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## The Role of HIV Serostatus Disclosure on Sexual Risk Behaviours among People Living with HIV in Steady Partnerships in Rio de Janeiro, Brazil

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### Abstract

Understanding partnership dynamics is a crucial step in the process of HIV serostatus disclosure to partners. This study examines the relational characteristics associated with HIV serostatus disclosure and the role of disclosure on sexual behaviours within steady partnerships among people living with HIV (PLHIV) in Rio de Janeiro, Brazil. Study participants from 6 large public health facilities were surveyed to investigate psychosocial and relational factors associated with sexual health and well-being. Among 489 individuals in steady partnerships, 86% reported HIV serostatus disclosure to steady partners. After adjusting for demographic variables, attitudes towards disclosure, having an HIV-positive partner, living with partner, and longer relationships were significantly associated with reported disclosure using multivariable logistic regression analysis. Living with partner was negatively associated with partner concurrency. However, having an HIV-positive partner, sex under the influence of drugs or alcohol, and experiencing physical aggression by a steady partner were negatively associated with consistent condom use. Interventions supporting PLHIV to safely and voluntarily disclose to partners may be an effective prevention approach between steady partners, however addressing partner violence and substance use are important considerations for future work.

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## Keywords

HIV; disclosure; sexual risk behaviour; steady partner; Brazil

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## Introduction

Recent advances in prevention strategies such as using treatment as prevention and pre-exposure prophylaxis sheds new light on the importance of HIV transmission dynamics within the context of ongoing sexual partnerships (Baeten et al., 2012; Cohen et al., 2011). Framing prevention efforts around couple-centred approaches among people living with HIV (PLHIV) with ongoing sexual partners may be an effective way to enhance current efforts (Burton, Darbes, & Operario, 2010; Grabbe & Bunnell, 2010).

An important consideration for couple-centred interventions is the ability for PLHIV to safely and voluntarily disclose their HIV status to their partners (GNP+ & UNAIDS, 2009). Serostatus disclosure is a multidimensional process which take place within complex social and relationship contexts. It is a key component of HIV prevention as it may encourage couples to adopt safer sexual practices and facilitate partners and family members to seek counselling and testing themselves (Tonwe-Gold et al., 2009). Disclosure has been associated with improvements in overall psychosocial well-being such as increase of self-esteem and social support as well as adherence to antiretroviral therapy (ART) and retention in care (Kalichman, DiMarco, Austin, Webster, & DiFonzo, 2003; Simon, Mason, & Marks, 1997; Stirratt et al., 2006; Wohl et al., 2011; Zea, Reisen, Poppen, Bianchi, & Echeverry, 2005). However, negative consequences of disclosure such as stigmatization, rejection by partners, verbal and physical threats and assaults have also been reported (Gielen, O'Campo, Faden, & Eke, 1997; Kalichman et al., 2003). These divergent outcomes reflect the complex interactions of individual, partner, and social-level factors that likely influence the decision on when, how, and to whom PLHIV may choose to disclose their HIV status (Obermeyer, Bajjal, & Pegurri, 2011).

Although one mathematical model estimates that disclosure may reduce the risk of HIV transmission (Pinkerton & Galletly, 2007), studies examining the relationship between disclosure and protective sexual behaviours such as condom use have been conflicting (Farquhar et al., 2004; King et al., 2008; Nöstlinger et al., 2010; Obermeyer et al., 2011; Protopopescu et al., 2010; Simoni & Pantalone, 2004). Factors that influence disclosure to partners such as the length of time in a relationship (Duru et al., 2006), type of partnership (O'Brien et al., 2003), and knowledge of a partner's HIV status (Deribe, Woldemichael, Wondafrash, Haile, & Amberbir, 2008) suggest that partner and relationship characteristics are important in the disclosure process. Other studies have shown high rates of unprotected sexual intercourse with main partners (Bouhnik, Préau, Lert, et al., 2007; Hoff, Chakravarty, Beougher, Neilands, & Darbes, 2012; Kalichman, Rompa, Luke, & Austin, 2002) and with partners who are HIV-positive (Bouhnik, Préau, Schiltz, et al., 2007; Weinhardt et al., 2004), which may be further confounded by other behavioural risk factors such as alcohol/substance use (Bouhnik, Préau, Lert, et al., 2007; Skurnick, Abrams, Kennedy, Valentine, & Cordell, 1998). These findings suggest that the relational contexts within which PLHIV

must consider disclosure may influence behaviours within partnerships, particularly around sexual practices.

