Review

Secrets and Safety in the Age of AIDS: Does HIV Disclosure Lead to Safer Sex?

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To fuel the HIV/AIDS epidemic, HIV-seropositive individuals must interact unsafely with HIV-seronegative individuals. Research indicates that up to one third of individuals diagnosed with HIV infection continue to have unprotected sex, at times without informing their sexual partners, who may be of negative or unknown serostatus.[1-3] Some research and public health interventions have focused on encouraging HIV-seropositive individuals to reveal their serostatus to their partners, predicated upon the assumption that disclosure will increase the safety of subsequent sexual activity with informed partners. This review examines the empirical literature on disclosure of HIV serostatus and subsequent sexual risk behaviors of HIV-infected individuals. Only 15 of the 23 studies reviewed provided data that allowed us to examine the association between disclosure and safer sex. Fewer still provided a methodologically sound analysis, and those that did provided conflicting results, often with significant effects limited to only 1 subgroup of participants. However, this failure to demonstrate a consistent association does not necessarily mean that disclosure is irrelevant to the practice of safer sex. The limitations of the research to date and implications for policy and practice are discussed.

"It is difficult to identify a more charged issue in AIDS prevention than that of nondisclosure of positive HIV status to sexual partners." [4(p 949)]

Introduction

The annual number of new HIV infections in the United States has remained consistent, at approximately 40,000 per year, for more than 10 years, and the incidence of new infections among men who have sex with men (MSM) has begun to rise for the first time in as many years. The US Centers for Disease Control and Prevention (CDC) estimates that 77% of men and women with HIV/AIDS through 2002 were infected through sexual contact; thus, interventions aimed at reducing risky sexual behaviors have played and will continue to play an integral role in HIV prevention efforts.[5]

To fuel the epidemic, HIV-seropositive individuals must interact unsafely with HIV-seronegative individuals. In fact, research indicates that up to one third of individuals diagnosed with HIV infection continue to have unprotected sex, at times without informing partners, who may be of negative or unknown serostatus.[1-3] Nondisclosure in such instances may involve active deception, not merely passive omission.[6]

In response to reports of increasing numbers of new infections, many public health officials are shifting their HIV prevention efforts from populations at risk for HIV infection to those individuals who are already infected. Notably, the CDC in 2000 initiated an innovative Serostatus Approach to Fighting the Epidemic (Project SAFE)[7] and expanded these efforts in 2003 with the initiative "Advancing HIV Prevention: New Strategies for a Changing Epidemic."[8] The CDC and the public health establishment hope to slow the spread of the epidemic by, among other approaches, making HIV prevention a part of routine medical care, targeting individuals who are already infected, developing interventions to increase rapid testing, facilitating and expediting access to treatment, and decreasing transmission risk behaviors of HIV-seropositive individuals. A major component of preventive efforts directed at HIV-infected individuals involves encouraging them to disclose their HIV serostatus to their sexual partners.

Indeed, since 1988, the US Public Health Service has been recommending that all persons with HIV notify their sexual partners of their serostatus, and since 1987, the CDC has been mandating discussions of disclosure to partners in posttest counseling.[9] Furthermore, a coalition of public and professional organizations representing a variety of health care providers has recently come forward to advocate for brief HIV prevention interventions in the context of routine medical care, including discussing safer sex practices with HIV-infected patients and encouraging them to disclose their HIV serostatus to all sexual partners.[10]

Underlying the attempt to encourage HIV-seropositive individuals to reveal their serostatus to their sexual partners is the assumption that disclosure will increase the safety of subsequent sexual activity with informed partners. As Norman et al remarked, "... it is reasonable to assume that a couple's diligence in using condoms consistently and correctly would be enhanced by one partner's disclosure of positive serostatus."[11(p341)] Miller and colleagues concurred that open communication is likely to facilitate safer sexual practices.[12] Indeed, dis-

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closure may facilitate the discussion of safe sexual activities or the negotiation of protection to prevent HIV. Moreover, it may increase the motivation of the informed partners to use protection, especially if they are uninfected.

Barriers to HIV Status Disclosure

However, significant disincentives and barriers to revealing one's HIV diagnosis persist.[4] These include fears of rejection and abandonment, discriminating treatment such as eviction or termination of employment, retribution, violence, and other forms of abuse. Most of these possible outcomes are based on the social stigma that is widely acknowledged to be associated with an HIV diagnosis.[13] Additionally, divulging that one is HIV-infected may expose other stigmatized behaviors or identities (eg, that one is gay or an injection drug user).[14] Disempowered individuals may be particularly reluctant to risk these adverse reactions.

