# Gender-Related Factors Influencing HIV Serostatus Disclosure in Patients Receiving HAART in West Africa

C. Ndiaye, Department of Social and Preventive Medicine, Université de Montréal, Canada

C. Boileau, Department of Social and Preventive Medicine, Université de Montréal, Canada
M.V. Zunzunegui, Department of Social and Preventive Medicine, Université de Montréal, Canada

S. Koala, Association of African Solidarity, Ouagadougou, Burkina Faso

S. Ag Aboubacrine, Hôpital National du Point G, Bamako, Mali

P. Niamba, CHU Yalgado Ouédraogo, Ouagadougou, Burkina Faso

V.K. Nguyen, Department of Social and Preventive Medicine, Université de Montréal, Canada

S. Rashed, Department of Social and Preventive Medicine, Université de Montréal, Canada

Cathy Ndiaye, 2300 Saint Mathieu # 708, Montréal, Québec H3H 2J8, Canada Tel: 1-514-578-5080, Email: cathy.ndiaye@umontreal.ca

**Abstract**

Disclosure of HIV serostatus remains an important tool for the prevention of new infections and early initiation of treatment for HIV-positive individuals' regular sexual partners. Our aim is to identify factors associated with disclosure to partner in patients taking antiretroviral treatment, with a gender- and sex-based approach. In this study conducted in Mali and Burkina Faso, men (154) and women (164) who reported being in a marital or cohabitating relationship were included. Sex-specific bivariate analyses and multivariate logistic regression were performed to identify determinants of disclosure. Disclosure to partner was 72.1% in men and 79.9% in women. Results of bivariate and multivariate analyses indicated that cohabiting with partner was strongly associated with disclosure in both men

and women. In men only, older age, literacy and having good communication with the treating doctor were significantly associated with disclosure. Among women, disclosure was associated with having children and high self-reported importance of religion. Future research and interventions promoting disclosure should take into account these differences reflecting the social construction of gender roles in these settings.

## Introduction

One prominent public health recommendation for people with HIV/AIDS is to disclose, or tell others about, their diagnosis, especially their sexual partners (Rothenberg et al. 1995; UNAIDS 2000; Medley et al. 2004). In Africa, where the main route of transmission is heterosexual intercourse in married couples (Painter 2001; Freeman and Glynn 2004), disclosure of HIV serostatus by sexual partner prior to risky behaviours is thought to be particularly important in preventing this type of transmission (WHO 2004). As the availability of antiretroviral treatments (ART) grows, patients live longer and healthier lives but remain potential transmitters of the infection. There is a decreased risk of transmission with ART but sometimes increased sexual risk behaviour (Hoxworth et al. 2003). Therefore, risk of transmission in ART-treated patients is not null, and disclosure needs to be further examined and encouraged in this population.

Disclosure of HIV serostatus is crucial, not only for broader transmission prevention efforts, but also for the individual's health. In today's context of accelerated highly active antiretroviral treatment (HAART) use, partner disclosure may be necessary in a patient's effort to gain social and emotional support to ensure proper adherence to treatment and better therapeutic efficacy. Serostatus disclosure has been shown to initiate preventive sexual behaviour and increased care-seeking behaviour (King et al. 2008).

In African settings, partner disclosure has been extensively studied in cohorts of pregnant women who participate in voluntary counselling and testing programs in clinical settings (Medley et al. 2004). The majority of these studies have been conducted in a context of non-existent or limited access to ART. Reported rates of disclosure varied between 16.7% and 86% among women in developing countries. The lowest rates were among pregnant women tested in antenatal care and the highest in women who voluntarily got tested or attended counselling clinics. In general, the average reported rate of disclosure to steady or current partners was 49%, which is much lower than the average rate of 79% in developed countries (Medley et al. 2004). For men in Sub-Saharan Africa, there are few data on the rates of disclosure to primary sex partners, but we may hypothesize that they will be equal to or lower than rates reported for men in developed countries, which range between 67% and 88% (Sullivan 2005).

Previous studies have reported the following reasons for non-disclosure in African women: fear of discrimination or rejection, fear of divorce or violence, fear of accusations of infidelity, fear of blame and conflict with partner, and desire to protect loved ones (Hays et al. 1993; Gielen et al. 1997; Sowell et al. 1997; Levy et al. 1999; Gaillard et al. 2000; Antelman et al. 2001; Issiaka et al. 2001; Kilewo et al. 2001; Maman et al. 2002; Medley et al. 2004). These fears reflect the degree of individuals' perceptions of stigma, and the context contributing to these fears should be better comprehended. HIV/AIDS-associated stigma refers to attitudes or perceptions of shame, disgrace, blame or dishonour associated with the disease (Cock 2002) and has been reported to have a negative impact on disclosure (Petrak et al. 2001; Chandra et al. 2003).