Brazil's National STD and AIDS Program, lately renamed as the Department of STD, AIDS and Viral Hepatitis (Brazil Ministry of Health, BMoH), has been widely recognized for its effectiveness in controlling the epidemic spread of HIV (Okie, 2006). Brazil was the first middle-income country to guarantee universal access to antiretroviral medications (Nunn, da Fonseca, Bastos, Gruskin, 2009). As of the 1<sup>st</sup> of December, 2013, the BMoH launched its integrated strategy of enhanced access to ART offering early treatment at no cost at the point of delivery to all individuals living with HIV irrespective of immunologic status or viral load (UNAIDS 2013). However, despite these achievements, reducing the incidence of HIV remains an ongoing pursuit, particularly among populations at heightened risk of infection (Malta et al., 2010). The success of strategies to reach those at most risk is critical to the concerted efforts to curb the epidemic, as recently demonstrated by a cross-national modelling study (Wirtz et al., 2014).

Although encouraging disclosure to sexual partners may be an important component of prevention, the possibility of negative consequences has important implications in the care of PLHIV. The vast majority of the literature around disclosure comes from high-income countries, while those studies from low- and middle-income countries primarily focus on sub-Saharan Africa (Obermeyer et al., 2011). There is a need to understand the factors that influence safe disclosure to sexual partners in Brazil. In this cross-sectional study, we examined individual and relational factors motivating disclosure and their associated roles in sexual behaviours such as condom use and concurrent sexual partnerships among PLHIV in Rio de Janeiro, Brazil. While recognizing that disclosure is a relational phenomenon which takes place within larger sociocultural contexts, this paper analyses this complex issue from the perspective of individual interviewees.

## Methods

### Study Setting

The study was conducted in 6 key public health facilities managed by the Rio de Janeiro Health Secretariat in Brazil. These municipal primary care centres are directed by local medical leadership teams with treatment protocols based on guidelines regularly updated by the BMoH.

### Study Design and Participants

This was a sub-analysis within a larger study led by the Oswaldo Cruz Foundation (FIOCRUZ) in partnership with the Johns Hopkins Bloomberg School of Public Health to investigate psychosocial and structural factors associated with sexual health and well-being of PLHIV in Rio de Janeiro. Participants were recruited and enrolled between August 2008 through July 2009. Eligible participants were: 18 years of age or older, confirmed HIV-positive status, receiving HIV care at one of the 6 public health centres, and able to consent and participate in interviews. The questionnaire was administered face-to-face by trained interviewers in private rooms. No identifying information from participants was included in

the dataset used for analysis. The research protocols were reviewed and approved by the Institutional Review Boards of FIOCRUZ and the Municipal Health Secretariat in Rio de Janeiro.

## Measures

**Demographic Characteristics**—Variables included in the analysis were: age, gender, sexual orientation, highest level of education, current employment status, and participant's ART status.

**Relational Characteristics**—*Steady partner* was defined as a partner with whom the participant was in a 'dating, courtship, marriage, or other relationship implying involvement and commitment' over the last 6 months.

**Relationship characteristics**—To characterize the relationship with the steady partner, we assessed the length of the relationship, the partner's HIV status, and the living arrangement with the partner.

**Substance use and sexual behaviours within partnership**—A dichotomized variable was created from the item 'How often do you and/or your partner have sex under the influence of alcohol and/or drugs?' (Never, Yes) to assess substance use and sexual behaviours.

**Verbal and physical aggression within partnership**—To assess relational vulnerability, responses to the following questions were dichotomized (Never, Yes) to create variables for ever having experienced verbal aggression or physical aggression by the steady partner: 'Have you and your partner ever had an argument where he/she cursed, verbally assaulted you and made you feel very badly' and 'Have you and your partner ever had an argument where he/she hit, slapped, or physically hurt you?'.

**Social Support**—Although not specific to steady relationships, social support was included as an important component of the conceptual model for disclosure (Antelman et al., 2001; Smith, Rossetto, & Peterson, 2008). Using a 5-point scale ranging from 'Always' to 'Never', the following nine items from the Medical Outcome Study Social Support Survey (Sherbourne & Stewart, 1991), which has been validated in Brazil (Griep, Chor, Faerstein, Werneck, & Lopes, 2005), and four additional questions to strengthen tangible support were used to create an aggregate social support score: Someone 'to confide in or talk to about yourself or your problems'; 'to take you to the doctor if you needed'; 'to help with daily chores if you were sick'; 'to prepare your meals if you weren't able'; 'to help you if you were confined to bed'; 'who shows you love and affection'; 'who makes you feel wanted'; 'to have a good time with'; 'to get together with for relaxation'; 'to help get medicine'; 'to give you a place to stay'; 'to give you money'; and 'In general, how satisfied are you with the overall support you get from your friends and family members'. The scale ranged from a minimum of 13 to a maximum of 65 (Cronbach's alpha of 0.88).

