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Sexual Risk Behaviors Among Black Men Who Have Sex with Men Who Also Report Having Sex with Transgender Partners: Analysis of HIV Prevention Trials Network (HPTN) 061 Study

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Abstract

HIV Prevention Trials Network (HPTN 061) study data of Black MSM were analyzed to determine characteristics associated with having transgender sexual partners (TGP) and the association of having TGP with sexual risk. Of 1,449 cisgender MSM, 343(24%) reported also having TGP. MSM with TGP were more likely to be older, have a sexual orientation other than homosexual, have a history of incarceration, or have insufficient funds for necessities, but less likely to be HIV positive or report sex with men to health care providers. MSM with TGP were 3.67 times more likely to recently have 5+ new partners and 2.02 times more likely to report 6+ condomless sexual acts. Since MSM with TGP reported not disclosing sex with men to health care providers, these men may need tailored HIV prevention and care. Future studies should examine differing sexual risks MSM take with sexual partners with different gender identities.

Keywords

HIV; MSM; sexual risk; transgender partners

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Introduction

In 2014, 83% of the new infections among men occurred in men who had sex with men (MSM) (CDC, 2016). The rate of estimated new HIV infections among black men in the US is twice that of Hispanic/Latino men and more than 6 and ½ times that of whites (CDC, 2016). These concentrated rates of new HIV infections can be attributable to the practice of condomless anal intercourse (Baggaley, White, & Boily, 2010), but there may be other factors contributing to the infection risk of these men and the risk they pose to their sexual partners (Baggaley, White, & Boily, 2010; Jefferies, Marks, & Lauby, 2013).

Researchers have reported discordance between men's sexual identity and sexual behaviors (Baunach & Burgess, 2013; Pathela, Hajat, Schillinger, et al. 2006). In HIV literature, very few studies examine cisgender men (those assigned as males at birth and who continue to identify as males) who have sex with men (MSM) and possible associations of other sexual partner choices (such as having transgender sexual partners) and sexual risk-taking. Such an examination can reveal critical information needed to improve and tailor HIV prevention and intervention efforts for discreet MSM populations who should be studied separate from larger MSM cohorts, because their characteristics may differ. Missed screening opportunities continue to be common since some US healthcare providers are unaware of their patients' sexually risky activities, nor do they conduct adequate sexual histories to determine risk-taking behaviors men may be taking with both male and other sexual partners (Stupiansky, Liu, Rosenberger, et al. 2017). Complications can first arise when trying to understand gender identities and sexual orientation of the targeted population. For example, a San Francisco study of 489 partners of transgender persons revealed that these partners had various gender identities including males, females, and transgender identities (Wilson, Chen, & Raad et al. 2014). Another study showed that male-identified partners of transgender women could have various sexual orientations including homosexual, bisexual, and heterosexual (Operario, Burton, Underhill, & Sevelius, 2008). When it comes to risk behaviors, partners of transgender persons engaged in more condomless sex as compared to their counterparts who did not have transgender sexual partners (TGP) as well as primary partners of transgender women in another San Francisco study (Wilson, Chen, & Raad et al. 2014; Brockting, Miner, & Rosser, 2007; Operario, Nemoto, Iwanamoto, and Moore, 2011). Two studies reported substance use including poppers and methamphetamines was higher among those with TGP as compared to those without TGP (Reisner, Mimiaga, & Bland et al., 2012; Brockting, Miner, & Rosser, 2007). In addition to complications of identity, orientation, and risk behaviors, - Reisner and colleagues found that black men who reported TGP were not only more likely to have a history of substance abuse compared to those without TGP, but also more likely to have social structural factors like incarceration, PTSD, lack of social support, and they were not exposed to HIV prevention services in the past year (Reisner, Mimiaga, & Bland et al., 2012). Given the scientific research thus far, there is a need for further investigation within the context of specific gender identity and sexual orientation to determine if there are different characteristics of MSM who have TGP, and if having TGP is associated with elevated HIV risk taking behaviors among such men.

