Published in final edited form as:

AIDS Behav. 2015 March ; 19(3): 553–560. doi:10.1007/s10461-014-0862-4.

HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners

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Abstract

Male couples represent a high priority group for HIV prevention interventions because primary partners have been identified as the source of one-third to two-thirds of HIV infections among MSM. HIV testing is an important component of the U.S National AIDS Strategy. In previous research rates of HIV testing among partnered MSM have been found to be lower compared to other MSM. In this paper, we use a sample of 906 MSM recruited through internet advertisements to contrast HIV testing behavior, perceived risk of HIV infection and confidence in remaining HIV sero-negative between single MSM and MSM who report having a main partner. We also examine associations between sexual agreements and HIV testing and perceived risk among partnered MSM. Although results were marginally significant, men with a main partner had significantly higher odds of perceiving zero risk of HIV infection, higher odds of being very confident they will remain HIV-negative, and lower odds of testing for HIV in the past 6 months. Partnered men who reported they were in an open relationship had higher odds of recent HIV testing, lower odds of perceiving zero risk, and lower odds of being very confident in remaining HIV-negative, relative to those who reported monogamy. The results point to the need for dyadic interventions to tackle the underestimation of potential risk associated low HIV testing among partnered MSM. Couples HIV Testing and Counseling – CHTC – affords male couples the opportunity to learn their sero-status together and discuss the realities of their agreement and relationship and should be considered a priority intervention for male couples in the U.S.

Introduction

Male couples represent a high priority group for HIV prevention interventions: men who have sex with men (MSM) account for the majority of HIV infections in the United States (1), and among MSM, one-third (2) to two-thirds (3) of HIV infections are estimated to occur within primary partnerships. High rates of sexual risk behavior for HIV (with primary and casual partners) (4, 5) and low rates of disclosure of episodes with casual partners to

one's primary partner have been documented among men in same-sex relationships (6, 7). Previous studies have also documented that partnered MSM are more likely to engage in unprotected anal intercourse (UAI) and to have more frequent sex with their main partners, increasing the number of exposure episodes within main partnerships (3, 5, 8). Each of these factors points towards the necessity of targeted HIV prevention interventions for male couples. In line with evidence that increasing men's awareness of their sero-status is associated with fewer risk behaviors and lower rates of HIV transmission (9, 10), HIV testing is an important component of the National AIDS Strategy (11). However, previous studies suggest that MSM with main partners report lower levels of routine HIV testing than single MSM (12). It is imperative to increase the rates of testing for MSM in relationships, both to strengthen the success of primary prevention as well as to improve the rates of early identification of new HIV infection and early treatment engagement.

MSM in relationships experience several conditions that are not present for single MSM and that may shape their perceived risk of HIV infection and influence decisions regarding HIV testing. In addition to a sense of protection conveyed by being in a relationship, the presence of sexual agreements with their primary partner influences sexual behavior within and outside of the relationship (5, 13). These agreements act as guidelines for mutually acceptable sexual behavior and often revolve around behavior aimed to keep them and their partners from becoming infected (7, 14). As such, partnered men may perceive themselves to be less at-risk for HIV (15). Second, when sexual agreements are broken, the break is often not disclosed to one's primary partner (6, 7, 13, 16). Bringing up the need to test for HIV may necessitate the disclosure of the broken agreement and may be seen as harmful to the relationship. In this situation, episodic exposures to potential HIV infection may not result in testing for the couple.

Illustrating the complexity of decisions to test among couples, previous work identified that, among a cohort of MSM in main partnerships, only 27% of men who had engaged in UAI with an HIV-positive or status unknown outside partner reported testing for HIV in the past three months (12). For nearly half of the men in the same group, more than 6 months had passed since their most recent HIV test, including 15% who had not been tested in over a year and 14% who had not been tested in over two years. When examining only concordant negative couples from the same sample, 44% of those reporting unprotected anal intercourse with an outside partner had not tested in the last six months and 32% had not tested for HIV in the past year (12). Among men who had not tested in the past year ($n=206$), 47% endorsed the response choice of "*I am in a relationship*" as a reason for their not having tested (unpublished data, Hoff). Similarly low testing rates have been found in other samples of MSM couples: a study of MSM couples in the Pacific Northwest found that fewer than 25% of men had been tested in the previous 3 months (15), and a nationwide study found that 19% of HIV-negative men in main partnerships had not been tested since their relationship began (17).