**Attitudes Towards Disclosure**—A 6-item measure assessed comfort with disclosure using a 4-point Likert scale from 'Strongly Disagree' to 'Strongly Agree' for the following:

'I think it is important that close friends know I am HIV positive' ; 'I think it is important that people who I have sex with know that I am HIV positive'; 'I feel comfortable talking to others about my HIV status' ; 'I am afraid that others will not accept me if I tell them I am HIV-positive'; 'I'd rather not have romantic relationships to avoid telling people that I am HIV-positive'; 'I think it is important that members of my family know that I am HIV positive'. Responses were reversed where appropriate and aggregated to create an overall score for disclosure comfort, with higher numbers reflecting greater comfort (Cronbach's alpha 0.61, range 6–24).

**HIV Serostatus Disclosure**—A dichotomized variable was created to indicate 'Yes, my partner knows my status' or 'No/unsure if my partner knows my status' using the item: 'Does this steady partner know that you are HIV positive?'.

**Sexual Behaviours**—Two dichotomous outcomes for condom use were created: condom use at last sex (Yes, No/Unknown) and consistent condom use in the past 6 months (Always, Not Always) with steady partners. Sexual concurrency was assessed by asking 'Have you had another partner in the last six months while you have been with your current partner?' (Yes, No).

## Analysis

Descriptive analysis was performed to characterize the demographic features of the study population. Bivariate associations with HIV serostatus disclosure were assessed using chi-square (for categorical variables) and t-tests (for continuous variables) for all relational variables and the disclosure comfort scale. Bivariate logistic regression was then performed to determine unadjusted odds ratios (OR) for HIV serostatus disclosure. Independent variables with p-values less than 0.25 and those considered potential confounders were included in a multivariable regression model to assess the adjusted associations between the relational variables of interest and disclosure comfort with serostatus disclosure. Model fit was assessed using the Hosmer-Lemeshow statistic p-value (0.24).

Additionally, among those reporting sexual activity with their steady partners, bivariate associations between all relational variables and disclosure was assessed for the three sexual behaviour outcomes: condom use at last sex, consistent condom use, and sexual concurrency. Multivariable logistic regression models were constructed for each of the sexual behaviour outcomes using the same criteria described above. The Hosmer-Lemeshow goodness-of-fit p-values for the 3 sexual behaviour outcomes were 0.46, 0.72, and 0.92, respectively. Data were analysed using the statistical software SPSS 20.

## Results

### Sample Characteristics

In this sub-analysis, 493 individuals reported being in a steady partnership. Responses from transgendered individuals were excluded due to small numbers (n=4). Socio-demographic characteristics of the study population are presented (Table 1). The median age was 40 years (range 18–67 years). Approximately two-thirds of the sample were male (65%), 66%

heterosexual, and 72% were on ART. Only 16% had completed university or higher and 59% were employed at the time of the survey.

In terms of relational characteristics, nearly 70% of the participants reported living with their steady partners, with a median relationship length of 6 years (range 0–34 years). Less than half (41%) reported knowing their steady partner's HIV status. With regards to partner aggression, 48% of the participants reported ever being verbally assaulted and 18% were ever physically assaulted by their steady partner. Among those who reported having sex with their steady partners (n=460), 22% reported having sex under the influence of drugs or alcohol with their steady partner.

### **HIV Serostatus Disclosure to Steady Partner**

Serostatus disclosure was reported by 86% of the participants. Chi-square and t-tests (Table 1) revealed significant associations between disclosure and all relational variables. In bivariate logistic regression analyses with HIV serostatus disclosure (Table 2), participants reporting higher disclosure comfort (OR 1.1; 95% confidence interval (CI) 1.07–1.22) and social support (OR 1.0; CI 1.00–1.05) had slightly higher odds of disclosure. Individuals with known HIV-positive partners (OR 14.4; CI 5.14–40.13), living with their partner (OR 5.6; CI 3.27–9.58), and longer relationships were also more likely to disclose; however experiencing verbal (OR 2.9; CI 1.65–5.05) or physical aggression (OR 17.6; CI 2.40–128.26) by a steady partner was associated with disclosure.