In addition, disclosure to spouse or cohabitating partner has been shown to be influenced by psychosocial and economic factors: demographic characteristics such as older age (Serovich and Mosack 2003), higher education (Farquhar et al. 2001), monogamous marital status (Antelman et al. 2001); economic factors such as high income (Crepaz and Marks 2003) and financial dependence (Antelman et al. 2001); and psychosocial variables such as high religiosity (Ciccarone et al. 2003) and good social support (Greene and Serovich 1996; Petrak et al. 2001). Factors that characterize the relational context in which people live – for instance, good quality of spousal communication, and longer duration and stability of the relationship – have also been consistently found to be associated

with serostatus disclosure (King et al. 2008). It is important to note that some of these studies have been conducted in non-African settings, and findings cannot necessarily be generalized from the American to the African context.

In this study, we report on the determinants of partner disclosure specific to men and women receiving ART in Mali and Burkina Faso. This is the first report of partner disclosure in patients in settings characterized by low HIV prevalence and predominance of Muslim faith. Both these factors can be hypothesized to influence partner disclosure, which would therefore differ in settings such as Eastern Africa, where prevalence is higher, and in Southern Africa, where prevalence is also much higher and Christian faith is predominant. In these settings, access to formal employment is limited, state benefits are scarce and traditional family and religious structures play an important role as purveyors of social security (Nguyen et al. 2007). Women's social position is strongly tied to their role in the domestic sphere as mothers and providers of care, while for men it is linked to their role as breadwinner outside the home. Thus, we hypothesized that higher socio-economic status would be associated with disclosure in men, as this is a measure of male power. As a corollary, we hypothesized that women with less power would be more likely to disclose.

Because women's and men's behaviours and decision making are defined by social, cultural and religious norms, factors influencing disclosure to partner may be different for men and women. Thus, we used a gender- and sex-based analysis (GSBA) in an attempt to understand biological (sex-based) and socio-cultural (gender-based) differences between men and women, without presuming that any such differences exist (Canadian Institute of Health Research [CIHR] 2008).

The objectives of our study were to describe the prevalence and to identify the main determinants of serostatus disclosure to spouse or cohabitating partner in men and women treated with HAART in two low-prevalence West African countries.

## Methods

### Setting

The study was conducted in six HAART-delivery sites in the capital cities of Mali and Burkina Faso, respectively, Bamako and Ouagadougou. The two countries are neighbours, with similar cultural, economic and religious contexts, and similar epidemiological and virological profiles. According to the 2006 report on the global epidemic on AIDS, the estimated HIV prevalence rate in adults aged 15 to 49 is 1.7% in Mali and 2% in Burkina Faso (UNAIDS 2006). This multicentre cross-sectional study is part of a larger research project on the efficacy of antiretroviral therapy and assessment of adherence in resource-limited settings. The larger study, titled "Building capacity to reinforce adherence to antiretroviral therapy and sexual prevention for patients in or from resource-limited settings," was funded by the CIHR and carried out in 2004. The overall goal was to find means to maintain adherence to ART and thus sustain treatment efficacy. The specific goals were to describe (1) the immunological and clinical response to ART, (2) adherence to ART, (3) consistency of condom use and (4) serostatus disclosure to regular sexual partner.

### Sampling and Recruitment

HIV-infected patients were recruited in three public hospitals and three community-based organizations that provided counselling, psychosocial support and medical care including antiretroviral therapy. We interviewed 649 men and women, using a standardized questionnaire. Only men (154) and women (164) who reported being in marital or cohabitating relationships were included in this analysis. The remaining subjects (51%) in our study were not engaged in these types of relationships and were either single or widowed. Upon visiting the physician for their regularly scheduled visits, patients who were eligible for the study were invited to participate, asked for their consent and enrolled. Patients were eligible if they had been on antiretroviral treatment for more than 6 months. Exclusion criteria were being HIV negative, being under 18 years old and refusing to give consent. Ethical approval was received from the appropriate ethics committee in each study country as well as in Canada (Université de Montréal).

### Data Collection and Measures

A questionnaire was used to collect information on demographic and socio-economic status, adherence to antiretroviral treatment, and partner disclosure, as well as a set of potential determinants of these two behaviours, selected from the literature. The questionnaire was administered in face-to-face interviews by trained interviewers.

The outcome variable was serostatus disclosure. Disclosure to regular sexual partners was assessed using yes/no questions ("Have you disclosed your HIV status to your partner(s)?"). For polygamous unions, we considered that the patients had disclosed if all spouses or cohabitating partners had been notified. In our analysis, potential determinants of disclosure were identified by a review of the literature and by consultations with local caregivers and patient focus groups. These determinants were factors associated with demographic, economic, psychosocial, health status and treatment factors.