In this paper we describe differences in HIV risk perceptions and HIV testing behaviors between single MSM and MSM who report a current main partner, utilizing a web-based sample of 906 MSM drawn from across the U.S. The paper provides preliminary quantitative evidence of a perceived protective effect of relationship status on HIV risk

among MSM with main partners, and makes recommendations for the introduction of innovative dyadic interventions that dispel these myths and provide services tailored to the unique needs of male-male couples.

Data and Methods

Ethical approval for the study was provided by the Emory University IRB. Participants were recruited for a self-administered survey via Facebook. Over a 10 day period, banner ads were placed on Facebook, targeted to men who indicated an interest in men on their profiles and reported residency in the United States. Clicking on the advertisement led potential participants to information regarding the survey; after obtaining electronic informed consent, participants were invited to complete the survey. Being male, being over 18 years of age, and self-reporting having had sex with a man in the previous six months were requirements for eligibility. All surveys were conducted in English. Slightly over 400,000 men saw the advertisements and 4,638 clicked on the advertisement and were subsequently exposed to the survey. Of these, 1,739 (39%) consented to take the survey, and of those consenting, 37 were under 18 years old (2%), 15 reported a gender other than male (0.8%), 335 had not had sex with a man in the past 6 months (19%), 15 lived outside the US (0.8%), and 86 did not respond to one or more of the eligibility criteria (5%). This resulted in a total of 454 ineligible respondents, yielding a sample of 1,285 eligible men (74% of those who consented).

Participants were asked *“Do you currently have a main partner -- that is, someone you feel committed to above all others? You might call this person your boyfriend, partner, significant other, spouse, or husband.”* Twenty-seven participants (2%) who did not answer this question were dropped from analysis, as were 25 participants (2%) with missing data on race, age and education. An additional 253 participants (20%) who did not respond to questions about HIV testing behaviors were excluded from the analysis; this excluded sample did not differ significantly from the included sample on age, race or education. Lastly, participants who self-reported HIV-positive status (81, 6%) were dropped to focus on men at risk of infection. The result was a final analysis sample of 906 MSM.

To measure perceived risk of HIV infection, participants were asked two questions: *“On a scale from 1 to 10, with 1 being no risk and 10 being very high risk: How would you rate your risk for contracting HIV based on your current sex and drug use behaviors?”* (Perceived risk), and *“On a scale from 1 to 5, with 1 being no confidence and 5 being very high confidence: How confident are you that you can stay HIV-negative in your lifetime?”* (Confidence in ability to avoid HIV infection). Due to the skewed distribution of responses, these scales were dichotomized to distinguish participants who reported no perceived risk (37%) and those who indicated very high confidence in staying negative (53%) from all others. In addition to these questions on perceptions of risk, participants were asked to report on their most recent HIV testing experience and to indicate how they typically decide to get tested by selecting one or more responses from a list including, *“I get tested routinely,” “I get tested after I've had unprotected sex with someone whose HIV status is positive or unknown to me,”* or *“I get tested before/when I start having sex with a new partner.”* Stage one of the analysis uses multivariable logistic regression models to examine differences in

perception of risk, confidence in remaining negative and recent (<6 months) HIV testing behaviors between single men and men who report a main partner.