After adjusting for demographic features, the relational variables that remained independently associated with disclosure were having an HIV-positive steady partner (adjusted OR (aOR) 10.0; CI 3.03–32.78), living with partner (aOR 2.2; CI 1.05–4.56), and longer relationships, especially after 5 years (aOR 12.0; CI 3.26–44.34) and 10 years (aOR 10.9; CI 3.56–33.57) (Table 2). Disclosure comfort also remained associated with disclosure (aOR 1.2; CI 1.05 –1.26). Partner aggression and sex under the influence of drugs or alcohol were not significantly associated with serostatus disclosure in the multivariable model.

Additionally, to explore possible gender differences regarding patterns of disclosure in relation to partner aggression and substance use, we performed a sub-analysis among women. Although the small sample size precludes multivariable analysis, sex under the influence of drugs and alcohol was associated with a decreased likelihood of disclosure (OR 0.27; CI 0.11–0.65) whereas women who ever experienced verbal aggression were more likely to report disclosure (OR 3.57; CI 1.54–8.28). All of the women who reported ever experiencing physical aggression (n=32) reported disclosure to partners.

### **HIV Serostatus Disclosure and Condom Use**

Disclosure status was not associated with condom use at last sex or consistent condom use in this study population (Table 3). However, having an HIV-positive steady partner (aOR 0.2; CI 0.12–0.38 and aOR 0.4; CI 0.24–0.62) and ever having sex under the influence of drugs or alcohol (aOR 0.5; CI 0.25–0.83 and aOR 0.5; CI 0.25–0.83) remained negatively associated with condom use (condom use at last sex and consistent condom use, respectively). Consistent condom use was also less likely among those reporting physical aggression by a steady partner (aOR 0.5; CI 0.25 – 0.81), whereas individuals in

relationships of 10 years or greater were more likely to report condom use at last sex (aOR 3.5; CI 1.40–8.59) (Table 3).

### **HIV Serostatus Disclosure and Concurrent Sexual Partners**

Although reporting concurrent sexual partners was negatively associated with disclosure and longer relationships and positively associated with sex under the influence of drugs or alcohol on bivariate analyses, these associations did not persist after controlling for demographic and other relational variables (Table 3). However, those living with a steady partner (aOR 0.5; CI 0.27–0.85) were less likely to report concurrent sexual partnerships in the multivariate analysis.

## **Discussion**

In this study, we examined the relational characteristics associated with HIV serostatus disclosure and sexual behaviours for PLHIV in steady partnerships under follow-up in 6 municipal clinics from Rio de Janeiro, Brazil. Overall, the proportion of disclosure in this sample was high (85.7%), consistent with what has been reported in the literature across contexts (Obermeyer et al., 2011). We found several relational characteristics that were strongly associated with disclosure including nearly a 10-fold increase in the odds of disclosure if participants reported a steady partner that was HIV-positive, 2-fold increase if living with their steady partner, and 4 to 13-fold increase in the odds of disclosure with relationship lengths greater than 2 years. The self-reported degree of comfort with disclosure was associated with disclosure and may be important to understanding motivations for disclosure in steady partnerships, however additional work to characterize and measure attitudes towards disclosure are necessary.

These findings support prior literature from Brazil and across other contexts which have demonstrated an increased likelihood for HIV serostatus disclosure within steady partnerships (Paiva, Segurado, & Filipe, 2011; Suzan-Monti et al., 2011; Vu et al., 2012). Types of partner relationships are important in the dialogue around disclosure (Duru et al., 2006; Niccolai, King, D'Entremont, & Pritchett, 2006; Przybyla et al., 2013), and steady partnerships may represent more stable relationships with decreased stigma and fear, all characteristics which can promote disclosure (Paiva et al., 2011; Pulerwitz, Michaelis, Lippman, Chinaglia, & Díaz, 2008; Silva & Ayres, 2009). Although we did not specifically examine the role of stigma and disclosure, several studies have previously been published regarding the correlations between stigma and non-disclosure (Przybyla et al., 2013; Simbayi et al., 2007; Smith et al., 2008). Defining the relational characteristics of steady partnerships that may support or hamper disclosure contributes to a better understanding of the contexts around partner disclosure and provides programs an opportunity to identify areas of support between PLHIV and their partners, such as initiatives aimed at decreasing intimate partner violence (IPV), a serious consequence of disclosure in some partnerships/communities. Although no systematic reviews have assessed interventions aimed at reducing IPV in the context of HIV serostatus disclosure to the best of our knowledge, a recent review by Bair-Merritt et al. demonstrated that interventions in the primary health care setting can reduce IPV (Bair-Merritt et al., 2014). This may provide useful lessons to healthcare

