Published in final edited form as:

AIDS Behav. 2006 September ; 10(5): 495–507. doi:10.1007/s10461-006-9089-3.

Correlates of Sex Without Serostatus Disclosure Among a National Probability Sample of HIV Patients

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Abstract

We examined potential correlates of sex without HIV disclosure within a sample of 875 participants from the HIV Cost and Services Utilization Study. Interviews with each participant assessed sexual activities with up to six recent partners, and this study included both respondent and partnership characteristics. Compared with marriage and/or primary same-sex relationships, occasional partnerships and one-time encounters were associated with sex with disclosure, and shorter relationships were more likely to involve sex without disclosure. Knowledge of partner serostatus was also associated with sex without disclosure. Women were less likely to have sex without disclosure than men having sex with men. We found an association between the perceived duty to disclosure to all partners and sex without disclosure, while we found no association in multivariate analyses between outcome expectancies and sex without disclosure.

Keywords

Disclosure; Sexual behavior; HIV-positive adults; Cross-sectional study

Introduction

Almost three-quarters of people with HIV infection remain sexually active after diagnosis (Marks, Burris, & Peterman, 1999). Many of those who do so face difficult personal situations related to disclosure of their positive serostatus, balancing the desire to be forthright with prospective sexual partners against the risk of rejection. Within a nationally representative sample, 28% of HIV-positive individuals report engaging in sex without disclosure of their serostatus within a 6-month period (Ciccarone et al., 2003). Rates of disclosure of HIV positivity to sexual partners vary from approximately 2% to as high as 75% of respondents in other studies, due in part to the use of different outcome measures. For example, within diverse populations, researchers have reported disclosure of HIV-positive status to all sex partners within the past 6 months (Stein et al., 1998), to any partner within the past 12 months (Marks et al., 1992) and to the last sex partner (Niccolai, Dorst, Myers, & Kissinger, 1999). Despite these differences in methodology, it appears clear that at least a substantial minority of people with HIV do not disclose their seropositivity to all of their sex partners.

The goal of the present paper is to identify correlates of this non-disclosure. In so doing, we assume that disclosure of HIV-positive status to a sexual partner is conceptually complex. Such disclosures can be conceived of as morally prescribed, prosocial behavior arising from a sense of personal responsibility, as one aspect of an interpersonal relationship (whether close or casual), as a health behavior, or as legally dictated. Given the conceptual complexity of disclosure, it is likely to be influenced by multiple beliefs, expectations, and situational factors. Several theoretical perspectives directly or indirectly bear on the issue, and suggest some of these potential correlates.

Disclosure of personal information, a category in which seropositive HIV status certainly fits, is also the theoretical basis of intimacy between two individuals, and intimacy level is a defining feature of relationships, whether close or not, and whether sexual or not (Reis & Patrick, 1997; Reis & Shaver, 1988). Intimacy is the result of a recursive, interactive process in which one individual discloses and the other responds. These responses are a key determinant of the discloser's perceptions regarding whether he or she is understood, valued, and cared for by the other, and these perceptions in turn influence further disclosure, and whether the relationship continues, develops, or terminates. The motives, goals and fears of both partners also influence this feedback loop. Thus, disclosure of HIV-positive status can be seen as both a contributor to and outcome of the relationship between potential sex partners.

This theory suggests that disclosure will be more common within close relationships, both because such relationships may produce disclosure, and because disclosure, when responded to positively, may lead to greater closeness. Reports in the literature confirm that individuals in an exclusive sexual relationship are more likely to have disclosed their HIV-positive status to their partners (Marks et al., 1992; Perry et al., 1994; Stein et al., 1998; Niccolai et al., 1999; Klitzman & Bayer, 2003). Disclosures of HIV positivity may also be more likely in relationships of longer duration (independent of whether the relationship is close), since higher levels of intimacy and greater opportunity for information exchange are likely over time. Interviews of people with HIV document that expectations of trust and honesty are common within intimate relationships and influence disclosure behaviors (Klitzman & Bayer, 2003). Disclosure is also likely to be reciprocal (Kenny, 1994). Indeed, if an individual or a potential partner discloses his/her serostatus without reciprocation, sex may not take place. Knowledge of a sexual partner's serostatus, either positive or negative, appears to be related to disclosure of one's own status to that partner (D'Angelo, Abdalian, Sarr, Hoffman, & Belzer, for the Adolescent Medicine HIV/AIDS Research Network, 2001; DeRosa & Marks, 1998; Marks et al., 1994).