Stage two of the analysis examines associations between sexual agreements and recent HIV testing behaviors, perception of risk and confidence in remaining negative, and is restricted to men with a main partner who reported a relationship duration of at least 12 months (n=314). As in stage 1, these associations were analyzed through multivariable logistic regression models. Men who reported a main partner were asked if they had an agreement with their partner around sex: *“Many couples have an understanding, expectation or agreement about the ground rules regarding sex with outside partners. Which of the following best describes the current agreement you and your main partner have about sex outside of the relationship: none (we do not have an agreement), monogamous (neither of us can have sex with an outside partner), or open (we can have sex with outside partners, but with some conditions or restrictions)”* or *“we can have sex with outside partners without any conditions or restrictions”*). A key covariate for this analysis is experience of intimate partner violence (IPV): Participants were asked about the experience of IPV with their main partner in the last 12 months, with separate questions for physical, sexual or emotional violence. Each of the regression models in both stages of analysis also includes as a priori controls a set of variables that have been associated with HIV testing, HIV infection and sexual agreements: age (18-20), race (20, 21), education (18, 20, 21), employment status (21) and relationship duration (13). Interactions were evaluated between each of the control variables and relationship status in Stage One and between the controls, relationship status, and agreement type in Stage Two. Wald tests of the interaction coefficients were conducted, and non-significant ($\alpha=0.05$) product terms were dropped from the final models.

Results

The analysis sample was predominantly non-Hispanic white (78%), and 42% were in the age group 18 to 24. Approximately 40% had college level education or higher, and the majority (54%) reported being fully employed (although 23% reported being unemployed) (Table 1). Less than 3% reported a sexual orientation other than gay. In terms of HIV testing behaviors, 34% of the sample reported having tested within the past 6 months, and 51% of those who reported having ever tested indicated that they test routinely at least once per year. Only 25% of those who had ever tested reported that they seek testing before or when starting to have sex with a new partner.

Men with a main partner were more likely to report that they perceive zero personal risk of HIV infection (single MSM 24%, partnered MSM 48%; chi-square 56.1, df 1, $p<0.001$) and that they are very confident that they will stay HIV-negative throughout their lifetime (single MSM 46%, partnered MSM 58%; chi-square 12.7, df 1, $p<0.001$) (Table 1). Partnered men also reported lower rates of HIV testing in the last 6 months than did single men (32% and 37%, respectively), although this difference was only marginally significant only at $\alpha=0.10$ (chi-square 3.4, df 1, $p=0.07$). Testing patterns and cues to testing were largely similar by relationship status, except that partnered men were less likely to report UAI with a partner of unknown or positive sero-status as a factor influencing their decision to test (single MSM 20%, partnered MSM 14%; chi-square 4.4, df 1, $p=0.04$). At the $\alpha=0.10$ level, partnered

men were also marginally less likely to report testing whenever the opportunity arises (single MSM 23%, partnered MSM 18%; chi-square 3.0, df 1, $p=0.08$). When controlling for age, race, education, and employment, having a main partner remained associated with perceiving zero risk of HIV infection [odds ratio (OR) 3.2, $p<0.001$] and with being very confident in staying HIV-negative (OR 1.7, $p<0.001$) (Table 2). The odds of testing for HIV in the past 6 months also remained marginally lower ($\alpha=0.1$) among partnered men in the adjusted model (OR 0.8, $p=0.09$). No interactions emerged as significant.

Turning to focus on intragroup differences among men who reported having a main partner, 48% reported being with their partner for 2-7 years, 62% reported they were in a monogamous relationship, and 33% reported experiencing any IPV (including 28% reporting any form of psychological IPV, 5% reporting sexual IPV, and 15% reporting physical IPV) (Table 3). Adjusting for other covariates, men with college or higher education reported significantly greater odds of HIV testing within the past 6 months than those with high school or less education (OR 3.8, $p=0.003$) (Table 4). Relative to men who reported they were in a monogamous relationship, men in an open relationship had significantly greater odds of reporting having tested for HIV in the past 6 months (OR 2.9, $p=0.001$), and they had significantly lower odds of perceiving zero personal HIV risk (OR 0.1, $p<0.001$) and of reporting high confidence in remaining HIV-negative (OR 0.4, $p<0.001$). Men with no sexual agreement with their partner were also marginally less likely ($\alpha=0.1$) to report high confidence in remaining HIV-negative than men in a monogamous relationship (OR 0.4, $p=0.07$). Men who reported experiencing IPV in the past 12 months had lower odds of perceiving zero HIV risk (OR 0.5, $p=0.01$) and, at $\alpha=0.10$, marginally lower odds of being very confident that they would remain HIV-negative (OR 0.6, $p=0.06$), relative to men who did not report experiencing IPV. Relationship duration was not associated with HIV testing or perceptions of risk, but men in longer relationships had more than twice the odds of reporting high confidence that they would remain HIV-negative compared to men in relationships of less than 2 years (OR 2.3, $p=0.01$ for men in relationships of 2-7 years; OR 2.4, $p<0.05$ for men in relationships of 7 or more years).