practitioners delivering care to vulnerable populations, such as those assessed by our study. We did not find disclosure to be associated with a history of partner aggression or sex under the influence of drugs or alcohol, although these variables were independently associated with HIV risk behaviours in our study. Prior studies have shown an association between fearing or experiencing partner violence with non-disclosure, but most of these studies focused on women (Gielen et al., 1997; Kendall et al., 2012; Kumar, Waterman, Kumari, & Carter, 2006; Makin et al., 2008). While there are some barriers and motivators for partner disclosure that are universal to all PLHIV, gender-based differences in motivations regarding HIV serostatus disclosure are likely (Deribe et al., 2008; Koenig & Moore, 2000). Although the sub-analysis of women in our study was not conclusive, bivariate analysis suggests that women who reported partner disclosure are at higher risk of reporting physical and verbal aggression, and women who reported having sex under the influence use drugs or alcohol were less likely to disclose.

When looking at factors associated with sexual behaviours, we found that disclosure status did not remain associated with any of the sexual behaviour outcomes. Studies to elucidate the relationship between disclosure and sexual behaviours have been mixed and likely reflect the different individual characteristics and relational dynamics that influence the decision to practice protective sexual behaviours between couples among the various subpopulations represented (Obermeyer et al., 2011).

Among the relational characteristics we examined, individuals reporting a relationship length of 10 years or greater were almost 3.5 times more likely to report condom use at last sex, consistent with previous studies (Guimarães, Boschi-Pinto, & Castilho, 2001). Condom use was less likely among those with steady partners who were also HIV-positive which have been seen in other studies among HIV sero concordant partners (Marks, Richardson, & Maldonado, 1991; Simoni & Pantalone, 2004). We also found that condom use was less likely among those who reported having sex under the influence of drugs and alcohol, which supports prior studies demonstrating the negative impact of substance use on sexual protective behaviours (Bouhnik, Préau, Lert, et al., 2007; Skurnick et al., 1998), and those experiencing physical aggression by a steady partner. These findings support the importance of understanding the relational context within which PLHIV must navigate the perceived risks and benefits around disclosure and may explain why we did not find an association between disclosure and sexual behaviours in our study. This underlines the importance of developing broad-based interventions that recognize the relational characteristics influencing serostatus disclosure and safer sexual behaviours within steady partnerships.

In terms of concurrent sexual partners, our study found that the only relational variable associated with sexual concurrency was whether an individual reported living with their steady partner. This most likely represents the different relationship processes that influence sexual concurrency compared to those that influence condom use (Eaton & van Der Straten, 2009; Grieb, Davey-Rothwell, & Latkin, 2012).

There are several limitations to this study. First, given the cross-sectional design, we are unable to establish temporal relationships between serostatus disclosure and outcomes of sexual protective behaviours and therefore causality cannot be determined. Additionally,



despite efforts to train study staff and assure confidentiality for participants, the self-reported responses are likely to be subject to recall and social desirability bias as the surveys were administered using face-to-face interviews. Thirdly, because partner data was not collected, we were unable to assess dyadic information. However, despite these limitations, this study is among the first to explore relational factors that influence partner disclosure in Brazil and will inform future work to further elucidate the motivations and processes around disclosure in steady partnerships.

In conclusion, our study brings new information about the importance of approaching prevention efforts within partnerships in the context of public health centres from a middle-income country. In this sense, it provides information distinct from prior Brazilian studies which have been carried out in tertiary referral centres, and differs from studies carried out in Sub-Saharan Africa and high-income countries. This study highlights the need to further investigate the relational contexts in which PLHIV make decisions around disclosure and its impact on sexual protective behaviours. Future studies should explore factors that may contribute to an individual's level of disclosure comfort and relational features that may support or interfere with subsequent sexual protective behaviours, particularly in sero discordant or unknown partner concordant relationships. Interventions to support PLHIV to safely and voluntarily disclose to partners may still be important and effective strategies to prevent HIV transmission between steady couples, despite conflicting findings from the literature regarding the association of disclosure and behavioural change. Relational concerns such as physical aggression and substance use are important considerations for future work.