There is another impetus to remain silent about one's HIV serostatus. State legislatures and prosecutors emphasized from early in the epidemic that HIV-infected individuals who are sexually active may be liable to prosecution under assault, reckless endangerment, and attempted murder statutes. Particular cases and statutes now address exposure (whether or not condoms were involved) and not just infection.[15] As of 1999, 31 states had statutes making sexual contact without disclosure a criminal offense.[16] Also, in many states, health professionals are now mandated to report to the appropriate authorities HIV-seropositive individuals who have unprotected sex without informing their partners of their HIV infection.[17] Civil liberty lawyers contend that these statutes may actually hamper disclosure by opening up the possibility of later arrest.

These psychosocial, practical, and legal barriers may contribute to the refusal of many individuals with HIV to divulge their serostatus to sexual partners. According to early studies before the advent of antiretroviral therapy, primarily of MSM on the West Coast, nondisclosure to sexual partners ranged from 2% to 52%, with disclosure generally more frequent to steady partners than to casual partners.[18] In later studies in populations with more diverse samples, nondisclosure to sexual partners ranged from 13% to 41%.[18]

HIV Status Disclosure and Sexual Safety

Even when individuals surmount the barriers to disclosure and reveal their serostatus to sexual partners, there is no guarantee of their subsequent sexual safety. As Serovich and Mosach[19] cautioned, disclosure does not mean individuals will use the information to protect themselves or others; in fact, some will knowingly place themselves at risk for infection. "Thus, it is erroneous to assume that disclosure would lead to safer behaviors or a lowering of risk," they concluded.[19(p78)] Marks and Crepaz expressed a similar viewpoint, explaining that some HIV-infected individuals may disclose their serostatus but then eschew protection (what they termed "informed exposure"), possibly to attest to their commitment to the relationship or because of the effects of substance use prior to sexual activity.[20] Others engage in informed exposure because their partners made the final decision to forgo protection. In the extreme, a subset of the MSM community seeks out opportunities for "barebacking," or the intentional participation in unprotected anal intercourse.[21]

Similarly, nondisclosure does not necessarily lead to unsafe sex. Some HIV-infected individuals may refrain from divulging their HIV serostatus to protect their privacy and avoid the negative consequences of disclosure, such as stigma or rejection. However, they may engage in protected sexual activity, perhaps out of a sense of personal responsibility toward their partners. Marks and Crepaz labeled this strategy "uninformed protection."[20]

Clearly, disclosure is neither necessary nor sufficient to ensure safer sex; yet is the association between disclosure and subsequent sexual safety strong enough to warrant HIV-prevention policies that place considerable emphasis on disclosure? To address this important question, we reviewed the available empirical literature on the association between HIV disclosure and safer sex. We end with a discussion of the implications of the findings for future research, practice, and policy.

Review of the Literature

Methods

We searched PsychInfo and Medline for articles published through February 2004 that contained various combinations of the terms *HIV/AIDS, infected, infection, positive, seropositive, serostatus, disclosure, self-disclosure, nondisclosure, notification, protected, unprotected, sex, sexual, risk behavior, safer, partner,* and *prevention*. We consulted with experts in the field and inspected the references in the articles we obtained.

Findings

Only recently has there been an increase in studies examining disclosure or sexual practices among HIV-seropositive individuals. Still, very few studies examine both of these constructs among an HIV-infected population, and fewer still collect or report the data in ways that address the relationship between disclosure and safer sex. Table 1 presents the 15 studies we found that considered both disclosure and sexual safety, regardless of whether they were explicitly designed to assess the relationship between these 2 variables.

For each study, when available, we provided information about the sample (ie, number of subjects, basic demographic description, geographic location, and setting and date of recruitment) as well as any descriptive findings related to disclosure of HIV and to sexual safety. If any conclusions could be made about the association between disclosure and sexual safety, whether they were explicitly reported in the article or not, these were included as well. Studies in the table are grouped by the sex composition of their samples: only men, only women, or both men and women.

We located 10 studies of disclosure and sexual safety with only men in their samples. Two of these studies reported no data on the association between disclosure and sexual safety, and these were not included in the table.[11,22] Findings among the remaining 8 studies were mixed, with 4 reporting no significant association.[20,23-25] In both a multiethnic sample of men recruited in Los Angeles[26] and a sample of mostly gay or bisex-