Discussion

The results provide preliminary quantitative evidence that MSM with main partners have lower perceptions of risk and increased confidence in remaining HIV negative. Although many of the results are marginally significant, the data suggest that partnered MSM are less likely to test frequently. Together, these results indicate that partnered MSM may underestimate the need for regular testing as a result of perceiving low risk from sexual behaviors within their relationship. This underestimate is likely in part shaped by the overemphasis of HIV prevention efforts targeting MSM on the risk of casual sex for HIV infection, prompting men in relationships to perceive that as being protective.

Mitchell et al., (2012) argue that partnered MSM often participate in UAI as way to show their love, intimacy, and trust toward one another (19), as well as for strengthening their relationship commitment and satisfaction (7). The same trust and desire for intimacy within a relationship also shapes the willingness to test for HIV; raising the need for an HIV test to a main partner may be seen as an indication of a broken agreement or be interpreted as a

sign of distrust of a partner. Lower levels of testing among partnered MSM are particularly worrying in the context of previous evidence demonstrating that MSM in relationships generally have low rates of discussion of HIV testing or sero-status (22, 23), resulting in lack of condom use with main partners based on trust in sexual monogamy.

There is ample evidence demonstrating that some MSM couples utilize sexual agreements as a prevention strategy to reduce their HIV risk (24-27). One such agreement is *negotiated safety*, in which perceived HIV-negative sero-concordant male couples practice UAI within their relationship as long as both partner's sero-status remains HIV-negative and both men practice safer sex with secondary partners. However, the success of negotiated safety is dependent on routine HIV testing to ensure both partners remains sero-negative. Testing for HIV could indicate the occurrence of a broken agreement that may have constituted a potential exposure to HIV; men in relationships may opt not to test to avoid the concomitant need to disclose the incident, which could be seen as threatening to the relationship. Data indicate that less than half of broken agreements are disclosed (6, 7, 13).

The results presented here highlight a complex relationship between agreements and HIV testing among partnered MSM; relative to men who reported they were in a monogamous relationship, men in an open relationship were more likely to have tested recently for HIV, perceive themselves to be at risk of HIV infection and report lower confidence in remaining HIV-negative. The open relationship category may include a whole range of agreement types, from those with clearly established and adhered-to conditions regarding sex outside of the relationship to no-questions-asked open relationships. As such, some of the men in this category may be correctly identifying themselves as at greater risk of HIV infection and be acting appropriately in routine testing for HIV. Additionally, we were not able to control for the number of outside sex partners among those with different types of sexual agreements: this has obvious implications for both perceptions of risk and HIV testing behavior. Future research should include more detailed categories of sexual agreements, and behaviors specific to each agreement type. Further data on the types of open relationships are needed to clarify the relationship between agreement type and testing behavior. More worrying, however, are the lower levels of testing among the majority of partnered men who perceive themselves as monogamous. Men in this group may have varying definitions of monogamy; some men may consider oral sex, sex outside of the home city, or group sex to be permissible, and thus may be at risk of HIV infection from outside the relationship. Desires for trust within the relationship or fears of relationship dissolution act as significant barriers to the discussion of actual HIV risks and thus lead to an underestimate of the need for HIV testing (4). This suggests a contradiction between motivations to value and protect the relationship (by not disclosing potentially risky breaks in the agreement) and motivations to keep oneself and one's partner HIV-negative (by frequently testing for HIV).