Demographic variables included (1) age, (2) literacy (the self-reported ability to read and write in French – literacy in French is a marker of educational attainment), (3) having children and (4) living with partner (the patient was asked if he/she lived under the same roof as the person identified as the regular sexual partner). The financial situation was measured by the main source of income: (1) partner, (2) family or (3) self-earned income. Psychosocial variables were (1) social support (defined as having a source of support when needed and categorized by the main source of support: spouse, other or none), (2) communication about HIV to family (defined as having discussions about HIV in general with family members), (3) quality of relationship with physician (six items measuring the availability and competence of the physician and his/her ability to counsel the patient on treatment), (4) involvement in patients-living-with-HIV (PLWHIV) support group (defined as participating in at least one type of PLWHIV activity) and (5) perception of religion in patient's life (measured by the question "How important is religion in your life?", for which the answer choices were high or low importance.)

As for treatment factors, there were two types of prescription sites: public hospitals or community-based organizations(CBOs). Perceived health was measured by asking the patient to rate his/her health status (good or bad). Lastly, information on time since diagnosis was collected from the patient's medical file. Appendix 1 provides an overview of the contents of the questionnaire used to collect data for this study.

### Statistical Analysis

Bivariate analyses were conducted to identify factors associated with serostatus disclosure to partner (chi-square statistics for binary or categorical independent variables, ANOVA with 1dl for continuous variables). This analysis was carried out separately for men and women.

Sex-specific binary logistic regression was used to assess the association of disclosure with covariates according to the results of the bivariate analysis. We screened variables on the basis of their p-value from the results of the sex-specific bivariate analysis ($p \leq 0.25$ either in the men's or the women's sample). All variables were entered together and removed in a backward stepwise fashion if $p > 0.10$. For the final models, multivariable-adjusted ORs, their 95% confidence intervals and p-values were calculated separately for men and women. SPSS Version 12 was used.

## Results

### Demographics

In our study population, the mean age was 39 years, 51.8% were women, 75% were Muslim and 25% were Christian; 57.5% were from Mali and 42.5% from Burkina Faso. Eleven percent of our total sample was unemployed; among women, 25% were housewives; 72% of patients had been on HAART for more than 1 year; and 67.5% of patients were treated in hospital-based sites versus 32.5% in CBOs.

### Sex-Specific Bivariate Analyses (Table 1)

Prevalence of disclosure to partner in our sample was frequent: 72.1% in men and 79.9% in women

($p$ = 0.10). Cohabiting with partner was strongly associated with disclosure among both men and women. The number of men who were not cohabiting with their partner was small ($n$ = 14), but differences in disclosure between cohabiting (75.5%) and not cohabiting (42.9%) were significant ($p$ = 0.009). Disclosure was also less frequent among women not cohabiting with their partner (58.1%) as compared with women living with their partner (86.2%) ($p$ < 0.001) (Table 1). As expected, women and men who felt more stigmatized were less likely to disclose their status to their partner.

**Table 1. Percentage of HIV-positive men and women receiving HAART who have disclosed their serostatus to their spouse or cohabitating partner**

| Characteristics | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | n = 154 | Disclosure (%) | p-value | n = 164 | Disclosure (%) | p-value |
| **Demographic and economic factors** | | | | | | |
| Age (in years) | | | | | | |
| ≤34 | 14 | 42.9 | 0.011 | 73 | 80.8 | 0.787 |
| >34 | 140 | 75 | | 91 | 79.1 | |
| Literacy | | | | | | |
| No | 53 | 56.6 | 0.002 | 69 | 82.6 | 0.457 |
| Yes | 101 | 80.2 | | 95 | 77.9 | |
| Having children | | | | | | |
| No | 11 | 72.7 | 0.960 | 26 | 61.5 | 0.011 |
| Yes | 143 | 72.0 | | 138 | 83.3 | |
| Financial resource | | | | | | |
| Partner | 10 | 70.0 | 0.914 | 89 | 86.5 | 0.054 |
| Salarya | 125 | 72.8 | | 54 | 74.1 | |
| Family/other | 19 | 68.4 | | 21 | 66.7 | |
| **Psychosocial factors** | | | | | | |
| Living with partner | | | | | | |
| No | 14 | 42.9 | 0.009 | 31 | 58.1 | <0.001 |
| Yes | 139 | 75.5 | | 130 | 86.2 | |
| Social support | | | | | | |
| None | 80 | 70.0 | 0.223 | 36 | 77.8 | 0.171 |
| From partner | 23 | 87.0 | | 82 | 85.4 | |
| From others | 51 | 68.6 | | 46 | 71.7 | |
| Communication about HIV with familyb | | | | | | |
| No | 115 | 68.7 | 0.108 | 107 | 80.4 | 0.743 |
| Yes | 39 | 82.1 | | 55 | 78.2 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Involvement in PLWHIV support group | | | | | | |
| No | 90 | 68.9 | 0.296 | 86 | 76.7 | 0.293 |
| Yes | 64 | 76.6 | | 78 | 83.3 | |
| Quality of patient-physician relationship | | | | | | |
| Bad | 46 | 58.7 | 0.016 | 44 | 77.5 | 0.210 |
| Good | 108 | 77.8 | | 120 | 79.9 | |
| Religiosity | | | | | | |
| Not important | 29 | 62.1 | 0.182 | 24 | 62.5 | 0.022 |
| Important | 125 | 74.4 | | 140 | 82.9 | |
| **Health status and treatment factors** | | | | | | |
| Perceived health | | | | | | |
| Bad | 71 | 73.2 | 0.766 | 70 | 78.6 | 0.719 |
| Good | 83 | 71.1 | | 94 | 80.9 | |
| Prescription site | | | | | | |
| Hospital | 47 | 69.0 | 0.223 | 55 | 77.1 | 0.206 |
| CBO | 107 | 78.7 | | 109 | 85.5 | |
| Time since diagnosis (in months) | | | | | | |
| 6–11 | 18 | 66.7 | 0.667 | 24 | 75.0 | 0.407 |
| 12–23 | 47 | 70.2 | | 40 | 80.0 | |
| 24–35 | 26 | 80.8 | | 41 | 73.2 | |
| ≥36 | 54 | 75.9 | | 52 | 86.5 | |