The HIV Prevention Trials Network (HPTN) 061 study was established to determine the feasibility and acceptability of a multi-component intervention, including peer health

navigation (PHN), among black MSM to reduce HIV incidence in six US cities. In the seminal manuscripts, researchers found the intense HIV epidemic was influenced by multiple behavioral and social characteristics hampering access to care and prevention (Koblin, Mayer, & Elshlman, et al. 2013; Mayer, Wang, & Koblin, et al. 2014). Moreover, Harawa and colleagues reported within the HPTN 061 distinct characteristics and patterns of subgroups like MSM who not only had both primary and non-primary female partners, but of whom 40% also had transgender partners, with 80% of them having two or more transgender partners (Harawa, Wilton, & Wang, et al. 2014). As HIV is sexually transmitted from person to person, it is imperative to understand the characteristics distinguishing partners of at risk populations such as MSM and TGP from other partners at elevated risk for HIV. Such findings can point to areas within HIV prevention efforts that can be tailored/improved to reach subset cohorts of populations like MSM.

Using HPTN 061 data from the baseline visit, the aims of this analysis were to 1) determine if black MSM who also reported having TGP were different from black MSM who reported not having TGP with regards to sociodemographics, substance use, healthcare utilization, and the use of the project's PHNs; and 2) determine if having TGP was significantly associated with two sexual risk behaviors.

Methods

Participants

A total of 1,553 self-identified African American, Caribbean, or multiethnic Black (henceforth referred to as Black) men or those who were classified as males at birth were enrolled in HPTN 061 between July 2009 and October 2010 in Atlanta, Boston, Los Angeles, New York City, San Francisco, and Washington, DC (Koblin et al., 2013; Mayer et al., 2014). Details of the study design have been published previously (Koblin, Mayer, & Elshlman, et al. 2013; Mayer, Wang, & Koblin, et al. 2014). Participants were eligible if they reported being at least 18 years old and had condomless anal intercourse with a man in the past six months. The following institutional review boards approved the study: Emory University IRB #2, Biomedical IRB (Committee A), Fenway Community Health IRB, #1, University of California, Los Angeles, South General Campus IRB, Columbia University Medical Center IRB, New York Blood Center IRB, San Francisco General Hospital Committee IRB #2, and George Washington University Medical Center IRB.

Eligibility was confirmed and written consent was obtained at participants' enrollment visit. Participants were asked to provide personal contact information and to complete a baseline behavioral assessment survey using audio computer-assisted self-interview technology (ACASI). All participants received testing for sexually transmitted infections: HIV, gonorrhea, chlamydia, and syphilis. Reactive rapid HIV tests using blood samples were confirmed by Western blot. In addition, quality assurance testing was performed retrospectively at the HPTN Laboratory Center to confirm HIV status of all participants. Participants who tested positive for infections were referred for appropriate treatment, medical care, and social services. For participants who had low or undetectable HIV RNA who did not report prior HIV diagnosis, enrollment samples were tested for the presence of antiretroviral drugs. For this analysis, participants were either classified as HIV negative (if

they had no reactive HIV test and if they tested as not having the presence of any antiretroviral drug) or as HIV positive.

Measures

For the purposes of this analysis, we considered demographic, social, healthcare, and sexual and drug- using risk characteristics.

Demographic characteristics: Demographics were collected by interviewers included age, gender identity, education, housing, employment, and income. Given that in the US blacks are overrepresented in prison populations and as many as 1 in 5 persons incarcerated are jailed for non-violent drug offenses, lifetime history of incarceration was also analyzed (Wagner & Rabuy, 2017). For income, respondents were asked how often they experienced insufficient funds to meet essential life needs in the prior six months.

Although there were 12 sexual orientations available, participants were classified into mutually exclusive categories: gay/homosexual, bisexual, heterosexual/straight, or another sexual orientation. In the ACASI, respondents were asked about their sexual partners including information regarding their partners' gender identity in the six months prior to the baseline visit. When asked about transgender partners, respondents were asked if they had partners who were transgender, and if the respondents considered those transgender partners to be male, female, or gender non-conforming person(s). Respondents were permitted to choose multiple categories regarding their transgender partners. They were not given definitions about the use of transgender terms.