The experience of IPV showed an association with perceptions of HIV risk and vulnerability. These results reflect those seen in some recent studies with MSM (28-33) that show the experience of IPV is a significant risk factor for HIV transmission, working directly through the experience of physical trauma, lowered efficacy to negotiate condom use, and lowered access to health care services, including HIV testing and counseling. The results also provide further evidence of how power dynamics within male dyads may shape

HIV testing behaviors; it is possible that, for those in a relationship characterized by IPV or the threat of IPV, discussions around sero-status, sexual agreements or HIV are seen as potential triggers for further violence.

Conclusion

The results presented here point to the need for dyadic HIV prevention efforts for male couples. One such intervention that has gained significant attention recently is CHTC – couples HIV testing and counseling – a dyadic intervention in which both members of the couple receive HIV pre-counseling, testing and post-counseling prevention messaging together at the same time (34-38). Prevention messages are tailored to the couple's joint sero-status (concordant positive, concordant negative, or sero-discordant) and the context of the relationship (e.g. the presence or type of sexual agreement). In a CHTC session, a male couple has the opportunity to talk about their sexual agreement, to reflect upon the HIV risks associated with their agreement and to readdress their agreement in light of their HIV test results. Most importantly, a CHTC session allows a couple to practice the communication skills necessary to discuss breaks or deviations from sexual agreements, and it sets guidelines for how such discussions are to be raised and handled in the relationship. CHTC thus has the potential to address many of the barriers that are creating lower levels of testing among partnered MSM. In a non-judgmental, facilitated environment, MSM couples can talk through the realities of their sexual agreements, agree upon prevention plans and learn communication skills to facilitate future discussions around sexual behavior and HIV testing. This form of dyadic intervention may also allow a counselor to identify signs of IPV within relationships and make appropriate referrals for intervention services. CHTC has recently been adapted for MSM from the model used for heterosexuals in sub-Saharan Africa, is available in over 20 U.S cities, and was recently endorsed by the CDC as a Public Health Strategy for MSM. The scale-up and provision of CHTC is one intervention option to increase testing and lower HIV transmission among partnered MSM, a group that for too long has been overlooked by prevention efforts.

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Table 1
Characteristics of a sample of MSM of unknown or negative HIV sero-status (N=906)

	Overall % (n/N)	Relationship status		
		No main partner % (n/N)	Main Partner % (n/N)	Chi-square, df, <i>p</i> -value
Demographic characteristics				
Age				18.0, 3, <0.001**
18-24	41.6 (377/906)	48.8 (198/406)	35.8 (179/500)	
25-34	28.1 (255/906)	26.1 (106/406)	29.8 (149/500)	
35-44	13.0 (118/906)	9.6 (39/406)	15.8 (79/500)	
45 and above	17.2 (156/906)	15.5 (63/406)	18.6 (93/500)	
Race				6.0, 2, 0.049**
Non-Hispanic White	77.7 (704/906)	74.1 (301/406)	80.6 (403/500)	
Non-Hispanic Other	9.7 (88/906)	10.6 (43/406)	9.0 (45/500)	
Hispanic	12.6 (114/906)	15.3 (62/406)	10.4 (52/500)	
Sexual orientation ^a				2.2, 2, 0.337
Gay	97.4 (881/905)	96.5 (391/405)	98.0 (490/500)	
Bisexual	1.8 (16/905)	2.5 (10/405)	1.2 (6/500)	
Other	0.9 (8/905)	1.0 (4/405)	0.8 (4/500)	
Education				0.3, 2, 0.864
High school or less	20.0 (181/906)	20.0 (81/406)	20.0 (100/500)	
Some college or 2-year degree	39.7 (360/906)	40.6 (165/406)	39.0 (195/500)	
College or higher	40.3 (365/906)	39.4 (160/406)	41.0 (205/500)	
Employment				6.8, 2, 0.033**
Part-time	23.2 (210/906)	25.1 (102/406)	21.6 (108/500)	
Full-time	53.5 (485/906)	48.8 (198/406)	57.4 (287/500)	
Unemployed	23.3 (211/906)	26.1 (106/406)	21.0 (105/500)	
HIV perceived risk and testing behaviors				
Zero perceived risk of HIV	37.0 (335/906)	23.6 (96/406)	47.8 (239/500)	56.1, 1, <0.001**
High confidence in staying HIV-negative	52.9 (479/906)	46.3 (188/406)	58.2 (291/500)	12.7, 1, <0.001**
Tested in the past 6 months	34.2 (310/906)	37.4 (152/406)	31.6 (158/500)	3.4, 1, 0.065*
Testing pattern ^b				
Routinely (at least once/year)	50.9 (364/715)	53.4 (166/311)	49.0 (198/404)	1.3, 1, 0.247
After UAI with a partner of unknown/pos. sero-status	16.9 (121/715)	20.3 (63/311)	14.4 (58/404)	4.4, 1, 0.037**
Before/when starting to have sex with a new partner	25.2 (180/715)	24.4 (76/311)	25.7 (104/404)	0.2, 1, 0.690
Upon noticing or feeling symptoms of an STI	10.2 (73/715)	11.3 (35/311)	9.4 (38/404)	0.7, 1, 0.418
Upon being notified that a sex partner has an STI	11.2 (80/715)	11.6 (36/311)	10.9 (44/404)	0.1, 1, 0.773
Whenever the opportunity arises	19.9 (142/715)	22.8 (71/311)	17.6 (71/404)	3.0, 1, 0.081*