CBO = community-based organization; HAART = highly active antiretroviral treatment;
PLWHIV = patients living with HIV.
a Salary including revenue from own business or by commission (services).
b Communication about HIV with family excluding partner.

There were some differences between men and women. Men aged 34 years or less had the lowest disclosure rate (42.9% vs. 75% for patients aged over 34 years, $p = 0.011$ ). Male patients who were illiterate disclosed less than those who could read and write in French (56.6% vs. 80.2%, $p = 0.002$). Men who communicated about HIV with a family member other than the spouse tended to disclose their serostatus more frequently than men who did not communicate (82.1% vs. 68.7%, $p = 0.108$), and patients who reported good communication with their physician were more likely to disclose than those with poor communication (77.8% vs. 58.7%, $p = 0.016$) (Table 1).

For women, disclosure was more frequent among those who had one or more children (83.3% vs. 61.5%, $p = 0.011$) compared with women who had no children; women who depended financially on their partner were also more likely to disclose than those who depended on their family or on other sources of income (86.5% vs. 66.7%, $p = 0.054$). Women who considered religion important disclosed more frequently (82.9% vs. 62.5%, $p = 0.022$) (Table 1). Social support was not significantly associated with disclosure for men or women.

## Sex-Specific Multivariate Analyses (Table 2)

In multivariable-adjusted logistic models (Table 2), the association between serostatus disclosure and living with partner persisted among women. Among men, this association became non-significant, probably due to the small number of men who were not cohabiting with the spouse. However, communication about HIV with a family member other than the spouse emerged as an important factor for disclosure in both sexes (OR = 5.345; 95% CI = 2.204–12.963 in men and OR = 2.512; 95% CI = 0.887–7.117 in women). For men, the associations of disclosure with older age (OR = 0.014; 95% CI = 1.377–17.424) and with literacy (OR = 0.005; 95% CI = 1.410–6.906) were strengthened in multivariate analysis. For women, the multivariate logistic model suggested that having children (OR = 2.615; 95% CI = 0.888–7.698) and perceived importance of religion increased the likelihood of disclosing (OR = 2.644; 95% CI = 0.924-7.564). All analyses met the goodness-of-fit criterion of Hosmer-Lemeshow test (p = 0.907 for men and p = 0.219 for women).

**Table 2 – Multivariable adjusted odds ratio for disclosure by selected associated factors from binary logistic regression in men and women**

| | **Men** | | | **Women** | | |
|---|---|---|---|---|---|---|
| | **OR** | **95 % CI** | **p-value** | **OR** | **95 % CI** | **p-value** |
| | | | | | | |
| Age (in years) | | | | | | |
| > 34 vs. ≤ 34 | 4.898 | 1.377 – 17.424 | **0.014** | | | |
| Literacy | | | | | | |
| Yes vs. No | 3.121 | 1.410 – 6.906 | | | | |
| Having children | | | | | | |
| Yes vs. No | | | | 2.615 | 0.888-7.689 | 0.081 |
| Living with partner | | | | | | |
| Yes vs. No | | | | 4.053 | 1.610 – 10.206 | **0.003** |
| Communication with family about HIV | | | | | | |
| Yes vs. No | 5.345 | 2.204-12.963 | **<0.001** | 2.512 | 0.887-7.117 | 0.083 |
| Religiosity | | | | | | |
| High vs. Low | | | | 2.644 | 0.924 – 7.564 | 0.070 |
| Patient-physician relationship | | | | | | |
| Good vs. Bad | 3.095 | 1.272- 7.529 | **0.013** | | | |

## Discussion

Disclosure is an important public health strategy for the prevention of new infections. First, disclosure may initiate testing of HIV-positive sexual partners, lead couples to adopt safe sexual behaviours, increase chances for social support and alleviate psychological stress and anxiety. Second, disclosure may facilitate early access to necessary medical care and antiretroviral treatment. Finally, disclosure may reduce stigmatization and increase awareness of the HIV epidemic as more individuals reveal their seropositivity.