Social characteristics: The adoption of safer sexual practices have been associated in research literature with normative support for risk reduction activities among black gay men (Peterson, Rothenberg, Kraft, et al. 2009). Social support was measured with six items ($\alpha = 0.94$) such as: "*How often is there someone available to whom you can count on to listen to you when you need to talk?*" and "*How often is there someone available to you to give you good advice about a problem?*" (Berkman & Syme, 1979). Responses were based on a five-point scale from none of the time (=0) to all of the time (=5). Participants' social support was categorized as low if their combined score was ≤ 13 , medium if the score was between 14 and 21, and high if the score was ≥ 22 .

Healthcare characteristics: The use of peer health navigators (PHNs) was an integral part of the HPTN 061 multi-component intervention (Koblin, Mayer, & Elshlman, et al. 2013; Mayer, Wang, & Koblin, et al. 2014). PHNs conducted assessments of participants' healthcare history and unmet service needs, and then met with participants over time to implement action plans. For this analysis two questions were about the study were examined: "*whether or not a participant accepted PHN at baseline*" and "*how many PHN sessions the participant attended over the course of their participation in the project*". In addition, another three healthcare utilization measures were analyzed: having "*a particular place*" to get healthcare, admitting being "*sexually attracted to or having sex with other men*" to a healthcare provider, and reasons for choosing to "*get your (their) last HIV test*".

Sexual and drug using risk behaviors: In 2012 Centers for Disease Control and Prevention (CDC) researchers developed a seven-item index screener for predicting HIV infection risk (HIRI-MSM) (Smith, Pales, & Herbst, et al. 2012). Since some of the HPTN 061 categorical responses were close to the HIRI-MSM measures, we decided to analyze the associations of having a TGP with two specific sexual risk behaviors: 1) having had 5 or more new partners during the six months prior to data collection; and 2) six or more condomless sexual acts in the six-month period prior to baseline data collection. Additional reported evidence indicated that new partners, whether concurrent with existing partners or in quick succession (short-term relationships), can increase HIV risk for MSM, and partnership concurrency has been reported to be more prevalent among MSM compared to heterosexual men (Glick, Morris, Foxman, et al. 2012). Based on existing research findings linking drug use with HIV risk among MSM, we choose to examine stimulant substance use in the six-month period prior to baseline data collection (Boone, Cook, Wilson, 2013; Smith, Pales, Herbst, et al. 2012; McKirnan, Vanable, & Ostrow, 2001).

Exchange of sex was also measured using a composite variable of receiving and purchasing sex for money, drugs, food, or a place to stay in the six months prior to baseline.

Statistical Analysis

Logistic regressions models were fitted to assess associations between demographic and participant characteristics and the outcome of reporting having TGP, generating unadjusted odds ratios. Bivariate modeling was performed first, and all characteristics were then included in a multivariate model. Multivariate models were also adjusted for participants' city of residence, generating adjusted odds ratios. Logistic regression modeling was performed to assess associations between participant characteristics and the outcomes of having five or more new partners or having six or more condomless sex acts in the past six months. Chi-square tests were performed to test for associations between reported healthcare characteristics and having TGP. Reported healthcare behavioral characteristics included healthcare location, disclosure of MSM status to healthcare providers, rationale for HIV testing, PHN acceptance, and number of PHN visits. Analyses were conducted using SAS® version 9.2 (SAS Institute Inc., Cary, NC) and Stata Corp. 2013. *Stata Statistical Software: Release 13*. College Station, TX: Stata Corp LP.

Results

Of 1553 participants in the HPTN 061 study, six participants with no data on having transgender sexual partners (TGP) were excluded. An additional 98 participants who did not identify as male were also excluded, leaving 1449 black cisgender MSM (men) for this analysis. Among the 1449 men, 33.7% were 30 years old, 52.0% identified as gay or homosexual, 40.6% were ever incarcerated, 22.6% had insufficient funds for necessities at least fairly often, and 22.3% were HIV-infected. Of 1449 men, 343 (24%) also reported having a TGP. Of these men 199 (58%) reported having both transgender male and transgender female partners and only 51 (14.8%) indicated they exclusively had transgender female partners. Since we were unable to disentangle the large group and because small

sample size of the group with only transgender female sexual partners was too small to analyze, we decided to compare all of the men with TGP to those who did not have TGP.

