Homophobia in minority communities is thought to contribute to a greater percentage of Black than White men who have sex with men who identify as bisexual or heterosexual rather than gay, or choose not to disclose their sexuality to friends and family.^{23,24} Black gay/bisexual men may be more likely to abstain from sexual intercourse because of stigma within their own social networks and isolation from gay communities. They may be more cautious about initiating sexual relations or have less information on lower-risk sexual practices. Nevertheless, little is known regarding the sexual behavior of Black men who have sex with men, and additional research is needed.

Because HCSUS sampled only patients in care, results may not be generalizable to those who underuse, or have poor access to, health care. Although we employed computer-assisted self interviewing under conditions protecting confidentiality, abstinence reports may have nonetheless been subject to social desirability biases. The data for the present study, gathered in 1998, are several years old. However, there have been no major developments in the field of HIV treatment or prevention since 1998, and ART continues to be the most effective therapy for HIV. Nor is there reason to believe that the correlates of abstinence have changed. Thus,

these results have relevance for the current HIV epidemic.

The main study analyses compared deliberately abstinent individuals to all others with HIV, whether recently sexually active or not. By combining the 2 latter groups, we were unable to examine whether the predictors of deliberate versus nondeliberate abstinence differed. In a posthoc analysis, we used multinomial logistic regression to compare predictors of the 2 groups. Results indicated that the correlates of deliberate and nondeliberate abstinence (vs sexual activity) are similar, and consistent with the results in Table 3, with 1 exception: Any alcohol use versus nondrinking was a significant negative correlate of deliberate abstinence, but not nondeliberate abstinence. Although we did not assess whether the nondrinking was deliberate, abstinence from both sexual intercourse and alcohol could stem from a desire to exert control over one's illness by purposefully constraining behaviors. Another analysis of the HCSUS data set²⁵ suggested that individuals who made active efforts to control their illness were also more likely to reduce alcohol and drug use following diagnosis. Abstaining from sexual intercourse may reflect a similar motive and strategy.

Our cross-sectional results define deliberate abstinence for a 6-month period; we do not know the proportion of respondents who remained abstinent or subsequently became abstinent. In addition, because of use of cross-sectional methodology, causality cannot be established. For example, individuals with worse emotional health may be less motivated to initiate or maintain sexual relationships, individuals who choose abstinence may suffer emotional consequences, or the relationship between mental health and abstinence may be bidirectional. Further, the somewhat self-evident relationship between primary partner status and deliberate abstinence may be bidirectional. Individuals may choose not to have a partner because of their decision to abstain, or feel they have no option to abstain if they have a partner.

Abstinence is only 1 option that individuals with HIV/AIDS may consider when trying to reduce transmission risk. We did not examine other safer sexual behaviors, such as engaging in nonpenetrative sexual behaviors, using

condoms, and engaging in sexual activities only with HIV-positive partners. Each alternative carries different levels of HIV transmission risk, and a choice among alternatives may depend on the goals and sexual needs of an individual and his or her partners. Our results cannot be extrapolated to these behaviors, nor should our focus on abstinence suggest that it is the only choice.

In sum, the present data allowed for a comprehensive investigation of the prevalence and reasons for deliberate abstinence among people living with HIV in the United States. In a national probability sample, nearly one-fifth of women and heterosexual men, and slightly more than one-tenth of gay/bisexual men, chose to abstain from sexual intercourse, and their reasons varied by gender and sexual orientation. Previous research using small convenience samples could not provide such a global and representative picture of deliberate abstinence across different groups at risk for HIV. Our findings can inform the design of secondary prevention interventions by suggesting one potential strategy to reduce transmission risk that is acceptable to and currently practiced by a substantial proportion of people with HIV. ■

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Contributors

L. M. Bogart led the origination of the hypotheses, interpretation of the results, and writing of the article. R. L. Collins designed the Risk and Prevention research protocol, helped with study design, and contributed to the writing of the article. D. E. Kanouse helped with the study design and contributed to the writing of the article. W. Cunningham contributed to the origination and design of the study and reviewed all drafts of the article. R. Beckman conducted the data analyses and helped with data interpretation. D. Golinelli oversaw the data analyses and reviewed the statistical content of the article. C. E. Bird obtained funding, led the research study, and contributed to the writing of the article. All of the authors participated in hypothesis generation and data interpretation.

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Human Participant Protection

The institutional review board of RAND Corp approved this study.