Table **1**. Published Studies Examining HIV Disclosure and Sexual Safety

Citation and Sample	Disclosure to Sexual Partners	Sexual Safety	Association Between Disclosure and Sexual Safety
Men Only (8)			
Crepaz and Marks (2003)[23] 105 HIV+ male outpatients (64% African American) at HIV clinic in Los Angeles, 1996-1997	53% disclosed to most recent HIV- or HIV? partner	28% engaged in unprotected anal or vaginal intercourse with at-risk partner	Disclosure was NOT related to safer sex; however, disclosers who discussed safer sex (vs. those who disclosed only) had a higher prevalence of protected anal or vaginal intercourse
Marks and Crepaz (2001)[20] 206 multiethnic HIV+ men whose most recent partner was HIV- or HIV?, recruited at an outpatient clinic in Los Angeles, 1995-1997	52% disclosed to HIV- or HIV? partner	25% engaged in unprotected anal or vaginal intercourse; unsafe sex was associated with substance use before sex, having an HIV? partner, less emotional involvement with partner, and more recent HIV diagnosis	Unsafe sex not more prevalent among disclosers than nondisclosers; strategies employed were 40% informed protection, 12% informed exposure, 35% uninformed protection, and 13% uninformed exposure
De Rosa and Marks (1998)[26] 255 HIV+ multiethnic men who were sexually active in the last 2 months, recruited at 2 HIV outpatient clinics in Los Angeles, 1992-1993	93% told all their HIV+ partners, 57% told all their HIV- partners, and 23% told all their HIV? partners	Percentage of informed partners with whom all oral, anal, and vaginal sex was protected: 26%; for uninformed partners: 16%	Among HIV- but not HIV+ or HIV? partners: exclusively protected sexual activity occurred with a significantly greater percentage of informed than uninformed partners
Wolitski, Rietmeijer, Goldbaum, and Wilson (1998)[2] 701 mainly white MSM from 4 US cities who recently received their HIV test result, 1987-1991	89% of HIV+ MSM informed primary sex partner; 34% informed nonprimary partner	16% of HIV+ MSM reported inconsistent condom use during anal intercourse with an uninformed nonprimary partner within the last 90 days	With primary partners, HIV+ disclosers and nondisclosers did not differ in sexual practices or condom use; with nonprimary partners, disclosers more likely than nondisclosers to report consistent condom use for insertive anal intercourse
Geary, King, Forsberg, Delaronde, and Parsons (1996)[24] 167 suburban, 77% white HIV+ males (12–25 years old) with hemophilia in US	42% disclosed to their most recent partner	Among disclosers, 64% reported consistent condom use and 81% used a condom during last sexual intercourse; for nondisclosers, 66% and 85%	No significant association between disclosure and condom use
King, Delaronde, Dinoi, and Forsberg (1996)[25] 306 HIV+ mostly white adolescent males with hemophilia, recruited at 11 hemophilia treatment centers, 1992	30% of individuals who used alcohol or other drugs (AOD) as a coping strategy for their diagnosis disclosed to all partners, 55% non-AOD copers	68% reported using condoms every time for sex	No difference in disclosure was found between those who used condoms every time for sex and those who were less consistent
Marks, Ruiz, Richardson, et al (1994)[1] 609 HIV+ multiethnic men recruited at 2 HIV outpatient clinics in Los Angeles, 1991-1992	86% disclosed to HIV+ anal sex partners, 46% HIV-, 18% HIV?	9% engaged in unprotected insertive anal intercourse in the past 2 months (3.27 times more likely with HIV+ than HIV- or HIV? partners)	HIV+ respondents had unprotected insertive anal sex with 18% of HIV- partners who were informed and with 23% of HIV- partners who were not informed (26% and 28%, receptive)
Marks, Richardson, and Maldonado (1991)[27] 138 HIV+ mainly Hispanic sexually active men, mostly gay or bisexual, recruited at a public HIV outpatient clinic in Los Angeles	48% of sexually active men disclosed to all partners; disclosure more common to HIV+ than HIV- partners	17% engaged in unprotected insertive anal intercourse with HIV- partners without disclosure (29%, receptive)	Disclosure to HIV+ partners generally occurred in combination with unprotected contact, whereas disclosure to HIV- partners generally occurred in combination with protected contact

HIV+ indicates HIV-seropositive; HIV-, HIV-seronegative; HIV?, HIV serostatus unknown.

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Table **1**. Published Studies Examining HIV Disclosure and Sexual Safety, continued