In bivariate analysis, men who were 46 years old, reported being heterosexual, bisexual, or another sexual orientation, were ever incarcerated, reported they had insufficient funds for necessities once in a while or more often in the six months prior to baseline, reported recent stimulant use, and/or who had low or medium social support were more likely to report having TGP (Table 1). Men who were 30 years old and men who were HIV-positive were less likely to report TGP. In multivariate analysis, the following characteristics were associated with greater odds of having a transgender partner: being 46 years old [Adjusted Odds Ratio (AOR) = 1.69; (95% Confidence Interval (CI): 1.22, 2.35]; reporting an identity not gay/homosexual including bisexual (AOR = 3.53; 95% CI: 2.53, 4.93), heterosexual (AOR = 2.60; 95% CI: 1.17, 5.76), or another sexual identity (AOR = 2.37; 95% CI: 1.51, 3.74); reporting having insufficient funds fairly or very often (AOR = 1.89; 95% CI: 1.31, 2.73); ever being incarcerated (AOR = 1.86; 95% CI: 1.34, 2.60). Men who were 30 years old (AOR = 0.61; 95% CI: 0.41, 0.91) and men who were HIV-positive were less likely to report TGP (AOR = 0.54; 95% CI: 0.36, 0.80). In the multivariate analysis, stimulant use was not significantly associated with reporting TGP.

Men with TGP were more likely to obtain healthcare through public health or research programs, and were more likely to get their last HIV test because they considered themselves at risk for HIV compared to men without TGP (Table 2). Men with TGP were less likely to admit their sexual attraction to or having sex with other men to healthcare providers as compared to men with no TGP.

Data were available on number of new partners for 1428 (98.6%) of the 1449 men; 431 (30.2%) reported having five or more new partners in the six-month period prior to baseline data collection (Table 3). In bivariate analysis, men who reported also having transgender partner(s), being heterosexual or bisexual, having insufficient funds for necessities fairly or very often, having low social support, and exchanging sex for money, drugs, food, or a place to stay were more likely to report having five or more new partners in the six months prior to baseline data collection. HIV positive men were less likely to report five or more new partners. In multivariate analysis, having TGP remained significantly associated with having five or more new partners (AOR = 3.67; 95% CI: 2.67, 5.05) as did exchanging sex for money, drugs, food, or a place to stay (AOR = 2.29; 95% CI: 1.67, 3.12).

Data were available on the number of condomless sex acts for 1404 (96.9%) of 1449 men; 475 (33.8%) reported having six or more condomless sexual encounters in the six months prior to baseline. In bivariate analyses, men who also reported having a transgender partner, being heterosexual, bisexual or another sexual orientation, ever being incarcerated, having insufficient funds once in a while or more often, recent stimulant use, low social support, and exchanging sex for money, drugs, food, or a place to stay were more likely to report having six or more condomless sex acts in the six months prior to baseline (Table 4). Men 30 years old were less likely to report having six or more condomless sexual encounters in the prior six months. In the multivariate analysis, having a transgender partner (AOR = 2.02; 95% CI: 1.48, 2.77) remained significantly associated with reporting six or more

condomless sexual acts in the six months prior to baseline, as was being heterosexual (AOR = 2.58; 95% CI: 1.09, 6.14), bisexual (AOR = 2.51; 95% CI: 1.86, 3.38) or another sexual orientation (AOR = 1.58; 95% CI: 1.04, 2.41), and/or exchanging sex for money, drugs, food, or a place to stay (AOR = 2.11; 95% CI: 1.57, 2.85). Men who were 30 years old remained less likely to report having six or more condomless sexual encounters in the adjusted model (AOR = 0.65; 95% CI: 0.46, 0.91).