References

- Dukers NH, Goudsmit J, de Wit JB, Prins M, Weverling GJ, Coutinho RA. Sexual risk behaviour relates to the virological and immunological improvements during highly active antiretroviral therapy in HIV-1 infection. *AIDS*. 2001;15:369–378.
- Vlahov D, Safaie M, Lai S, et al. Sexual and drug risk-related behaviours after initiating highly active antiretroviral therapy among injection drug users. *AIDS*. 2001;15:2311–2316.
- Adam BD, Sears A. Negotiating sexual relationships after testing HIV-positive. *Med Anthropol*. 1994; 16:63–77.
- Centers for Disease Control and Prevention. High-risk sexual behavior by HIV-positive men who have sex with men – 16 sites, United States, 2000–2002. *MMWR Morb Mortal Wkly Rep*. 2004;53:891–894.
- Cicarone DH, Kanouse DE, Collins RL, et al. Sex without disclosure of positive HIV serostatus in a US probability sample of persons receiving medical care for HIV infection. *Am J Public Health*. 2003;93: 949–954.
- Siegel K, Schrimshaw EW. Reasons for the adoption of celibacy among older men and women living with HIV/AIDS. *J Sex Res*. 2003;40:189–200.
- Siegel K, Raveis VH. AIDS-related reasons for gay men's adoption of celibacy. *AIDS Educ Prev*. 1993;5: 302–310.
- Wagner GJ, Rabkin JG, Rabkin R. Sexual activity among HIV-seropositive gay men seeking treatment for depression. *J Clin Psychiatry*. 1993;54:470–475.
- Wenger NS, Kusseling FS, Bech K, Shapiro MF. Sexual behavior of individuals infected with the human immunodeficiency virus. The need for intervention. *Arch Intern Med*. 1994;154:1849–1854.
- Laumann EO, Gagnon JH, Michael RT, Michaels S. *The Social Organization of Sexuality: Sexual Practices in the United States*. Chicago, Ill: University of Chicago Press; 1994.
- Leigh BC, Temple MT, Trocki KF. The sexual behavior of US adults: results from a national survey. *Am J Public Health*. 1993;83:1400–1408.
- Wolitski RJ, Janssen RS, Onorato IM, Purcell DW, Crepaz N. An overview of prevention with people living with HIV. In: Kalichman SC, ed. *Positive Prevention: Reducing HIV Transmission Among People Living With HIV/AIDS*. New York, NY: Kluwer Academic/Plenum Publishers; 2005.
- Reilly T, Woo G. Predictors of high-risk sexual behavior among people living with HIV/AIDS. *AIDS Behav*. 2001;5:205–217.
- Mills TC, Stall R, Pollack L, et al. Health-related characteristics of men who have sex with men: a comparison of those living in "gay ghettos" with those living elsewhere. *Am J Public Health*. 2001;91:980–983.
- Ramirez-Valles J. The protective effects of community involvement for HIV risk behavior: A conceptual framework. *Health Educ Res*. 2002;17:389–403.
- Seibt AC, Ross MW, Freeman A, et al. Relationship between safe sex and acculturation into the gay subculture. *AIDS Care*. 1995;7(suppl 1):S85–S88.
- Halkitis PN, Wilton L. The meanings of sex for HIV-positive gay and bisexual men: Emotions, physicality, and affirmations of self. In: Halkitis PN, Gomez CA, Wolitski RJ, eds. *HIV+ Sex: The Psychological and Interpersonal Dynamics of HIV-Seropositive Gay and Bisexual Men's Relationships*. Washington, DC: American Psychological Association; 2005.
- Bozzette SA, Berry SH, Duan N, et al. The care of HIV-infected adults in the United States. HIV Cost and Services Utilization Study Consortium. *N Engl J Med*. 1998;339:1897–1904.
- Shapiro MF, Morton SC, McCaffrey DF, et al. Variations in the care of HIV-infected adults in the United States: results from the HIV Cost and Services Utilization Study. *JAMA*. 1999;281:2305–2315.
- Hays RD, Cunningham WE, Sherbourne C, et al. Health-related quality of life in patients with human immunodeficiency virus infection in the United States: results from the HIV Cost and Services Utilization Study. *Am J Med*. 2000;108:714–722.
- Kelly JA, Kalichman SC. Behavioral research in HIV/AIDS primary and secondary prevention: recent advances and future directions. *J Consult Clin Psychol*. 2002;626–639.
- Stein M, Herman DS, Trisvan E, Pirraglia P, Engler P, Anderson BJ. Alcohol use and sexual risk behavior among human immunodeficiency virus-positive persons. *Alcohol Clin Exp Res*. 2005;29:837–843.
- Doll LS, Beeker C. Male bisexual behavior and HIV risk in the United States: synthesis of research with implications for behavioral interventions. *AIDS Educ Prev*. 1996;8:205–225.
- Kenamer JD, Honnold J, Bradford J, Hendricks M. Differences in disclosure of sexuality among African American and White gay/bisexual men: implications for HIV/AIDS prevention. *AIDS Educ Prev*. 2000;12: 519–531.
- Collins RL, Kanouse DE, Gifford AL, et al. Changes in health-promoting behavior following diagnosis with HIV: prevalence and correlates in a national probability sample. *Health Psychol*. 2001;20:351–360.

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