Citation and Sample	Disclosure to Sexual Partners	Sexual Safety	Association Between Disclosure and Sexual Safety
Women Only (1)			
Sturdevant, Belzer, Weissman, et al (2001)[31] 153 HIV+ and 90 HIV- sexually active adolescent girls (73% African American) from 13 US cities	Among HIV+ girls, disclosure related to perception partner was HIV+	59% of HIV+ and 80% of HIV- girls reported oral, anal, or vaginal sex without condom in past 3 months; among HIV+ girls, non-use of condoms was associated with older partner age, greater partner age difference, partner being HIV+, and longer duration of partnership	Among HIV+ girls, without disclosure (vs. with disclosure) less condom use was reported, after controlling for perception that partner was HIV+
Both Men and Women (6)			
Kalichman, Rompa, Luke, and Austin (2002)[34] 269 HIV+ men and 114 HIV+ women (71% African American) from HIV agencies and clinics in Milwaukee, WI	78% of those with a regular partner had disclosed; 54% for nonregular partner	71% of the 257 who engaged in vaginal or anal intercourse in the last 3 months did so with serodiscordant partners	Percentage of protected intercourse with regular and nonregular serodiscordant partners (68-77%) was similar regardless of whether disclosure had occurred
D'Angelo, Abdalian, Sarr, Hoffman, and Belzer (2001)[36] 203 HIV+ male and female adolescents who were part of an ongoing national multisite study	48% of 242 partners were informed; disclosure was more likely to HIV+ (vs. HIV?) and main (vs. casual) partners		Disclosers reported a mean of 14 unprotected sexual encounters (time frame not reported), 41% had HIV- partner(s); non-disclosers reported a mean of 10 unprotected sexual encounters, 67% had HIV- partner(s)
Kalichman and Nachimson (1999)[14] 165 HIV+ men and 101 HIV+ women sexually active in last 6 months (67% African American) from HIV agencies and clinics around Atlanta	59% had disclosed to at least 1 sex partner in the last 6 months; 78% of men and 79% of women had disclosed to last partner	77% of male and 89% of female nondisclosers had HIV- or HIV? partners in last 6 months	Among men but not women, disclosers reported higher rates of condom use (especially during anal intercourse) than nondisclosers
Niccolai, Dorst, Myers, and Kissinger (1999)[35] 147 male and female HIV+ outpatients (88% African-American) participating in a risk reduction/partner notification intervention trial in New Orleans, LA, 1994-1998	76% informed (actively or passively) their last partner	76% reported consistent condom use; 85% reported using condoms the last time they had sex; 81% reported having only 1 partner in the previous 2 months	Those who used condoms consistently were 2.7 times more likely to have disclosed their status than those who reported inconsistent condom use; disclosure also related to condom use at last sex act, and having only 1 sex partner
Stein, Freedberg, Sullivan, et al (1998)[6] 203 multiethnic HIV+ men and women presenting for outpatient care in Boston, MA and Providence, RI, 1994-1996	60% had disclosed to all partners in the past 6 months; among individuals with 1 partner, 21% had not disclosed; 2+ partners, 58% did not disclose to all (ie, were inconsistent)	Overall, 43% reported using condoms all the time	Consistent disclosers, inconsistent disclosers, and nondisclosers reported similar rates of condom use; disclosure was related to fewer sexual partners
Sobel, Shine, DiPietro, and Rabinowitz (1996)[33] 200 HIV+ male and female outpatients (ethnicity not reported) at a municipal hospital in the South Bronx, NY, 1994	77% disclosed	50% of 119 sexually active in last 4 months reported consistent condom use and 41% reported inconsistent or no condom use; the only difference between these 2 groups was in proportion of partners who were HIV- or HIV?, which were 65% and 49%, respectively	No difference in proportion of consistent condom users vs. inconsistent/non-users who disclosed

Articles not summarized because they reported no association between disclosure and safer sex include: Norman et al (1998)[11] and Prestage et al (2001)[22] for the men-only group; Simoni et al (1995),[28] Clark et al (1997),[29] and Simoni et al (2000)[30] for the women-only group; and Kalichman (1999),[32] Ciccarone et al (2003),[4] and O'Brien et al (2003)[18] for the group of studies examining both men and women.

ual Hispanic men in Los Angeles,[27] safer sex was more likely to occur in the context of disclosure with respect to HIV-seronegative partners but not for partners with a positive or unknown HIV serostatus. Disclosers reported a smaller proportion of partners with whom they had unprotected anal insertive sex than nondisclosers in a multiethnic sample of male outpatients from Los Angeles.[1] Finally, among a US sample of mostly white MSM, no association between disclosure and sexual safety was reported with primary partners, but among nonprimary partners, disclosers were more likely than nondisclosers to report consistent condom use for insertive anal sex.[2]

Four of the studies we located had samples exclusively of women, but 3 did not provide data on the association between disclosure and sexual safety[28-30] and thus were omitted from the table. In all 4 studies, at least one third (and up to two thirds) of the sexually active HIV-seropositive women and girls reported unprotected sex. Data on disclosure, where reported, indicated that most informed their partners. Only Sturdevant and colleagues[31] provided data addressing the association between HIV disclosure to sexual partners and safer sex. They concluded that disclosure influenced safer sex among adolescents, based on analyses controlling for the perception that a partner was also HIV-infected, which indicated that without disclosure (vs. with disclosure), participants reported less condom use. However, there was no partner-level analysis (condom use was computed for up to 3 partners for each participant), and the timing of disclosure in relation to safer sex was not considered. Additionally, these results were obtained from a combined sample of HIV-seronegative and HIV-seropositive individuals.