Anticipated partner reactions to disclosure are likely to play as strong a role as actual reactions. If individuals believe a potential sex partner will respond with anger or refusal of sex, they are probably less likely to reveal their HIV-positive status. Similarly, if there is an imbalance in power between the two partners, disclosure before sex may be less probable. HIV-positive individuals who have less power than their partner may have stronger reasons to fear negative reactions and rejection (Simoni, 2005). Factors that may lead to relatively less power may include having been abused by the partner, exchanging sex for money and/or goods from this partner, and being much younger or much older than the potential sex partner.

Both HIV ethicists and people living with HIV articulate moral arguments in support of disclosing HIV positivity. Bruner holds that widely shared moral values emphasizing the need to take care of one another compel disclosing HIV-positive status to sex partners (Bruner, 2004). Others write that within sexual partnerships, the possibility that a partner will assume seronegativity obligates HIV-positive disclosure (Bennett, Draper, & Frith, 2000). Individuals with HIV themselves have affirmed, in qualitative interviews, that issues of moral responsibility and informed consent obligate disclosure to sexual partners in certain situations

(Klitzman & Bayer, 2003; Sobo, 1995). As we noted elsewhere, failing to disclose HIV-positive status might be considered “morally indefensible because it precludes the partner’s exercising informed choice about the level of risk he or she would like to assume” (Ciccarone et al., 2003).

Thus, positive serostatus disclosure is arguably a prosocial action. One theory of prosocial behavior suggests that disclosure of HIV-positive status may be associated with an individual’s level of religiosity, because of strong altruistic tendencies associated with many religions (Batson, 1991). Other theories of prosocial behavior hold that altruistic actions are a function of perceived responsibility for others’ well being (Latane & Darley, 1970). In the case of HIV, the perception of responsibility may exist at two different levels. Prior work has shown that some individuals with HIV disclose in response to a perceived duty to notify all sexual partners of their infection (Serovich & Mosack, 2003), while others believe that disclosure is required, but only in “high-risk” situations for transmitting the disease (Wolitski, Bailey, O’Leary, Gomez, & Parsons, for the Seropositive Urban Men’s Study, 2003).

From the public health perspective, disclosure of HIV status may be related to whether risky sex takes place. Open communication may both motivate safer sex practices and facilitate negotiation of protection (Norman, Kennedy, & Parish, 1998). Disclosure should be most likely to prevent new HIV infections when it takes place prior to sex, since only antecedent disclosure can lead to safer sex behaviors. For that reason, public health agencies are increasingly addressing disclosure of HIV positivity to sexual partners as one of many preventive efforts to reduce the spread of HIV (Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, 2001). However, a review of the literature to date found no consistent association between disclosure of HIV positivity and safer sex, with the caveat that information on partner serostatus, exact definitions of disclosure and risky sex, and the timing of disclosure varied between studies (Simoni & Pantalone, 2004). Partner serostatus is a key influence on post-disclosure sexual practices, as disclosure of HIV-positive status to partners who are also HIV-positive often leads to unprotected sex, whereas disclosure of HIV-positive status to HIV-negative partners may lead to safer sex negotiation and safer sex behaviors (Marks, Richardson, & Maldonado, 1991; Prestage, Van de Ven, Grulich, Kippax, McInnes, et al., 2001; Semple, Patterson, & Grant, 2000).

One of the most well established theories of health behavior is social cognitive theory (SCT). Like Reis’ theory of intimacy, SCT holds that behavior is determined in part by outcome expectations—individuals are less likely to engage in behaviors that they believe will have negative consequences (Bandura, 1986). Its broader focus suggests that anticipated reactions from individuals other than the sexual partner may also be important. Thus, an individual’s belief about how his/her friends would react to learning that he/she engaged in sex without disclosure may also play a role in behavior. Conversely, individuals with strong social support may feel better able to handle adverse post-disclosure consequences from sex partners, because they expect their friends to be supportive, and thus fear rejection less. Variables that influence expected consequences or the perception of these consequences should also be important. One such variable that has received considerable attention in the literature on sexual risk behavior is “alcohol myopia.” According to this theory, substance use leads to a given behavior because the restriction in cognition while inebriated amplifies immediate positive behavior cues, such as the prospect of sexual intercourse with an attractive partner, at the expense of longer term and more probabilistic negative cues, such as partner reactions should he/she become infected with HIV (George & Stoner, 2000). Therefore, people who use alcohol and other drugs may be less likely to perceive the potential long-term negative consequences of sex without disclosing their HIV-positive status.

Social Cognitive Theory holds that health behavior is also affected by internal standards. Those HIV-positive individuals who report high self-efficacy to disclose their positive status should be less likely to have sex without disclosure. High self-efficacy has previously been identified in the literature as a predictor of disclosure (Kalichman & Nachimson, 1999). A second source of internal standards, according to SCT, is perceived norms. Individuals who believe that most people with HIV disclose to their sex partners should be more likely to disclose themselves.