Analysis based on interviewees' individual answers constitute an essential, but by no means exclusive, source of information on the complex processes of living with HIV and sharing it with a close partner, family and friends, and sometimes society at large. Although PLHIV in countries with proper care and full access to ART now have substantially extended and healthier lives, in the face of multiple forms of persisting social stigma and discrimination, facilitating disclosure is likely to remain on the agenda of HIV prevention and sexual and reproductive health for the foreseeable future.

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**Table 1**

Baseline Characteristics of Sample and Bivariate Associations for Disclosure to Steady Partner

|  | Study Population<br>N (% or SD) | Disclosure to Steady Partner (N=489) |                          | p-value |
|--|---------------------------------|--------------------------------------|--------------------------|---------|
|  |                                 | Yes<br>N (%) or Mean (SD)            | No<br>N (%) or Mean (SD) |         |
| <b>Individual Characteristics</b>                  |                                 |                                      |                          |         |
| <b>Gender</b>                                      |                                 |                                      |                          |         |
| Male   | 318 (65.0)                      | 280 (88.1)                           | 38 (11.9)                | 0.057   |
| Female   | 171 (35.0)                      | 139 (81.3)                           | 32 (18.7)                |         |
| <b>Age</b> (range 18–67 years)                     | 39.8 (9.1)                      | 39.5 (9.0)                           | 41.7 (9.7)               | 0.065   |
| <b>Highest level of education</b>                  |                                 |                                      |                          |         |
| Primary school or below                            | 219 (44.8)                      | 192 (87.7)                           | 27 (12.3)                | 0.142   |
| Secondary  | 190 (38.9)                      | 164 (86.3)                           | 26 (13.4)                |         |
| University or higher                               | 80 (16.4)                       | 63 (78.8)                            | 17 (21.3)                |         |
| <b>ART status</b>                                  |                                 |                                      |                          |         |
| On ART   | 350 (71.6)                      | 305 (87.1)                           | 45 (12.9)                | 0.188   |
| Not on ART   | 139 (28.4)                      | 114 (82.0)                           | 25 (18.0)                |         |
| <b>Sexual Orientation</b>                          |                                 |                                      |                          |         |
| Heterosexual                                       | 324 (66.3)                      | 283 (87.3)                           | 41 (12.7)                | 0.339   |
| Homosexual   | 137 (28.0)                      | 113 (82.5)                           | 24 (17.5)                |         |
| Bisexual   | 28 (5.7)                        | 23 (82.1)                            | 5 (17.9)                 |         |
| <b>Current employment</b>                          |                                 |                                      |                          |         |
| Employed   | 287 (58.7)                      | 241 (84.0)                           | 46 (16.0)                | 0.247   |
| Unemployed   | 202 (41.3)                      | 178 (88.1)                           | 24 (11.9)                |         |
| <b>Relational Characteristics</b>                  |                                 |                                      |                          |         |
| <b>Living with partner</b>                         |                                 |                                      |                          |         |
| Yes  | 342 (69.9)                      | 317 (92.7)                           | 25 (7.3)                 | <0.001  |
| No   | 147 (30.1)                      | 102 (69.4)                           | 45 (30.6)                |         |
| <b>Steady Partner with HIV</b>                     |                                 |                                      |                          |         |
| Yes  | 199 (40.7)                      | 195 (98.0)                           | 4 (5.7)                  | <0.001  |
| No or Unknown                                      | 290 (59.3)                      | 224 (77.2)                           | 66 (22.8)                |         |
| <b>Relationship Length</b>                         |                                 |                                      |                          |         |
| Less than 2 years                                  | 104 (21.3)                      | 63 (15.0)                            | 41 (39.4)                | <0.001  |
| 2–4.99 years                                       | 112 (22.9)                      | 94 (83.9)                            | 18 (16.1)                |         |
| 5–9.99 years                                       | 108 (22.1)                      | 104 (96.3)                           | 4 (3.7)                  |         |
| 10 years and greater                               | 165 (33.7)                      | 158 (95.8)                           | 7 (4.2)                  |         |
| <b>Social Support</b>                              | 53.9 (10.38)                    | 54.3 (10.2)                          | 51.3 (11.0)              | 0.029   |
| <b>Sex under the influence of drugs or alcohol</b> |                                 |                                      |                          |         |
| Yes  | 107 (21.9)                      | 82 (76.6)                            | 25 (23.4)                | 0.010   |
| Never  | 353 (72.2)                      | 312 (88.4)                           | 41 (11.6)                |         |
| Not applicable                                     | 29 (5.9)                        | 25 (86.2)                            | 4 (13.8)                 |         |
| <b>Verbal Aggression</b>                           |                                 |                                      |                          |         |