This study explores factors associated with disclosure of HIV status to sexual partners according to sex in a sample of West African patients under antiretroviral treatment. Prevalence of disclosure was frequent for both men and women: 72.1% for men and 79.9% for women. These figures are higher than those found in developing countries among HIV-positive subjects, with or without treatment, with an overall estimate of 49% disclosure prevalence (Medley et al. 2004). In our study, 25% of patients are non-disclosers. These results are comparable to those reported in other studies in similar populations. Skogmar et al. (2006) found in a study conducted in 144 HIV-positive men and women in Johannesburg that 21% had not disclosed to their sexual partners. Olley and al. (2004) found a 22% rate of non-disclosure to partner, and Nachega et al. (2005) reported that 38% of their study subjects in Soweto did not disclose to their partner.

Living with partner was strongly associated with disclosure in women and also in men. These findings show that partnership characteristics most likely in long-term exclusive relationships explain some decisions to conceal or reveal an HIV diagnosis to partner. Cohabiting is part of the context that influences disclosure decisions, since patients may choose to disclose when they feel close to their spouse or cohabitating partner. In favour of this argument, high spousal support and the feelings of trust and confidence have been associated with disclosure (Stein et al. 1998; Klitzman 1999; Semple 1999). Therefore, efforts to reinforce the quality of the relationship between men and women and to improve communication in the couple should be encouraged.

Differences in factors associated with serostatus disclosure reflect the gender-specific role that women and men play in West African societies. Analyses revealed that being educated and older led men to disclose more. In addition, a good patient–physician relationship seemed to favour disclosure in men, but not in women. Stoicism, a value of masculinity, does not enhance disclosure: men with poor communication with their doctor may also be more likely to avoid disclosure of serostatus to their partner. These three aspects – older age, higher education and good communication with the treating physician – may be indicative of self-assurance in dealing with HIV seropositivity.

In contrast, women were more influenced by their responsibilities as mothers and wives. Taking care of children, an essentially female responsibility, and being dependent on partner for financial needs seemed to encourage women to disclose. Because women in Sub-Saharan Africa are generally expected to consult their husband for most decisions concerning daily activities, including personal health, practical reasons may push them to disclose. Hence, we suppose that women mainly report to their husband because it is difficult to conceal taking medication and making regular visits to the physician. Self-reported importance of religion was significantly associated with disclosure among women. Religiosity had been previously shown to be associated with more altruistic or socially responsible behaviours among seropositive individuals (Ciccarone et al. 2003). Individuals living with HIV often experience shame and guilt, especially women who fear leaving their children orphaned and practice religion and spirituality the most (Dozier 1998; Pargament et al. 2004). Results of the multivariate analyses support gender differences noted in the mechanisms governing decisions about partner disclosure, though communication with family members about HIV appeared to favour disclosure. But community organizations do not seem to be related to disclosure in our data.

Most patients in our study sample (86%) had known their seropositive status for longer than 1 year, and most of them had started HAART treatment because of symptoms compatible with an AIDS diagnosis. The fact that probability of disclosure did not increase significantly with time since the patient first learned of his/her serostatus may mean that decisions about disclosure are often taken at time of diagnosis. We could not capture this association because our patients were recruited after 6 months of treatment. But in our study, most of the people who had decided not to disclose their serostatus seemed to be long-term non-disclosers. This suggests that interventions to promote disclosure are either non-existent or ineffective. In addition, self-rated health is not related to disclosure, suggesting that in spite of deteriorating health, some patients are able to hide their HIV status from their family network.

Sexual partners of people infected with HIV are particularly at risk of acquiring the infection.

Effective means of reducing this risk would be to target PLWHIV and concentrate our prevention efforts on this population (Janssen et al. 2001). Antiretroviral treatment programs would be important entry points to undertake prevention with HIV-positive patients. Moreover, regular visits would allow prevention messages to be reinforced. Within a stable couple, the use of the condom is particularly difficult to promote, and disclosure is a crucial step in the negotiation process for condom use.