In 9 studies, both men and women participated. Three reports did not provide data that would allow us to determine the relationship between disclosure and safer sex.[4,18,32] As shown in Table 1, 3 studies that did provide such data found no significant association. All 3 studies involved men and women who were recruited while seeking outpatient medical care: one recruited a sample in the Bronx, NY[33]; another sampled a predominantly African-American population in Milwaukee, WI[34]; and the third used comparable survey methods in both Providence, RI, and Boston, MA.[6] Three studies did show an association between disclosure and safer sex. One outpatient sample in New Orleans demonstrated that consistent condom users were more likely to disclose their serostatus than inconsistent condom users.[35] A study of adolescents indicated an association between unprotected sexual encounters and disclosure.[36] The remaining study reported a significant association for men but not women, with higher rates of condom use (especially during anal intercourse) among disclosers than among nondisclosers.[14]

In summary, only 15 of the 23 studies reviewed provided data that allowed us to examine the association between disclosure and safer sex. Fewer still provided a methodologically sound analysis, especially with respect to women. Those that did provided conflicting results, often with a significant effect limited to a subgroup of participants, such as HIV-seronegative or nonprimary partners. These findings provide little justification for concluding, as did Chen and colleagues, that there is an "urgent need" for prevention messages promoting disclosure of HIV serostatus to sexual partners.[37(p169)] (Note that their recommendation was based on a study that did not assess disclosure.)

Limitations of Research to Date

Lack of Partner-Level Analyses and Nonassessment of Timing

Our review of the studies in Table 1 revealed several methodological limitations of the published literature on disclosure and unsafe sex that future researchers should avoid. The greatest concerns are related: the dearth of partner-level analyses and the failure to assess the timing of HIV disclosure in relation to sexual activity. Researchers need to inquire about specific partners and perhaps even particular sexual incidents. It does not suffice to know whether an individual has informed partners and then whether protection was used over some specific timeframe. Many studies failed to accurately assess timing, if they considered the issue at all. For example, Ciccarone and colleagues[4] acknowledged they did not assess the timing of unprotected sex in relation to disclosure (they assessed only timing of any sex) and that it was possible that some participants had unprotected sex only after disclosing their positive serostatus. They proceeded to label this scenario "unlikely," although that possibility is exactly what studies like theirs are attempting to investigate. Furthermore, it is not sufficient to simply assess the number of partners and whether disclosure and safer sex ever occurred with each because, again, we cannot be sure that disclosure preceded safer sex. Of course, even if we know that disclosure preceded safer sex, the causal association is not assured.

Confounding Variables

Another major methodological limitation we noted was the failure of most studies to account for confounding variables. Numerous factors have been shown to be associated with disclosure, sexual safety, or both, and any of these might account for a demonstrated association or lack of association between disclosure and safer sex. Specifically, type of partnership should always be considered because research has shown it is often related to both disclosure and safer sex. Also, including partnership variables can help researchers avoid the problem of a third variable. As Sturdevant and colleagues noted in their study of adolescent girls, "There may be some quality to the relationship, unmeasured in the study, which may not only facilitate disclosure but permits more effective condom negotiation."[31(p68)] Research on partnership variables has demonstrated that "main/steady/close" partnerships are more likely to involve disclosure and more likely to involve unprotected sexual activity than "other/casual/unfamiliar" partnerships.[38] Also, as demonstrated among samples of both gay and bisexual men and heterosexual women, sex without disclosure is more likely to occur in nonexclusive than exclusive partnerships.[4,29] Finally, among HIV-infected women in steady partnerships, Simoni and colleagues found that being married, having a longer relationship, and receiving greater partner support were related to safer sex.[30]

Factors beyond the partnership might also confound the relationship between disclosure and safer sex. Specifically, illness severity and length of time since HIV diagnosis have been shown to positively relate to disclosure.[39] Younger age has been

related to less occurrence of disclosure to a main partner[18] and greater frequency of overall disclosure,[28] as well as riskier sexual practice after notification[40] and greater risk for transmitting HIV.[32] Perception that a partner's viral load is low or below detection has been associated with unprotected sex among HIV-infected MSM.[13] Race and ethnicity as well as level of acculturation among Latinos have been associated with both disclosure[28,41] and risky behavior.[42] Researchers also need to consider the context of the sexual activity, which might affect disclosure. As Serovich and Mosack explained, there is a difference between making love in one's private residence, where some verbal exchange might be expected, and an anonymous sexual encounter in a public restroom or other public sex venue, where norms of silence may prevail.[19] Finally, Marks and Crepaz found that different patterns of disclosure and sexual risk behavior were related to annual income and the use of alcohol or drugs before sex, among other factors.[20]