|                            | Study Population<br>N (% or SD) | Disclosure to Steady Partner (N=489) |                          | p-value |
|----------------------------|---------------------------------|--------------------------------------|--------------------------|---------|
|                            |                                 | Yes<br>N (%) or Mean (SD)            | No<br>N (%) or Mean (SD) |         |
| Yes                        | 236 (48.3)                      | 217 (91.9)                           | 19 (8.1)                 | <0.001  |
| No                         | 253 (51.7)                      | 202 (79.8)                           | 51 (20.2)                |         |
| <b>Physical Aggression</b> |                                 |                                      |                          |         |
| Yes                        | 86 (17.6)                       | 85 (98.8)                            | 1 (1.2)                  | <0.001  |
| No                         | 403 (82.4)                      | 334 (82.9)                           | 69 (17.1)                |         |
| <b>Disclosure Comfort</b>  | 14.2 (4.3)                      | 14.6 (4.2)                           | 12.3 (4.5)               | <0.001  |

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**Table 2**

Bivariate and Multivariate Logistic Regression of Relational Characteristics and Level of Disclosure Comfort in Relation to Disclosure to Steady Partner

|  | Partner Knows Status       |                  |                           |                  |
|--|----------------------------|------------------|---------------------------|------------------|
|  | OR (95% CI)                | p                | aOR (95% CI)              | p                |
| <b>Disclosure Comfort</b>                          | <b>1.14 (1.07;1.22)</b>    | <b>&lt;0.001</b> | <b>1.12 (1.03;1.22)</b>   | <b>0.008</b>     |
| <i>Relational Context</i>                          |                            |                  |                           |                  |
| <b>Steady Partner with HIV</b>                     |                            |                  |                           |                  |
| Yes  | <b>14.36 (5.14;40.13)</b>  | <b>&lt;0.001</b> | <b>9.96 (3.03–32.78)</b>  | <b>&lt;0.001</b> |
| No or Unknown                                      | Ref.                       |                  | Ref.                      |                  |
| <b>Living with Partner</b>                         |                            |                  |                           |                  |
| Yes  | <b>5.59 (3.27; 9.58)</b>   | <b>&lt;0.001</b> | <b>2.19 (1.05;4.56)</b>   | <b>0.037</b>     |
| No   | Ref.                       | Ref.             |                           |                  |
| <b>Relationship Length</b>                         |                            |                  |                           |                  |
| Less than 2 years                                  | Ref.                       |                  | Ref.                      |                  |
| 2–4.99 years                                       | <b>3.40 (1.79;6.44)</b>    | <b>&lt;0.001</b> | <b>3.86 (1.69;8.78)</b>   | <b>0.001</b>     |
| 5–9.99 years                                       | <b>16.92 (5.79;49.49)</b>  | <b>&lt;0.001</b> | <b>12.01 (3.25;44.34)</b> | <b>&lt;0.001</b> |
| 10 years or more                                   | <b>14.69 (6.35;34.47)</b>  | <b>&lt;0.001</b> | <b>10.93 (3.56;33.57)</b> | <b>&lt;0.001</b> |
| <b>Social Support</b>                              | <b>1.03 (1.00; 1.05)</b>   | <b>0.030</b>     | 1.01 (0.98;1.05)          | 0.380            |
| <b>Sex Under the Influence of Drugs or Alcohol</b> |                            |                  |                           |                  |
| Yes  | 0.53 (0.17; 1.65)          | 0.270            | 0.55 (0.11;2.70)          | 0.463            |
| Never  | 1.22 (0.40; 3.67)          | 0.727            | 0.94 (0.21;4.13)          | 0.932            |
| Not sexually active with partner                   | Ref.                       |                  | Ref.                      |                  |
| <b>Verbal Aggression by Partner</b>                |                            |                  |                           |                  |
| Yes  | <b>2.88 (1.65;5.05)</b>    | <b>&lt;0.001</b> | 1.52 (0.71;3.23)          | 0.280            |
| Never  | <b>Ref.</b>                |                  | Ref.                      |                  |
| <b>Physical Aggression by Partner</b>              |                            |                  |                           |                  |
| Yes  | <b>17.56 (2.40;128.26)</b> | <b>0.005</b>     | 7.68 (0.87;67.50)         | 0.066            |
| Never  | <b>Ref.</b>                |                  | Ref.                      |                  |

OR = unadjusted odds ratio; aOR = adjusted odds ratio after controlling for: Gender, Age, Education, ART status, and Employment