For some, disclosure of HIV-positive status is also a legal issue. Twenty-four state legislatures have passed felony non-disclosure statutes. The specifics of these vary, but they all involve the threat of legal punishment to HIV-positive individuals who have sex with someone without first informing them of their serostatus (Lazzarini, Bray, & Burris, 2002). Individuals who live in states with HIV-specific legal statutes prohibiting sex without disclosure may disclose at higher rates than those in other states.

In summary, the variable light in which the issue of positive serostatus disclosure, and consequently the issue of having sex without such disclosure, can be viewed suggests many complex predictors, some unique to a given perspective (e.g., perceived responsibility), and others that fit within multiple theories (e.g., negative partner reactions). We include a wide array of them here not to test between theoretical views, but to explore a model that benefits from multiple viewpoints and that may be applicable to diverse subgroups living with HIV. To account for this diversity, we also include a number of demographic and clinical factors among our candidate predictors. For example, clinical stage of HIV progression may influence disclosure to sex partners (Kalichman, 1995).

This analysis examines the relationship between any sex without disclosure and a broad set of theoretically and empirically driven predictors. We do not assess the degree of HIV transmission risk involved. We examine data at both the individual and partnership levels, and describe the first assessment of potential correlates of sex without disclosure of positive serostatus using a nationally representative sample of HIV-positive adults.

Methods

Participants

This study utilizes data from the 1998 Risk and Prevention survey, within the ongoing HIV cost and services utilization study (HCSUS). The HIV cost and services utilization study cohort consists of 2,864 patients, who were seen in early 1996 by a non-military, non-prison health care provider outside an emergency room within the continental United States. Complete details on the design of HC-SUS have been published previously (Frankel, et al., 1999; Shapiro et al., 1999). The Risk and Prevention sample was randomly drawn from participants in the second follow-up HCSUS interview wave, after stratifying for primary HCSUS sampling unit, type of healthcare provider, age, ethnicity, and sexual orientation. Only English-speaking patients were eligible, resulting in the exclusion of 15% (weighted) of Hispanic participants in the HCSUS second follow-up (unweighted $n = 53$). An additional nine cases were ineligible because self-reported and interviewer observed gender were inconsistent at HCSUS baseline. Eligible white gay men aged 40 and over were sampled with probability one-third, eligible white gay men aged 39 and younger were sampled with probability 4/9, and all other groups were sampled with a probability of one (Ciccarone et al., 2003). The sample was weighted to represent the population of English-speaking HIV-positive adults receiving medical care in the United States in 1996 who survived for at least 2 years. The weights took into account differential selection probabilities across subgroups of the population, non-response, and the fact that some patients had more than one opportunity to enter the sample. The weighting strategy is described in detail elsewhere (Duan et al., 1999). The Risk and Prevention survey

had a response rate of 84% after an adjustment for known mortality. The final size of the overall sample was 1,421 respondents (Ciccarone et al., 2003).

Measures

The Risk and Prevention survey included questions on sexual behavior, disclosure of HIV status, and attitudes and beliefs related to HIV transmission risk behaviors. Data were collected at the individual respondent level and on specific sexual partnerships. Interviewers used laptop computers for data entry, but survey participants entered responses themselves for the sections on sexual behavior.

Data collection on sexual partnerships

Sex was defined as oral, vaginal, and/or anal sexual activity and was measured for up to six partnerships. Participants who did not report any sexual activity within the last 6 months were excluded from the analysis ($n = 488$). Respondents who reported sexual activity were asked a series of questions about their most recent sexual encounter. Respondents were asked to indicate the number of different sex partners they had in the prior 6 months, and those individuals who had multiple partners during the 6-month period were then asked about disclosure and partner characteristics for each successively less recent partner, until they had described all their partners during this period or had described their five most recent partners. Individuals who had a spouse or primary relationship partner not included among the five most recent partners were asked separate questions about that person, resulting in six partners for these respondents.

Definition of sex without disclosure

The dependent variable was having any sex without disclosure of HIV-positive status over the previous 6 months, which was defined at both the respondent and partnership level. The respondent level variable was coded “1” if the respondent had any sex without disclosure with any partner, and “0” if, with all partners in the 6-month period, the respondent only had sex after disclosure. The respondent indicator was derived from the partnership level variable. The latter was created from three survey items asked separately and about each partnership; whether the respondent “ever actually told (partner) that he/she has HIV,” the date of disclosure, and the date of first sex with that partner. Thus, the dependent variable did not include methods of “implied” disclosure such as leaving pill bottles in clear view or talking about membership in an HIV-positive support group. Although we collected information on safer sex behaviors, we cannot determine, for those who engaged in both safe and unsafe activity during the reference period, on which dates this occurred. Thus, we cannot map sexual safety to dates of sex without disclosure, and are unable to assess the association between sex without disclosure and transmission risk behaviors.