HIV Serostatus of Partner

Another partner variable that is crucial to include in any analysis of disclosure or safer sex is the HIV serostatus of the sexual partner, which has consistently been shown to correlate with both of these variables. For example, in 1994 Marks and colleagues reported that HIV-infected MSM disclosed to 90% of partners who were HIV-seropositive, 45% of partners who were HIV-seronegative, and 17% of partners with unknown serostatus.[1] Additionally, Marks and colleagues reported that disclosure to HIV-seropositive partners generally occurred in combination with unprotected contact, whereas disclosure to HIV-seronegative partners generally occurred in combination with protected contact.[27] HIV-infected individuals may be more likely to disclose to a partner who they know is HIV-seropositive for many reasons, such as their assessment of lowered risk of rejection. They then might have unsafe sex with this partner because they feel less threatening to the partner's health. Indeed, in a recent qualitative study, Sheon and Crosby found that disclosure of HIV serostatus appeared to facilitate unprotected anal intercourse among MSM in San Francisco.[43]

Sex and Sexual Orientation

Sex is another important variable with likely effects on disclosure and safer sexual behavior that many studies have ignored, often collapsing data across subgroups of men and women and making it impossible to determine direct effects of male or female sex. Dividing men into self-identified gay or bisexual versus heterosexual subgroups, as did Ciccarone and colleagues,[4] also may be illuminating because behavioral norms may differ in these respective communities. As these researchers pointed out, messages in the gay community encouraging the assumption that every partner is HIV-seropositive may have contributed to norms that consider disclosure optional.[4] Perhaps, alternatively, dividing samples into MSM and others (eg, men on the "down low," that is, men who have sex with men but who identify as heterosexual, and often wives or girlfriends with whom they have unprotected sex[44]) or separating self-identified gay from bisexual men may be necessary to avoid masking the effects of group differences in the potentially culturally bound behaviors of disclosure and safer sex.

Definitions of Unprotected Sex and Disclosure

Another limitation of the current research that needs to be addressed in future work is the imprecise and nonstandard operationalization of unprotected sex. Ciccarone and colleagues conducted one of the few studies to explicitly define unsafe sex as "unprotected anal insertive sex to ejaculation"[4(p951)]; in other studies, precise terminology is lacking. Some studies included unprotected oral contact under the category of unsafe sex (eg, Simoni et al[28,30]), others limited their definition to unprotected anal or vaginal intercourse (eg, Crepaz and Marks[23]), and some studies did not define the term "sex" at all for their participants (eg, Stein et al[6]). In one of the few studies that acknowledged this potential problem, Marks and Crepaz[20] conducted a secondary analysis of their data, widening their definition of unsafe sex to include unprotected insertive oral sex. The prevalence of unsafe sex in their sample increased from 25% to 40%; however, the association between disclosure and safer sex remained statistically nonsignificant.

Disclosure itself, though seemingly an uncomplicated behavior, also needs to be more explicitly operationalized and assessed. Some individuals may think they have disclosed their diagnosis when, in fact, their partners remain unaware of their serostatus. For example, some HIV-seropositive men who encounter HIV-seronegative men willing to engage in unprotected anal intercourse will assume their partners must also be HIV-infected, because no one would choose to put himself at risk of infection. The HIV-seronegative partners, in turn, may assume that their partners are also HIV-seronegative, otherwise, why would these men be putting others at risk? As Marks and Crepaz pointed out, disclosure may be a direct statement of the diagnosis or a more subtle communication such as leaving antiretroviral medications within view.[20] Among MSM in San Francisco, inferred preferences for sexual position, such as "top" or "bottom," are often construed as tacit disclosures of serostatus.[43]

Social Desirability

Finally, the effect of socially desirable reporting, which most authors failed to mention, may be a potential limitation in current studies and one that needs to be addressed in future research. Participants in the studies we reviewed were asked to acknowledge behaviors that are at least unethical if not also illegal. Few individuals could be expected to admit easily that they had knowingly exposed loved ones to a life-threatening illness without informing them of their risk. The stigmatizing nature of these assessed behaviors most likely has resulted in underreporting of their prevalence. Most problematic for the interpretation would be participants who might acknowledge one behavior but not the other, perhaps reasoning that it is not so incriminating to acknowledge having unprotected sex if they have at least divulged their HIV serostatus, or vice-versa. These observations might partially account for reports of the lack of a demonstrated association between disclosure and safer sex.