* $p < 0.10$,
 ** $p < 0.01$

**
 $p < 0.05$,

^a One participant did not report sexual orientation. 'Other' includes responses of heterosexual, questioning/unsure, and other. This variable was not included in multivariable analyses due to low variation across response options.

^b Among those who have ever tested (22 respondents reported having tested but did not provide a reason for testing). Participants could select more than one response option.

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Table 2
Adjusted odds ratios (and 95% confidence intervals) for having tested in the past 6 months, perceiving zero risk of HIV infection, and reporting high confidence in staying HIV-negative, among MSM of unknown or negative HIV sero-status (N=906)

Independent variables	Tested in the past 6 months OR (95%CI)	Zero perceived risk of HIV infection OR (95%CI)	High confidence in staying HIV- negative OR (95%CI)
Age			
18-24	1.00 (reference)	1.00 (reference)	1.00 (reference)
25-34	0.78 (0.54, 1.14)	0.87 (0.59, 1.27)	0.61 (0.43, 0.88)**
35-44	0.89 (0.56, 1.41)	0.84 (0.52, 1.35)	0.54 (0.34, 0.84)**
45 and above	0.80 (0.52, 1.22)	0.96 (0.63, 1.46)	0.55 (0.37, 0.83)**
Race			
Non-Hispanic White	1.00 (reference)	1.00 (reference)	1.00 (reference)
Non-Hispanic Other	1.09 (0.68, 1.74)	1.10 (0.68, 1.77)	1.38 (0.87, 2.19)
Hispanic	1.13 (0.74, 1.71)	1.01 (0.65, 1.56)	0.64 (0.43, 0.97)**
Education			
High school or less	1.00 (reference)	1.00 (reference)	1.00 (reference)
Some college or 2-year degree	1.22 (0.83, 1.82)	0.90 (0.62, 1.32)	1.07 (0.74, 1.54)
College or higher	1.62 (1.08, 2.45)*	0.67 (0.44, 1.00)*	1.04 (0.70, 1.53)
Employment			
Part-time	1.00 (reference)	1.00 (reference)	1.00 (reference)
Full-time	1.34 (0.91, 1.95)	0.87 (0.60, 1.27)	1.23 (0.86, 1.76)
Unemployed	1.37 (0.90, 2.09)	1.23 (0.81, 1.88)	1.02 (0.68, 1.52)
Relationship status			
No main partner	1.00 (reference)	1.00 (reference)	1.00 (reference)
Main partner	0.78 (0.59, 1.04)*	3.16 (2.35, 4.26)**	1.70 (1.30, 2.24)**