Potential correlates

A complete list of variables examined is provided in Tables 1 and 2. Although we classify each in one of the four perspectives outlined in the introduction, we reiterate here that some variables would fit under multiple headings. We show them only once to simplify our presentation. Variables for the analysis included respondent characteristics and characteristics of each partnership, as reported by respondents within the Risk and Prevention survey. The survey included the following demographic variables: age, risk group/sexual orientation (woman, heterosexual man, gay or bisexual man/GBM), race/ethnicity (white, African American, Latino, other), income and level of education. Clinical variables included lowest CD4 count and highly active anti-retroviral therapy (HAART) use in the past 6 months.

Respondent-level variables assessing personal responsibility included the perceived responsibility to disclose to all partners, measured with a single item 5-point Likert scale, and a 3-item scale measuring the perceived responsibility to disclose to at-risk or concerned partners “only if he/she plans to have unprotected anal or vaginal sex,” “only if the partner asks about his/her HIV status,” and/or “if he/she thinks the new partner is HIV-negative,” (Cronbach’s $\alpha = 0.69$). Negative partner reactions was measured with a 6-item scale (Cronbach’s $\alpha = 0.85$) measuring the likelihood on a 5-point Likert response scale (“definitely would happen” to “definitely would not happen”) that if the respondent disclosed HIV positivity to a sex partner, the partner would “end the relationship,” “refuse to have sex with you,” “tell other people you’re HIV-positive,” or “get angry,” and that disclosure would “bring you and your partner closer” (reverse scored) or “make the partner very uneasy about having sex.” Degree of religiosity measured both importance of religion and the seeking of comfort through religion (three items, Cronbach’s $\alpha = 0.76$).

Respondent-level health behavior variables were based in SCT. They assessed outcome expectancies with a scale measuring expected negative partner reactions to disclosure, (six items, Cronbach’s $\alpha = 0.85$), with the belief that contracting HIV is “less serious” given the availability of HAART measured with a single item 4-point Likert scale, with optimism about HAART decreasing the risk of HIV transmission measured with a scale created from the mean of two survey items (Cronbach’s $\alpha = 0.78$), and with perceived friend reaction to non-disclosure measured with a single item 4-point Likert scale. Respondent-level variables measuring alcohol use, the use of illicit drugs other than marijuana within the past year, and the level of perceived social support were drawn from the second follow-up HCSUS survey, because they were not collected as part of the Risk and Prevention survey. These variables were expected to indirectly assess outcome expectancies regarding sex without disclosure, because they may affect perceptions of these outcomes.

Self-efficacy was measured with a single item 5-point Likert scale, and a scale for perceived behavioral norms regarding disclosure was created from the mean of two survey items (Cronbach’s $\alpha = 0.48$).

Variables related to relationship processes were measured at the partnership level. They included partnership type (spouse/primary relationship partner, primary sex partner, occasional partner, one-time partner) and duration of partnership in years. Relationship variables measuring power differentials included age differences between respondent and partner (respondent older, respondent younger, same age), with age classified in blocks of 5 years (i.e., 20–24 years, 25–29 years, etc). Partnerships in which the age of both individuals fell within the same block were “same age” partnerships, but an age differential was present if the respondent was in an older or younger block than the partner. Other partnership-level variables assessing a power imbalance included commercial sex, measured by either individual exchanging sex for money or goods, and the presence of any abuse within a partnership. To examine the role of legal issues, we included an indicator of any felony non-disclosure laws in the respondent’s state of residence.

Data analyses

The dataset initially contained 933 sexually active respondents and their 1,749 sexual partnerships. Participants who refused to answer the question on disclosure, reported that they did not know either the date of disclosure or the date of first sex, or were otherwise missing information on whether or not they disclosed were classified as missing ($n = 52$), thereby reducing the analytic sample to 881 respondents. An additional six individuals reported sexual orientation as “other” and we excluded them from analysis due to the small cell size this would create. A hot-deck imputation strategy (Brick & Kalton, 1996) within risk group was used for

other variables with missing data, resulting in a final analysis sample of 875 respondents and their 1,647 partnerships.