The social desirability a participant encounters in a study may be affected by the study's design and procedures. For example, studies that do not assure anonymity or that are conducted by persons affiliated with participants' clinic care may be particularly susceptible to the underreporting of nondisclosure and unsafe sex. Studies conducted in conjunction with behavioral counseling may promote response biases by establishing socially desirable behaviors.[45] Longitudinal studies, which exclude patients unwilling to adhere to follow-up visits, are prone to selection bias, which may affect reported rates of disclosure or safer sex. In fact, O'Brien and colleagues found that nondisclosure to sexual partners was less than 30% in 4 studies that were set in the context of longitudinal studies with behavioral counseling and greater than 30% in 6 of 8 studies that did not require follow-up or include counseling.[18]

Recommendations for Future Research

It is, of course, easier to critique past studies than to design and conduct improved ones. The host of methodological issues raised here underlies the difficulty of empirically determining whether disclosure of one's HIV-positive serostatus leads in a causal manner to safer sex. Indeed, it is difficult to imagine what the ideal study would involve. For obvious practical and ethical reasons, a researcher could not simply randomly assign HIV-infected people to "disclosure" or "nondisclosure" conditions and then assess the safety of their sexual activity with subsequent partners. Furthermore, decisions regarding sexual safety often cannot be made unilaterally and, even if they are, they may vary according to sexual partner. Most problematic is that disclosure, of course, does not actually "cause" safer sex any more than nondisclosure "causes" riskier sex. As suggested by the apt title of Marks and Crepaz, sexual activity takes place "within the context of" disclosure.[20] Finally, no design can possibly control for every possible third variable. For example, ethical responsibility might lead an individual to decide always to disclose and always to use condoms. In this case, the disclosure per se is not the cause or main reason for the safer sexual practices.

Theory specific to the disclosure of HIV is rare, and few studies have investigated any theoretical hypotheses empirically. Early theoretical work on self-disclosure (eg, Jourard, 1971[46]). is not highly relevant to the issue of HIV as it does not consider context (eg, the emotionally charged moment when disclosure often takes place), content (the highly stigmatizing nature of an HIV diagnosis), or consequences (which are often deleterious and include the potential loss of social support). Further, the work to date generally neglects cultural values (eg, the Latino value of "familismo"[28,41]) and the notion that disclosures can be dependent on contextual and situational factors (eg, the discloser's relationship to the target individual).[47] Mason and colleagues[41] assert that the theory of reasoned action[48] can explain most of the research on disclosure, although this hypothesis has not been fully tested. Building on work from earlier in the epidemic (eg, Marks, 1992[49]), in one of the few conceptual pieces on the topic, Serovich found good support for the consequence theory, which presumes that the relationship between disease progression and disclosure is moderated by anticipated consequences of disclosure.[50] However, this theory was still not predictive of disclosure to sexual partners. Additional empirical studies on theoretical aspects of HIV serostatus disclosure to sexual partners are clearly warranted.

A final recommendation for future research in this area is the need for more qualitative studies that focus specifically on HIV serostatus disclosure to sexual partners (eg,[43,51-54]). Many studies have used qualitative methodologies to focus on the consequences of disclosure to friends, employers, and even children. These studies are instructive but do not directly address the idea of safer-sex negotiation with a partner after disclosure has occurred. The complex and multiple emotions and motivations underlying decisions about disclosure and sexual protection might best be illuminated with qualitative methods of inquiry. For example, as Wolitski and colleagues[2] uncovered, disincentives to protected sex include the belief that condoms diminish sexual pleasure and intimacy, the desire to avoid acknowledging the risk of HIV infection, the heat of the moment, a shared sense of fatalism, and the desire to conceive among heterosexual couples. One theme that emerged in a recent study is that many MSM used substance use during sex as justification for not asking about or revealing HIV serostatus.[43] Ominously, these authors further concluded that the "men's fundamental unwillingness to ask or disclose suggests that [public health] messages focusing on the importance of knowing a partner's serostatus are misguided."[43(p2111)] Clearly, qualitative work on disclosure can be extremely enlightening regarding the cultural mores of subsets of the population, as well as the relative utility of prevention messages that focus on disclosure.

Summary and Conclusions

In a review of the published literature, we located 23 empirical studies on disclosure of HIV serostatus and sexual safety, among which 15 provided some data on the association between these 2 variables. However, methodological limitations in most of these precluded our making interpretations about the association of the 2 variables, let alone determining whether they were causally connected. In most of the studies that did adequately examine the association, the variables were not related. The implicit assumption that HIV serostatus disclosure leads to sexual safety may not be supported empirically because of informed exposure and uninformed protection, as detailed by Marks and Crepaz.[20] With respect to prevention efforts, the good news is that uninformed exposure is relatively rare; the bad news is that even a small number of such cases can fuel the epidemic.

The failure to demonstrate a consistent association between disclosure and safer sex does not necessarily mean that disclosure is irrelevant to the practice of safer sex; rather, as Marks and Crepaz suggested, it may be related in part to the frequency of uninformed protection and informed exposure.[20] Alternatively, Crepaz and Marks offered that disclosure does not always correlate with safer sex because disclosure is a relatively general communication.[23] It is insufficient to ensure the use of protection because it fails to focus specifically on the target

behavior of safer sex. The key to safer sex, as they suggested and their data supported, is whether the partners have explicitly discussed using protection and reached agreement about it.