* $p < 0.10$,

* $p < 0.05$

Table 3
Characteristics of main partnerships among MSM of unknown or negative HIV sero-
status who self-report a main partnership of at least 12 months (N=314)

	% (n/N)
Relationship duration	
1 year to <2 years	22.6 (71/314)
2 years to <7 years	47.5 (149/314)
7 or more years	29.9 (94/314)
Agreement type	
Monogamy	62.4 (196/314)
Open	31.5 (99/314)
None	6.1 (19/314)
IPV (any male partner, past 12 months)	
Physical IPV	15.1 (47/312 ^a)
Sexual IPV	5.4 (17/314)
Psychological IPV	27.8 (87/313 ^a)
Any IPV	33.1 (104/314)

^aTwo participants did not respond to questions about physical IPV, one did not respond to questions about psychological IPV.

Table 4
Adjusted odds ratios (and 95% confidence intervals) for having tested in the past 6 months, perceiving zero risk of HIV infection, and reporting high confidence in staying HIV-negative, among MSM of unknown or negative HIV sero-status who self-report a main partnership of at least 12 months (N=314)

Independent variables	Tested in the past 6 months OR (95%CI)	Zero perceived risk of HIV infection OR (95%CI)	High confidence in staying HIV- negative OR (95%CI)
Age			
18-24	1.00 (reference)	1.00 (reference)	1.00 (reference)
25-34	0.44 (0.20, 0.94)	1.12 (0.56, 2.26)	0.74 (0.36, 1.50)
35-44	0.52 (0.21, 1.32)	0.86 (0.36, 2.11)	0.33 (0.14, 0.79)*
45 and above	0.65 (0.25, 1.68)	0.85 (0.34, 2.13)	0.38 (0.15, 0.93)*
Race			
Non-Hispanic White	1.00 (reference)	1.00 (reference)	1.00 (reference)
Non-Hispanic Other	2.00 (0.84, 4.76)	1.46 (0.60, 3.54)	2.66 (1.05, 6.74)**
Hispanic	0.74 (0.29, 1.89)	1.14 (0.48, 2.71)	0.35 (0.15, 0.79)**
Education			
High school or less	1.00 (reference)	1.00 (reference)	1.00 (reference)
Some college or 2-year degree	1.54 (0.63, 3.77)	0.68 (0.32, 1.47)	0.87 (0.43, 1.78)
College or higher	3.78 (1.55, 9.20)**	0.35 (0.16, 0.75)**	0.87 (0.43, 1.79)
Employment			
Part-time	1.00 (reference)	1.00 (reference)	1.00 (reference)
Full-time	1.25 (0.55, 2.81)	0.84 (0.41, 1.73)	1.34 (0.66, 2.72)
Unemployed	2.11 (0.82, 5.45)	1.45 (0.59, 3.57)	1.19 (0.51, 2.78)
Relationship duration			
1 year to <2 years	1.00 (reference)	1.00 (reference)	1.00 (reference)
2 years to <7 years	1.01 (0.47, 2.14)	1.23 (0.64, 2.35)	2.33 (1.21, 4.50)**
7 or more years	1.23 (0.46, 3.25)	1.69 (0.68, 4.19)	2.39 (1.01, 5.65)**
Agreement type			
Monogamy	1.00 (reference)	1.00 (reference)	1.00 (reference)
Open	2.93 (1.55, 5.55)**	0.08 (0.04, 0.17)**	0.35 (0.20, 0.62)**
None	1.42 (0.45, 4.49)	0.78 (0.28, 2.17)	0.38 (0.13, 1.08)*
Intimate partner violence			
No	1.00 (reference)	1.00 (reference)	1.00 (reference)
Yes	0.72 (0.38, 1.34)	0.47 (0.26, 0.83)**	0.60 (0.35, 1.03)*

* $p < 0.10$,

** $p < 0.05$