Descriptive statistics were generated for all variables, and Pearson correlation coefficients were calculated to exclude significant collinearity in the multivariate analyses. Bivariate analyses were performed between respondent-level variables and disclosure status as well as between partnership-level variables and disclosure within the partnership. Chi-square tests were used for discrete variables and simple linear regression was used for continuous variables. A logistic regression model at the partnership level was then constructed with weighted data, using correlates with a significance threshold of $p < 0.2$ in the bivariate analyses, along with other theoretically central variables. Both respondent-level and partnership-level information were included in this multivariate model. The model accounted for the correlation among the partners of each respondent by fitting generalized estimating equations (GEE) with exchangeable correlation structures (Liang & Zeger, 1986). The resulting model-based variance estimates of the logistic regression parameters are adjusted for the complex survey design using linearization (Binder, 1983). A two-tailed $p < 0.05$ was the threshold for statistical significance in both the bivariate and multivariate analyses.

Results

Of the 875 sexually active respondents in the analysis sample, a weighted 48% were GBM, 34% women and 18% heterosexual men. Thirty-seven percent of the sampled population were African American, 17% Latino, and 43% white. Forty-four percent were aged 40 years or older, and 55 percent had never attended college. Seventy-three percent had an annual income in 1998 of less than \$25,000.

Among the 1,647 sexual partners, 41% were either spouses or primary relationship partners, 6% were primary sex partners, 25% occasional partners and 27% partners with whom respondents had one-time encounters. Sixty-seven percent of relationships were less than 3 years in duration, 18% had lasted between 3 and 5 years and 14% had lasted more than 5 years. About forty percent of partnerships were between individuals of the same age group. Among partnerships of all sexually active respondents, 41% involved sex without HIV disclosure.

Correlates of sex without disclosure

Bivariate analyses at the respondent level (Table 1) showed that gender/sexual orientation and level of education were significant correlates of sex without disclosure while other demographic variables were not. Neither of the clinical indicators of health status was significant.

Variables measuring personal responsibility, including religiosity and the responsibility to disclose HIV-positive serostatus, were significant correlates of sex without disclosure. Several health behavior measures related to outcome expectancies, including expected negative reactions from both sex partner and friends, perceived social support, the belief that HAART makes HIV transmission less likely, and the belief that HAART makes HIV less serious were also associated with sex without disclosure. Drug use, but not alcohol use, was associated with greater odds of sex without disclosure. No association with potential legal repercussions was evident, as no difference was found in the percentages engaging in sex without disclosure among residents of states in which sex without disclosure is a felony and residents of states in which it is not. All of the partner-level correlates were significant at the bivariate level (Table 2). This included measures of relationship processes such as type and length of partnership and knowledge of partner HIV status (whether positive or negative), as well as measures of power imbalance such as abuse within the partnership, commercial sex by either the respondent or the partner, and the presence of an age differential within the partnership.

Within the multivariate model combining both individual-level and partnership-level variables (Table 3), greater perceived responsibility to disclose to all partners was associated with a lower probability of sex without disclosure, $OR = 0.69, p < 0.01$, when compared with the absence of this belief. However, no association was seen between sex without disclosure and other variables measuring personal responsibility, specifically the conditional responsibility to disclose to at-risk or concerned partners or religiosity. We found a significant association between several measures of relationship intimacy and disclosure. Occasional sexual partnerships, $OR = 2.34, p < 0.01$, and one-time sexual encounters, $OR = 3.61, p < 0.01$, were more likely to involve sex without disclosure than marriages and/or primary relationships. Primary sexual partnerships were not significantly different from marriages and/or primary relationships. Independent of relationship type, longer partnerships were less likely to involve sex without disclosure, $OR = 0.92, p < 0.01$. People who knew their partners were either HIV positive, $OR = 0.09, p < 0.01$, or HIV negative, $OR = 0.15, p < 0.01$, were less likely to have sex without disclosure within the partnership than those people with partners of unknown HIV status. Measures of power differentials, including respondent age relative to the partner, commercial sex, or abuse within the partnership, were not associated with sex without disclosure. Women were less likely to have sex without disclosure than GBM, while no difference was observed between heterosexual men and GBM.

Within the multivariate analysis, drug use was correlated with lower odds of sex without disclosure, an association in the opposite direction from the bivariate results. To examine this finding in more detail, we performed multiple sensitivity analyses, each excluding a different partnership level variable. When partnership types, and subsequently partnership length, were excluded, the association between drug use and sex without disclosure was not observed. We found no association between sex without disclosure and the other SCT/health behavior measures that had been bivariate predictors (negative partner reactions, variables measuring how negative consequences may be perceived, and self-efficacy to disclose).