Discussion

This study is a unique analysis of a large multi-city specific gender-identified sample of black cisgender MSM who also reported having transgender sexual partners (TGP) (N=343). Our findings expand that of previous studies, which either had small samples of black men reporting TGP and/or were conducted in a single location (Wilson, Chen, Raad, et al. 2014; Reisner, Mimiaga, Bland, et al. 2012; Operario, Nemoto, Iwamoto & Moore, 2011). While our sample of men admitted for the purposes of the study to having sex with other men, 90% those with TGP did not identify as being homosexual. Additionally, our sample was older, had recent economic hardship, and had a history of incarceration corroborating other previous study findings (Operario, Burton, Underhill, & Sevelius, 2008; Reisner, Mimiaga, Bland, et al. 2012). Stimulant usage, in the bivariate models was significantly associated with having TGP and in reporting six or more condomless sex acts but was not significantly associated with the reporting 5 or more new partners. It is possible because the cohort was of black MSM at risk for HIV, the stimulant usage was overall common to the whole group. Our sample of MSM who had TGP was less likely to be HIV positive or have a high social support composite score than MSM without TGP. Although our subsample of MSM with TGP like other HPTN 061 participants did not fully utilize the intervention's peer health navigators (PHN), this coupled with their low composite score of social support may be an indication of fear of stigmatization and/or being ashamed of sexual partnering.

When examining the association of having a TGP with the analyzed risky sexual behaviors (of having 5 or more new partners or having 6 or more condomless sexual encounters in the most recent six months), having a TGP remained significantly associated with reporting five or more new partners or six or more condomless sexual acts in the prior six months, even when controlling for other characteristics and behaviors. These findings suggest that cisgender MSM who reported having TGP are engaging in risky sexual behaviors more than other MSM who do not have TGP. Our findings along with those of the smaller San Francisco cohort of male sexual partners of transgender women (Operario, Nemoto, Iwamoto & Moore, 2011), suggest these men who have had recent sex with other men and TGP may be a critical transmission link between two vulnerable populations. Thus, tailored HIV prevention efforts geared toward the subset of MSM who have TGP could be paramount in curbing the epidemic.

A critical setback to our findings is that, 75.4% of our study sample, like in other studies (Wilson, Chen, Raad, et al. 2014), did not disclose their sexual attraction or activities with men to health care providers. This could be explained by the expectations some patient have that health care providers will initiate discussion about sensitive topics such as sexual behaviors but there may be other factors (Bernstein, Liu, Begier et al. 2008; Epstein, Morse,

Frankel, et al. 1998). However, it could be explained by stigma or the fear of stigma. Today, identifying as being homosexual is commonly accepted. Being bisexual however, can elicits negative attitudes and sometimes stigma. Past literature has suggested that MSM who are bisexually identified are stigmatized not just by the heterosexual population, but also by gay and lesbian individuals which may make the bisexual men more reluctant to fully disclose the gender identities of all their concurrent sexual partners (Friedman, Dodge, & Schick, et al. 2014). Future research is needed to understand why some men are reluctant to disclose to sexual behaviors with their healthcare providers, and if men like those in our study are also reluctant to disclose their sexual relationship with TGP to other people - such as concurrent male partners. It will be critical to study trends in terminology, relationship dynamics, and nuances within subpopulations of larger cohorts; but it is paramount that evidence from such studies improve sexual health messaging to reach all people not as targeted groups but as people who engage in risky activities no matter their gender identity and sexual orientation or those of their partners.

Despite the lower percentage of participants with TGP who tested HIV positive, as in Wilson et al. (Wilson, Chen, Raad, et al. 2014), this study is only an introductory exploration into the potential risky sexual behaviors of MSM who transgender sexual partners. We recommend future in-depth research that focuses specifically on cisgender men who have sex with a variety of gendered persons (including: transgender women, transgender men, or transgender gender non-conforming) and other concurrent partnerships (such as those with cisgender men and/or cisgender women) to understand their current and potential behaviors, which can put all at risk for HIV acquisition. It would be important to understand multiple aspects of these relationships, including well-stated definitions cisgender men and their transgender sexual partners have of the relationships (primary vs. casual) and acceptable terminology for transgender partners' gender identity and sexual orientation, if there are different patterns of sexual risk behavior among those men with their different types of partners, the role of sexual positioning, and/or the use of illicit substances when having sex. Current HIV risk literature on transgender women, for example, states that their risks often occur in the context of their primary relationships but it is not clear if the male partners also considered these as primary relationships or if risk between male partners of transgender men and transgender non-conforming persons is as risky (Operario, Nemoto, & Iwamoto, 2011; Poteat, Wirtz, Radix, et al. 2015). In addition, more needs to be understood about the power dynamics of such coupling, because previous literature has stated that transgender persons who engage in survival sex are at increased risk for HIV (Poteat, Wirtz, Radix, et al. 2015; Nemoto, Operario, Keatley, et al. 2004).