**Table 3**  
Bivariate and Multivariate Logistic Regression regarding Disclosure Status and Sexual Risk Behaviours

|  | Condom Used at Last Sex with Partner |                            | Consistent Condom Use with Partner |                            | Concurrent Sexual Partners |                          |
|--|--------------------------------------|----------------------------|------------------------------------|----------------------------|----------------------------|--------------------------|
|  | OR (95% CI)                          | aOR (95% CI)               | OR (95% CI)                        | aOR (95% CI)               | OR (95% CI)                | aOR (95% CI)             |
| <b>Disclosure Status</b>                           |                                      |                            |                                    |                            |                            |                          |
| Partner Knows                                      | 0.61 (0.29;1.28)                     | 0.72 (0.29;1.82)           | 0.80 (0.45; 1.42)                  | 1.01 (0.48;2.08)           | <b>0.42** (0.24;0.76)</b>  | 0.48 (0.22;1.05)         |
| Partner Does Not Know                              | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |
| <b>Relational Context</b>                          |                                      |                            |                                    |                            |                            |                          |
| <b>Steady Partner with HIV</b>                     |                                      |                            |                                    |                            |                            |                          |
| Yes  | <b>0.29*** (0.18;0.47)</b>           | <b>0.21*** (0.12;0.38)</b> | <b>0.42*** (0.28;0.63)</b>         | <b>0.39*** (0.24;0.62)</b> | 0.76 (0.46;1.34)           | 0.98 (0.55;1.77)         |
| No or Unknown                                      | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |
| <b>Living with partner</b>                         |                                      |                            |                                    |                            |                            |                          |
| Yes  | 1.00 (0.61;1.65)                     | 0.89 (0.48;1.67)           | 0.90 (0.59;1.38)                   | 0.89 (0.52;1.51)           | <b>0.34*** (0.21;0.55)</b> | <b>0.48* (0.27;0.85)</b> |
| No   | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |
| <b>Relationship Length</b>                         |                                      |                            |                                    |                            |                            |                          |
| Less than 2 years                                  | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |
| 2–4.99 years                                       | 0.95 (0.49;1.82)                     | 1.25 (0.58;2.70)           | 0.96 (0.55;1.70)                   | 1.04 (0.54;1.99)           | 0.62 (0.33;1.17)           | 0.76 (0.37;1.58)         |
| 5–9.99 years                                       | 1.12 (0.57;2.19)                     | 2.07 (0.88;4.90)           | 0.93 (0.55;1.66)                   | 1.15 (0.56;2.39)           | <b>0.41* (0.21;0.83)</b>   | 0.67 (0.28;1.60)         |
| 10 years or more                                   | 1.60 (0.83;3.09)                     | <b>3.47** (1.40;8.59)</b>  | 1.29 (0.75;2.23)                   | 1.56 (0.74;3.32)           | <b>0.39** (0.20;0.73)</b>  | 0.72 (0.31;1.65)         |
| <b>Sex under the influence of drugs or alcohol</b> |                                      |                            |                                    |                            |                            |                          |
| Yes  | <b>0.53* (0.32;0.87)</b>             | <b>0.46** (0.25;0.83)</b>  | <b>0.48** (0.31;0.75)</b>          | <b>0.48** (0.29;0.79)</b>  | <b>2.07** (1.24;3.44)</b>  | 1.52 (0.85;2.70)         |
| Never  | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |
| <b>Verbal Aggression by Partner</b>                |                                      |                            |                                    |                            |                            |                          |
| Yes  | <b>0.51** (0.32;0.82)</b>            | 0.75 (0.43;1.32)           | <b>0.51** (0.34;0.75)</b>          | 0.74 (0.47;1.17)           | 0.84 (0.52;1.34)           | 1.07 (0.61; 1.89)        |
| Never  | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |
| <b>Physical Aggression by Partner</b>              |                                      |                            |                                    |                            |                            |                          |
| Yes  | <b>0.36*** (0.21;0.62)</b>           | 0.54 (0.28;1.06)           | <b>0.32*** (0.20;0.53)</b>         | <b>0.45*** (0.25;0.81)</b> | 0.91 (0.48;1.71)           | 1.20 (0.56;2.56)         |
| Never  | Ref.                                 | Ref.                       | Ref.                               | Ref.                       | Ref.                       | Ref.                     |

OR = unadjusted odds ratio; aOR = adjusted odds ratio after controlling for: Gender, Age, Education, Sexual Orientation, ART status.



$p > 0.05$

\*

$p < 0.01$

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$p > 0.0001$

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