Discussion

This study is the first analysis of correlates of sex without HIV disclosure in a large, national probability sample, and adds several key findings to the literature. While two earlier studies of HIV-positive men within selected populations identified the association between perceived responsibility to disclose and less sex without disclosure, we confirmed these findings within a larger, probability sample. Also, we assessed sex without disclosure at the partnership level, which permitted analysis of partnership-specific characteristics as correlates of sex without disclosure and allowed for variability in behavior within individual respondents. Finally, we report the first results showing the lack of association between felony non-disclosure laws as presently enacted and enforced and rates of sex without disclosure, a finding with important policy implications.

Perceived responsibility to disclose has been reported recently as a key factor relating to disclosure to sexual partners within convenience samples of men enrolled in HIV clinical trials (Serovich & Mosack, 2003), and men actively seeking treatment for sexually transmitted infections (Gorbach et al., 2004). However, generalizability of such results to the broader population with HIV was questionable. Examining a broad national sample of both men and women, we identify in our study an association between a perceived responsibility to disclose to every partner and lower rates of sex without disclosure. Prior work found that perceived responsibility was more closely related to disclosure than the fear of post-disclosure consequences (Serovich & Mosack, 2003) and the absence of associations between outcome expectancies and sex without disclosure in our results is consistent with those observations.

Personal responsibility has also been shown to correlate with safer sex behaviors, as HIV-positive GBM with higher levels of personal responsibility are less likely to engage in unprotected anal sex with uninfected partners than those with lower levels of personal responsibility (Wolitski et al., 2003). The linking of disclosure and safer sex with a strong sense of individual responsibility may help inform the design of “prevention for positives” programs targeting those already infected. Most existing prevention programs (designed for seronegative individuals) are currently based on Social Cognitive Theory or similar theoretical models. To the extent that prosocial motivations, particularly perceived responsibility, are modifiable, identifying and including within such programs strategies to instill and nurture the idea of responsibility to others might reduce rates of sex without disclosure of HIV-positive status. Further research in population-based samples examining the correlation between perceived responsibility and unprotected sex might improve the overall prevention impact of these programs.

While relationship intimacy and knowledge of partner’s serostatus have been previously reported in the literature as correlates of sex without disclosure, prior studies have used relationship indicators measured at the level of the respondent, resulting in confounding between characteristics of individuals within relationships with varying degrees of intimacy and characteristics specific to the relationships. In contrast, we examined these characteristics in analyses conducted at the partner level. The constructs of relationship type, relationship length, and knowledge of partner serostatus, were all related to the degree of intimacy within relationships and were each significant within the multivariate analysis, indicating that each has an independent association with sex without disclosure. Our findings are the first to suggest that relationship characteristics, independent of respondent characteristics, correlate with disclosure of positive HIV serostatus to sex partners.

Although this study did not demonstrate an expected association between disclosure and power differentials within partnerships, such as situations of abuse within relationships, such associations cannot be excluded. Some previous studies have shown that women with HIV are at increased risk for violence and that fear of such violence at the hands of sexual partners may inhibit disclosure (Gielen et al., 1997; Gielen, O’Campo, Faden, & Eke, 2000). It is possible that those in violent partnerships are less likely to disclose out of fear of retaliation, but others who disclose to previously non-violent partners become victims as a result. If so, this could explain our failure to observe any significant associations in data that do not indicate the relative timing of disclosure and abuse.

Examining the issue of potential legal ramifications and sex without disclosure, we found no association between sex without disclosure and felony non-disclosure statutes, although we did not measure knowledge of such laws in this study. People may be unfamiliar with their existence, as reports indicate that fewer than 100 cases have been prosecuted using HIV-specific statutes since 1986 (Lazzarini et al., 2002). The actual number of prosecutions is difficult to ascertain due to the lack of a central tracking system, prosecutorial discretion in some sensitive cases, and plea-bargains before many cases reach trial. The specific content of HIV-related statutes varies between states (Anonymous in 2004). For example, California requires proof of intent to infect another in order to prosecute, while most other states do not. Nevertheless, our findings indicate that these laws as presently enacted and enforced are not associated with lower rates of sex without disclosure. Knowledge of laws does not necessarily lead to compliance with them, particularly in the case of those that regulate private and personal behaviors. Further research examining individual knowledge of felony non-disclosure laws among those living with HIV may provide more detailed information about the associations of such laws with sexual behavior.

The finding of increased disclosure rates for women confirms a similar but non-significant trend in a previous analysis limited by a smaller sample size (Stein et al., 1998). Prior work has indicated women to be more inclined than men to disclose intimate information that may be perceived negatively, which could explain the greater likelihood of HIV-positive women informing their partners prior to sex (Shaffer, Pegalis, & Bazzini, 1996).