In Mali, a law passed in 2006 gives physicians the right to disclose patients' serostatus if patients do not notify their regular sexual partners in the 15 days following HIV diagnosis. The frequency of use and the impact of this law on disclosure rates have not been reported in any official documents. Although the goal is to reduce transmission and identify those who may need medical care, compulsory disclosure may not be an appropriate solution, as patients may not be ready to manage the potential consequences associated with status disclosure. But this suggests that disclosure may be enhanced by employing third parties to break the news. The third party need not be a health professional; a close family member or friend could be chosen instead. Finally, individual and psychosocial counselling should be provided to all patients to help in dealing with misunderstandings and stigmatization that could arise following serostatus disclosure.

There are potential limitations in this study. First, cross-sectional design has inherent limitations. We do not know how much time has elapsed between diagnosis and disclosure or what the clinical status of the patient was at the time of diagnosis. According to Medley et al. (2004), length of time since diagnosis and severity of illness are positively associated with disclosure, but in our population this was not the case. In addition, disclosure might have preceded the measurement of some explanatory factors. Second, limited sample size did not allow for further interaction tests, as cell sizes were small when stratified according to sex. Third, the study was also limited by the fact that it included only patients under treatment, and thus results cannot necessarily be applied to patients who are naïve to ART or have learned their status recently. Finally, this cohort may not be representative of all treated patients in Mali. We have only recruited patients who live in Bamako, the capital city. Determinants of disclosure may differ in those who live in more conservative towns or villages.

We need to better understand the contexts in which disclosure occurred. We have only a limited perspective on this complex behaviour, which has a preliminary phase and consequences. But the aim of the original study was not to study disclosure, and we were limited in the choice of the possible correlates of disclosure among the variables available in the data base. A longitudinal research in a similar cohort would be more appropriate to establish causality and to provide an exhaustive list of potential determinants of disclosure. Finally, self-reported behaviour is subject to reporting bias. There is a possibility that social desirability influenced patients' answers to some questions.

## Conclusion

In view of the expanding access to HAART in Africa, there is a pressing need to reinforce behavioural interventions to prevent HIV transmission. Serostatus disclosure was frequent among HAART-treated patients in stable partnerships, but efforts are still needed to improve disclosure rates and prevent heterosexual transmission in this population. In low-prevalence settings, it is more difficult to target people living with HIV/AIDS for positive prevention. Possible interventions could be to target improved communication between male patients and their spouses, notably by counselling men how to bring up conversations around HIV with family members to "prepare the terrain" for disclosure later on. For women, outreach programs with religious groups should include discussion of partner disclosure. Mother–child health programs are also important entry points for discussing partner disclosure and couples communication. Since disclosure seems to have different patterns in men and women, interventions aimed at increasing disclosure rates should take these differences into account. Future research should explore identification of methods that facilitate disclosure to partners. These methods should be tailored to the cultural, social, religious and gender norms in Sub-Saharan countries.

## REFERENCES

Antelman, G., M.C. Smith Fawzi, S. Kaaya, J. Mbwambo, G.I. Msamanga, D.J. Hunter and W.W. Fawzi. 2001. "Predictors of HIV-1 Serostatus Disclosure: a Prospective Study among HIV-Infected Pregnant Women in Dar Es Salaam, Tanzania." *AIDS* 15(14): 1865–74.

Canadian Institute of Health Research. *Gender and Sex-Based Analysis in Health Research: A Guide for CIHR Researchers and Reviewers*. Retrieved July 10, 2008. <http://www.cihr-irsc.gc.ca/e/32019.html>.

Chandra, P.S., S. Deepthivarma and V. Manjula. 2003. "Disclosure of HIV Infection in South India: Patterns, Reasons and Reactions." *AIDS Care* 15(2): 207–15.

Ciccarone, D.H., D.E. Kanouse, R.L. Collins, A. Miu, J.L. Chen, S.C. Morton and R. Stall. 2003. "Sex without Disclosure of Positive HIV Serostatus in a US Probability Sample of Persons Receiving Medical Care for HIV Infection." *Am J Public Health* 93(6): 949–54.

Cock, K.M., D. Mbori-Nqacha and E. Marum 2002. "Shadow on the Continent: Public Health and HIV/AIDS in Africa in the 21st Century." *Lancet (British Edition)* 360(9326): 67–72.

Crepaz, N. and G. Marks 2003. "Serostatus Disclosure, Sexual Communication and Safer Sex in HIV-Positive Men." *AIDS Care* 15(3): 379–87.

Dozier, J. 1998. "Lived Experience of HIV Positive Women." *Dissertation Abstracts. International Section A: Hum Soc Sci* 58: 4447.

Farquhar, C., D.A. Mbori-Ngacha, R.K. Bosire, R.W. Nduati, J.K. Kreiss and G.C. John. 2001. "Partner Notification by HIV-1 Seropositive Pregnant Women: Association with Infant Feeding Decisions." *AIDS* 15(6): 815–7.