With treatment options as well as pre-exposure prophylaxis (PrEP) available, it is imperative that we study dyads of men with their TGP and the presence and potential of HIV risk. In a 2014 article on gender minority stressors and substance use among transgender women and their non-transgender partners, the authors suggested that future research should carefully examine the influence of partners' health habits and whether or not gender minority stress is experienced at the dyad levels (Reisner, Gamarel, Nemoto, & Operario, 2014). Including coupled men with their transgender sexual partners in the same study may provide more detailed information and increase knowledge about how relationships affect risk and protection.

Limitations

The data used were self-reported although they were collected through ACASI which should reduce reluctance to report certain behaviors. Given that respondents could choose multiple transgender partner classifications (i.e. transgender male, transgender female, transgender gender non-conforming) and the definitions of our transgender terminology was not clearly stated, we were unable to study differences between men who had transgender female partners vs. those who had transgender male partners vs. those who had transgender gender non-conforming partners. We were also unable to study differences between those who may have identified transgender partners as primary versus casual partners. Future comparison would provide greater insight into partnerships and possibly ways in which to help mitigate HIV infection for this unique population within the larger population of MSM.

Conclusions

Black cisgender MSM who also have sex with TGP engaged in risky sexual behaviors placing themselves and partners at increased risk for HIV acquisition. Furthermore, these MSM were unlikely to disclose their sex with other men to their healthcare providers, thereby potentially hampering tailored prevention discussions and care. More research is needed to understand how these men define and conceptualize their sexual relationships with transgender sexual partners, if the gender identity of those partners' further impacts sexual risk choices and behaviors, and if improved, honest communications regarding sexual relations to healthcare providers can improve the provision of HIV prevention, care, and treatment.

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Table 1:

Bivariate and multivariate associations with having transgender partners (N=1449)

Characteristic	Total	Reported <i>not</i> having transgender sexual partners n=1106 (76%)	Reported having transgender sexual partners n=343 (24%)	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio [#] (95% CI)
<i>Demographic characteristics</i>					
Age					
<= 30	488	429 (87.9%)	59 (12.1%)	0.42 (0.30, 0.59)	0.61 (0.41, 0.91)
31–45	523	395 (75.5%)	128 (24.5%)	Ref	
>=46	438	282 (64.4%)	156 (35.6%)	1.71 (1.29, 2.26)	1.69 (1.22, 2.35)
Sexual Orientation					
Gay/Homosexual	753	672 (89.2%)	81 (10.8%)	Ref	
Bisexual	487	295 (60.6%)	192 (39.4%)	5.40 (4.03, 7.24)	3.53 (2.53, 4.93)
Heterosexual	35	21 (60.0%)	14 (40.0%)	5.53 (2.71, 11.3)	2.60 (1.17, 5.76)
Other	174	118 (67.8%)	56 (32.2%)	3.94 (2.66, 5.83)	2.37 (1.51, 3.74)
Incarceration (lifetime)					
No	588	505 (85.9%)	83 (14.1%)	Ref	
Yes	836	581(69.5%)	255 (30.5%)	2.67 (2.03, 3.52)	1.86 (1.34, 2.60)
Insufficient funds to meet life needs					
Never	650	542 (83.4%)	108 (16.6%)	Ref	
Once in a while	470	352 (74.9%)	118 (25.1%)	1.68 (1.25, 2.26)	1.16 (0.82, 1.65)
Fairly often/very often	328	212 (64.6%)	116 (35.4%)	2.75 (2.02, 3.73)	1.89 (1.31, 2.73)
<i>Social characteristics</i>					
Social support					
Low social support	305	214 (70.2%)	91 (29.8%)	1.99 (1.45, 2.75)	1.39 (0.95, 2.02)
Medium social support	460	340 (73.9%)	120 (26.1%)	1.65 (1.23, 2.22)	1.29 (0.92, 1.81)
High social support	620	511 (82.4%)	109 (17.6%)	Ref	
<i>Drug-using behavior and HIV status</i>					
Stimulant drug use					
No	869	700 (80.6%)	169 (19.4%)	Ref	
Yes	527	371 (70.4%)	156 (29.6)	1.74 (1.35,2.24)	0.88 (0.65, 1.21)
HIV status					
Negative	1090	793 (72.8%)	297 (27.2%)	Ref	
Positive	322	280 (87.8%)	42 (13.0%)	0.40 (0.28, 0.57)	0.54 (0.36, 0.80)