None of the health behavior/SCT variables were predictors of disclosure. This study is limited in that we could not relate disclosure to risk behavior, i.e., we do not know whether sex that occurred before disclosure was more or less likely to involve condom use than sex that occurred after disclosure, nor can we determine whether sex without disclosure was unprotected sex. It may be for this reason that we found no relationships between having any sex without disclosure and SCT variables. Other studies designed to examine this important issue will add to our understanding of the role of disclosure in HIV prevention, and the level of infection risk that is faced in instances of non-disclosure. It is possible that sex without disclosure is better predicted by theories of health behavior when it is defined in relation to protected versus unprotected sex. Another limitation is the restriction of the sampling frame to include only English-speaking HIV-positive individuals who were in medical care for at least two and a half years. This analysis therefore underrepresented Latinos and non-English speaking immigrants with HIV, others with poor access to care and individuals with less severe disease than the overall population of diagnosed seropositive persons. In addition, all data obtained in the study were self-reported. However, this project used computer-assisted survey technology that has been shown to increase the frequency of reporting socially undesirable behaviors, a category in which sex without disclosure probably falls (Turner et al., 1998). We were also unable to compare rates of oral sex without disclosure to rates of vaginal or anal sex without disclosure. Finally, we were unable, due to limitations in sample size, to examine whether our findings vary among the major subgroups making up the population living with HIV. The circumstances and beliefs related to disclosure or lack of disclosure may be different for gay and bisexual men, heterosexual men, and women (Ciccarone et al., 2003), or for those in a steady relationship versus casual relationships.

By employing a representative sample of patients with HIV, this analysis provides information on correlates of sex without disclosure that can be generalized to a wide range of settings within the United States, and suggests important directions for future research. Our study is cross-sectional, however, and caution is warranted in making causal interpretations of the findings. Future longitudinal studies, including qualitative work examining issues such as perceived responsibility before HIV disclosure occurs (or fails to occur), will provide further insight in this area.

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Table 1Bivariate relationships between respondent characteristics and sex without disclosure (respondent level, $n = 875$)

Categorical variables	N	% of subgroup not disclosing to every partner	F-statistic
Gender/Sexual orientation			21.46**
Men having sex with men	419	60	
Heterosexual men	157	34	
Women	299	27	
Race/Ethnicity			0.71
African American	326	44	
Latino	146	44	
White, non-Hispanic	375	51	
Other	28	57	
Age			0.44
20–29	89	46	
30–34	165	48	
35–39	236	52	
40–44	181	45	
>45	204	46	
Education			7.97**
Some high school	221	32	
Graduated high school	263	44	
Some college	244	57	
Graduated college	147	58	
Income			0.89
<5,000	164	53	
5,000–10,000	235	45	
10,000–25,000	244	44	
>25,000	232	52	
Lowest reported CD4 count			1.17
>500	49	62	
200–499	361	47	
50–199	283	46	
0–49	182	49	
Clinical Stage			0.76
Asymptomatic with HIV	24	37	
Symptomatic with HIV	487	46	
AIDS diagnosis	364	51	
Perceived responsibility to disclose to all partners			64.27**
Yes	496	32	
No	379	66	
Perceived friend reaction to non-disclosure			42.58**
Friends would disapprove	610	37	
Friends would not disapprove	265	70	
Use of HAART in last six months			1.48
Yes	504	46	
No	371	50	
HAART-related optimism regarding transmission risk			3.83
Yes	544	51	
No	331	43	
Belief that HAART means HIV infection is “less serious”			4.30*
Agree	190	56	
Disagree	344	51	
Strongly disagree	341	41	
Self-efficacy to disclose			4.11*
High	504	44	
Low	371	53	
Drug Use			7.11**
No drug use in past year	641	44	
Some drug use in past year	234	58	
Alcohol Use			2.29
None	398	41	
Moderate drinker	331	54	
Binge drinker	146	50	
Non-disclosure is a felony crime under state law			0.24
Yes	534	49	
No	341	46	
Continuous variables		Odds ratio for sex without disclosure	t-statistic
Perceived responsibility to disclose to at-risk or concerned partners		0.66**	–
Perceived disclosure norms		0.71**	– 3.89

Categorical variables	<i>N</i>	% of subgroup not disclosing to every partner	F-statistic
Negative partner reactions		0.76 [*]	– 2.12
Perceived social support		0.79 ^{**}	– 3.96
Religiosity		0.85 ^{**}	– 3.27

* Indicates $p < 0.05$.