Future researchers face the daunting task of designing and implementing methodologically rigorous studies that specifically measure disclosure and unprotected sexual behavior, employ a partner-level analysis, and control for potential confounding variables, including the partner's HIV serostatus and the type of relationship. Research suggests that practitioners from different disciplines and in numerous venues should not stop at encouraging disclosure of serostatus but, in addition, make the effort to help HIV-infected individuals develop the

Table **2**. Practice and Policy Implications for Health Care Practitioners From Existing Empiric Literature on HIV Disclosure and Sexual Safety

Providers' Roles	Health care practitioners of all types can encourage HIV-positive patients to discuss their serostatus with their sexual partners.[10,15] Mental health providers can assist HIV-infected individuals in divulging their diagnosis to sexual partners[56] using the following strategies: 1) Encourage clients to create a list of all persons they would consider telling 2) Have clients focus on those to be told first, as disclosure to these individuals should be planned strategically 3) Clients should pick the time and place (a relaxed atmosphere with minimal distractions, at a time when the target person is not tired, stressed, or emotionally unavailable) 4) Clients should consider how much they want to share regarding the activities that led to their HIV infection, including the option of not discussing the topic at all 5) Role-playing the likely scenarios can facilitate a successful exchange 6) Forewarn clients that disclosure is not a one-time event, but an unfolding process involving follow-up conversations Medical clinic providers should underscore the importance of safer sexual precautions[10,55] and encourage patients to disclose to past as well as present partners using the following strategies[15]: 1) Express empathy for the difficulty involved in disclosing 2) Have the patient explicitly state the pros and cons of disclosure 3) Avoid persuasion via moral arguments as it is usually ineffective 4) Describe experiences with successful disclosures and their positive outcomes among other patients
Populations to Target	• Certain subgroups of HIV-seropositive individuals are more likely to withhold disclosure and engage in risky sex. These include those who: – Recently tested seropositive for HIV[23] – Are of lower socioeconomic status[23] – Have experience with at-risk partners[23] – Are younger than 25 years of age[18,40] – Are involved in HIV-serodiscordant relationships[57] • Interventions may be particularly effective among gay men and their primary partners[1]
Intervention Strategies Should:	• Be more intensive[26,58] • Consider that disclosure is a process and not a one-time event[26] • Guard against furthering the stigmatization or marginalization of HIV-infected individuals[2] • Focus interventions on communication-skills training generally: encourage disclosure and also target negotiating condom use[11,23] • With regard to HIV-seropositive women, who can control disclosure but not necessarily condom use[31,59,60] : – Consider gender roles – Acknowledge power differentials – Incorporate male partners • Attempt to understand the reasons each individual chooses to disclose or not and address those issues specifically: – Focus altruistically on the needs and rights of partners[19] – Focus on personal benefits to disclosers, such as avoiding additional STDs or HIV superinfection that could limit the effectiveness of current or future antiretroviral treatment[61,62] • Incorporate, where appropriate, voluntary health department contact-tracing programs[15] • Tailor messages to circumstantial variables; for example, encourage sexually uninvolved men to disclose by addressing commonly perceived negative consequences of disclosing to prospective partners[11]
Policy Makers Should:	• Focus on increasing condom use and other safer sexual techniques rather than on disclosure specifically or exclusively[23,24] • Consider that only a small minority of HIV-infected adults do not disclose AND do not practice safer sex and that many of these individuals have HIV-seropositive partners[20] • Consider that advocating for disclosure may lead to a false sense of security: HIV-seronegative individuals might adjust their sexual safety based on a potential partner's disclosure, but a partner claiming to be HIV-seronegative may be unaware of an actual HIV infection

communication skills necessary to explicitly negotiate safer sex (see Table 2). Policymakers should rely on empirical evidence to guide their decisions in this arena. Based on the findings of this review, although information about a partner's HIV serostatus may play a role in one's choices about safer sex, disclosure alone does not automatically lead to safer sex in the way one might presume.

At this point in the epidemic, given the lack of success in decreasing the number of annual new infections, public health advocates might emphasize more innovative prevention strategies that rely on multiple target areas (eg, HIV education, availability of barrier protection, communication skills to negotiate safer sex) and multiple messengers (eg, primary care physician, mental health counselor, public health outreach worker). One lesson we learned from this review of HIV disclosure and sexual behavior may be useful in these endeavors: namely, human relationships and sexual interactions are vastly complex, with myriad motivations, incentives, and risks involved. Deceptively simple HIV prevention interventions such as encouraging disclosure will probably never succeed on their own.

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