Freeman, E.E. and J.R. Glynn. 2004. "Factors Affecting HIV Concordancy in Married Couples in Four African Cities." *Aids* 18(12): 1715–21.

Gaillard, P., C. Verhofstede, F. Mwanyumba, P. Claeys, V. Chohan, K. Mandaliya, J. Bwayo, J. Plum and M. Temmerman. 2000. "Exposure to HIV-1 during Delivery and Mother-to-Child Transmission." *Aids* 14(15): 2341–8.

Gielen, A.C., P. O'Campo, R.R. Faden and A. Eke. 1997. "Women's Disclosure of HIV Status: Experiences of Mistreatment and Violence in an Urban Setting." *Women Health* 25(3): 19–31.

Greene, K. and J.M. Serovich. 1996. "Appropriateness of Disclosure of HIV Testing Information: the Perspective of the Plwas." J *Appl Commun Res* 24(1): 50–65.

Hays, R.B., L. McKusick, L. Pollack, R. Hilliard, C. Hoff and T.J. Coates. 1993. "Disclosing HIV Seropositivity to Significant Others." *AIDS* 7(3): 425–31.

Hoxworth, T., N.E. Spencer, T.A. Peterman, T. Craig, S. Johnson and J.E. Maher. 2003. "Changes in Partnerships and HIV Risk Behaviors after Partner Notification." *Sex Transm Dis* 30(1): 83–8.

Issiaka, S., M. Cartoux, O. Ky-Zerbo, S. Tiendrebéogo, N. Meda, F. Dabis and P. Van de Perre; Ditrame Study Group. 2001. "Living with HIV: Women's Experience in Burkina Faso, West Africa." *AIDS Care* 13(1): 123–8.

Janssen, R.S., D.R. Holtgrave, R.O. Valdiserri, M. Shepherd, H.D. Gayle, K.M. de Cock. 2001. "The Serostatus Approach to Fighting the HIV Epidemic: Prevention Strategies for Infected Individuals." *Am J Public Health* 91(7): 1019–24.

Kilewo, C., A. Massawe, E. Lyamuya, I. Semali, F. Kalokola, E. Urassa, M. Giattas, F. Temu, K. Karlsson, F. Mhalu and G. Biberfeld. 2001. "HIV Counseling and Testing of Pregnant Women in Sub-Saharan Africa: Experiences from a Study on Prevention of Mother-to-Child HIV-1 Transmission in Dar Es Salaam, Tanzania." *J Acquir Immune Defic Syndr* 28(5): 458–62.

King, R., D. Katuntu, J. Lifshay, L. Packel, R. Batamwita, S. Nakayiwa, B. Abang, F. Babirye, P. Lindkvist, E. Johansson, J. Mermin and R. Bunnell. 2008. "Processes and Outcomes of HIV Serostatus Disclosure to Sexual Partners among People Living with HIV in Uganda." *AIDS Behav* 12(2): 232–43.

Klitzman, R.L. 1999. "Self-Disclosure of HIV Status to Sexual Partners: a Qualitative Study of Issues Faced by Gay Men." *Journal of the Gay and Lesbian Medical Association* 3(2): 39–49.

Levy, A., F. Laska, A. Abelhauser, J.F. Delfraissy, C. Goujard, F. Boué and J. Dormont. 1999. "Disclosure of HIV Seropositivity." *J Clin Psychol* 55(9): 1041–9.

Maman, S., J.K. Mbwambo, N.M. Hogan, G.P. Kilonzo, J.C. Campbell, E. Weiss and M.D. Sweat. 2002. "HIV-Positive Women Report More Lifetime Partner Violence: Findings from a Voluntary Counseling and Testing Clinic in Dar Es Salaam, Tanzania." *Am J Public Health* 92(8): 1331–7.

Medley, A., C. Garcia-Moreno, S. McGill and S. Maman. 2004. "Rates, Barriers and Outcomes of HIV

Serostatus Disclosure among Women in Developing Countries: Implications for Prevention of Mother-to-Child Transmission Programmes." *Bull World Health Organ* 82(4): 299–307.

Nachega, J.B., D.A. Lehman, D. Hlatshwayo, R. Mothopeng, R.E. Chaisson and A.S. Karstaedt. 2005. "HIV/AIDS and Antiretroviral Treatment Knowledge, Attitudes, Beliefs, and Practices in HIV-Infected Adults in Soweto, South Africa." *J Acquir Immune Defic Syndr* 38(2): 196–201.

Nguyen, V.K., C.Y. Ako, P. Niamba, A. Sylla and I. Tiendrébéogo. 2007. "Adherence As Therapeutic Citizenship: Impact of the History of Access to Antiretroviral Drugs on Adherence to Treatment." *AIDS* 21(Suppl 5): S31–5.