** Indicates $p < 0.01$.

Table 2Bivariate relationships between partnership characteristics and sex without disclosure (partnership level, $n = 1647$)

Categorical variables	<i>N</i>	% of partnerships without disclosure	F-statistic
Type of partnership			51.82**
Spouse	150	12	
Primary relationship partner	528	20	
Primary sex partner	100	33	
Occasional sex partner	413	57	
One-time sex partner	456	75	
Age differential within partnership			4.64**
Same age	667	42	
Respondent older	696	48	
Respondent younger	284	30	
HIV status of partner			125.28**
Partner unknown	677	81	
Partner positive	429	22	
Partner negative	541	23	
Respondent provides sex for money or goods			10.46**
Yes	45	69	
No	1602	43	
Partner provides sex for money or goods			6.28*
Yes	65	66	
No	1582	42	
Respondent a victim of abuse within partnership			11.52**
No	1456	45	
Yes	55	24	
Unknown	136	26	
Continuous variable		Odds ratio for sex without disclosure	<i>t</i> -statistic
Length of partnership in years		0.77**	− 6.02

* Indicates $p < 0.05$.** Indicates $p < 0.01$.

Table 3
Multivariate logistic regression analyses for sex without disclosure (partnership level, $n = 1647$)

Respondent-level variables	Adjusted odds ratio for sex without disclosure	95% CI
Demographics		
Risk group/Sexual orientation		
MSM (reference)	1.0	
Heterosexual men	0.94	0.48, 1.85
Women	0.49	0.29, 0.85**
Age	0.99	0.96, 1.01
Race/Ethnicity		
White, non-Hispanic (reference)	1.0	
African American	0.97	0.62, 1.52
Other	1.11	0.43, 2.90
Latino	1.80	0.93, 3.50
Education		
Less than HS (reference)	1.0	
HS graduate	1.26	0.74, 2.17
Some college	1.69	0.99, 2.88
College graduate	1.44	0.68, 3.05
Substance use		
Drug use by respondent		
No (reference)	1.0	
Yes	0.66	0.45, 0.98*
Alcohol use by respondent		
Non-drinker (reference)	1.0	
Moderate drinker	0.86	0.57, 1.28
Binge drinker	0.88	0.50, 1.54
Health status		
Clinical stage		
Asymptomatic (reference)	1.0	
Symptomatic	1.22	0.50, 2.98
AIDS	1.76	0.70, 4.38
Prosocial characteristics		
Perceived responsibility to disclose to all partners		
No (reference)	1.0	
Yes	0.69	0.56, 0.85**
Perceived responsibility to disclose to at-risk or concerned partners	0.69	0.47, 1.02
Religiosity	0.97	0.91, 1.03
Social cognitive theory/constructs		
Negative partner reactions	0.92	0.69, 1.23
Perceived friend reaction to non-disclosure		
Friends would disapprove (reference)	1.0	
Friends would not disapprove	1.22	0.74, 2.01
Perceived disclosure norms	0.91	0.74, 1.12
Use of HAART in last six months		
No (reference)	1.0	
Yes	0.81	0.56, 1.19
HAART-related optimism regarding transmission risk		
No (reference)	1.0	
Yes	0.91	0.64, 1.30
Belief that HAART means HIV infection is "less serious"		
Strongly agree/agree (reference)	1.0	
Disagree	0.70	0.42, 1.16
Strongly disagree	0.73	0.42, 1.29
Perceived social support	1.02	0.87, 1.19
Self-efficacy to disclose		
Low (reference)	1.0	
High	0.95	0.60, 1.48
Non-disclosure laws		
Non-disclosure is a felony crime under state law		
No (reference)	1.0	
Yes	1.00	0.63, 1.58
Type of Partnership		
Spouse/exclusive partner (reference)	1.0	
Primary sex partner	1.60	0.75, 3.39
Occasional sex partner	2.34	1.27, 4.32**
One-time sex partner	3.61	2.27, 5.74**
Length of Partnership (years)	0.92	0.89, 0.96**
HIV status of partner		
Partner unknown (reference)	1.0	
Partner positive	0.09	0.06, 0.13**

Respondent-level variables	Adjusted odds ratio for sex without disclosure	95% CI
Partner negative	0.15	0.09, 0.25**
Age differential within partnership		
Same age (reference)	1.0	
Respondent younger	0.61	0.36, 1.02
Respondent older	0.92	0.69, 1.22
Commercial sex		
None (reference)	1.0	
Respondent provides sex for money and/or goods	0.97	0.43, 2.19
Partner provides sex for money and/or goods	1.21	0.50, 2.91
Respondent a victim of abuse within partnership		
No (reference)	1.0	
Yes	1.26	0.55, 2.88
Unknown	1.34	0.89, 2.03

* Indicates $p < 0.05$.

** Indicates $p < 0.01$.