Olley, B.O., S. Seedat and D.J. Stein. 2004. "Self-Disclosure of HIV Serostatus in Recently Diagnosed Patients with HIV in South Africa." *Afr J Reprod Health* 8(2): 71–6.

Painter, T. M. 2001. "Voluntary Counseling and Testing for Couples: a High-Leverage Intervention for HIV/AIDS Prevention in Sub-Saharan Africa." *Soc Sci Med* 53(11): 1397–411.

Pargament, K.I., S. McCarthy, P. Shah, G. Ano, N. Tarakeshwar, A. Wachholtz, N. Sirrine, E. Vasconcelles, N. Murray-Swank, A. Locher and J. Duggan. 2004. "Religion and HIV: a Review of the Literature and Clinical Implications." *South Med J* 97(12): 1201–9.

Petrak, J.A., A.M. Doyle, A. Smith, C. Skinner and B. Hedge. 2001. "Factors Associated with Self-Disclosure of HIV Serostatus to Significant Others." *Br J Health Psychol* 6(Pt 1): 69–79.

Rothenberg, K.H., S.J. Paskey, M.M. Reuland, S.I. Zimmernan, and R.L. North. 1995. "Domestic Violence and Partner Notification: Implications for Treatment and Counseling of Women with HIV." *J Am Med Womens Assoc* 50(3–4): 87–93.

Semple, S.J., T.L. Patterson, W.S. Shaw, C.T. Pedlow and I. Grant. 1999. "Disclosure of HIV Seropositivity to Sexual Partners: an Application of Social Cognitive Theory." *Behav Ther* 30: 223–237.

Serovich, J. M. and K.E. Mosack. 2003. "Reasons for HIV Disclosure or Nondisclosure to Casual Sexual Partners." *AIDS Educ Prev* 15(1): 70–80.

Skogmar, S., D. Shakely, M. Lans, J. Danell, R. Andersson, N. Tshandu, A. Odén, S. Roberts and W.W. Francois Venter. 2006. "Effect of Antiretroviral Treatment and Counselling on Disclosure of HIV-Serostatus in Johannesburg, South Africa." *AIDS Care* 18(7): 725–30.

Sowell, R.L., A. Lowenstein, L. Moneyham, A. Demi, Y. Mizuno and B.F. Seals. 1997. "Resources, Stigma, and Patterns of Disclosure in Rural Women with HIV Infection." *Public Health Nurs* 14(5): 302–12.

Stein, M.D., K.A. Freedberg, L.M. Sullivan, J. Savetsky, S.M. Levenson, R. Hingson and J.H. Samet. 1998. "Sexual Ethics. Disclosure of HIV-Positive Status to Partners." *Arch Intern Med* 158(3): 253–7.

Sullivan, K.M. 2005. "Male Self-Disclosure of HIV-Positive Serostatus to Sex Partners: a Review of the Literature." *J Assoc Nurses AIDS Care* 16(6): 33–47.

UNAIDS. 2000. "Opening up the HIV/AIDS Epidemic: Guidance on Encouraging Beneficial Disclosure, Ethical Partner Counselling & Appropriate Use of HIV Case-Reporting." *Best Practice Collection*. Geneva: UNAIDS.

UNAIDS. 2006. *Report on the Global AIDS Epidemic.* Geneva: UNAIDS.

WHO. 2004. "Gender Dimensions of HIV Status Disclosure to Sexual Partners: Rates, Barriers and Outcomes. A Review Paper." Geneva: WHO.

Appendix 1: Questionnaire Overview

| Data collected | Main Variables |
|---|---|
| Sociodemographic characteristics | Sex, age, date of birth, highest level of education, occupation, marital status, number of children, religion |
| Financial status | Financial resources, assets, monthly revenue, financial responsibilities |
| Social environment | Household occupants, stressful events |
| Serostatus disclosure | Date of HIV diagnosis, motivations for screening, disclosure of HIV status to all sexual partners, friends and family |
| Openness about HIV serostatus | Communication about living with HIV with family and friends or other HIV+ individuals |
| Social support | Identification of providers of moral support and quality of support received |
| Stigmatization | 12-item stigmatization scale |
| Perceived health status and food insecurity | Self-rated health status, description of quantity and quality of food intake, alcohol consumption |
| Involvement in HIV+ organizations | Participation in HIV focus and volunteer groups |
| Sexual behaviour | Frequency of condom use, number of sexual partners |
| Knowledge about HAART | Perceived HAART efficacy and knowledge of risks about non-adherence |
| Clinical data | Weight, height, clinical evaluation, HIV type |
| Laboratory results | Virological, immunological, haematological and biochemical data |
| Prescribed treatment | Type, dose and duration of antiretroviral treatment |
| Adherence to HAART | Number of missed pills and reasons for non-adherence |