[#]Odds ratios were adjusted for respondents' place of residence

Table 2:

Associations of healthcare behavior with having transgender partners

	Reported <i>not</i> having transgender sexual partners n=1106 (76%)	Reported having transgender sexual partners n=343 (24%)	Test Statistic (χ^2)	p-value
<i>Healthcare behavior</i>				
Has a particular place to get healthcare			25.830	<0.001
HIV/AIDS testing facilities and programs	34 (4.0%)	3 (1.1%)		
Jail or prison	8 (0.9%)	4 (1.4%)		
Other	55 (6.4%)	18 (6.5%)		
Private	152 (17.8%)	20 (7.2%)		
Public health or research programs	607 (70.9%)	232 (83.8%)		
Told healthcare provider attracted to or have sex with other men	604 (55.3%)	83(24.6%)	97.806	<0.001
Why did you choose to get your last HIV test?			18.719	<0.001
Other reasons	368 (39.3%)	72 (25.3%)		
Potential risk reasons	568 (60.7%)	213 (74.7%)		
Accepted Peer Health Navigation	547 (52.7%)	192 (57.5%)	2.381	0.123
Number of visits with the Peer Health Navigators			2.807	0.246
0	292 (53.6%)	115 (59.9%)		
1	71 (13.0%)	25 (13.0%)		
2+	182 (33.4%)	52 (27.1%)		

Table 3:

Bivariate and multivariate logistic regression with having 5 or more “new” partners in the prior 6 months as the outcome (N=1428)

Characteristic	Total	# with 5 or more new partners in last 6 months N=431	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio [‡] (95% CI)
Transgender partners				
No	1087	249 (22.9%)	Ref	
Yes	341	182 (53.4%)	3.85 (2.98, 4.97)	3.67 (2.67, 5.05)
<i>Demographic characteristics</i>				
<i>Age</i>				
<= 30	485	148 (30.5%)	0.94 (0.72, 1.23)	1.28 (0.92, 1.78)
31–45	515	164 (31.8%)	Ref	
>=46	428	119 (27.8%)	0.82 (0.62, 1.09)	0.57 (0.41, 0.80)
<i>Sexual Orientation</i>				
Gay/Homosexual	739	189 (25.6%)	Ref	
Bisexual	483	178 (36.9%)	1.70 (1.33, 2.18)	1.10 (0.81, 1.49)
Heterosexual	34	14 (41.2%)	2.04 (1.01, 4.11)	1.47 (0.61, 3.57)
Other	172	50 (29.1%)	1.19 (0.83, 1.72)	0.94 (0.60, 1.45)
<i>Incarceration</i>				
No	582	167 (28.7%)	Ref	
Yes	823	260 (31.6%)	1.15 (0.91, 1.45)	0.84 (0.63, 1.13)
<i>Insufficient funds</i>				
Never	638	176 (27.6%)	Ref	
Once in a while	463	135 (29.2%)	1.08 (0.83, 1.41)	0.92 (0.68, 1.26)
Fairly often/very often	326	120 (26.8%)	1.53 (1.15, 2.03)	1.06 (0.75, 1.49)
<i>Social characteristic</i>				
<i>Social support</i>				
Low social support	300	106 (35.3%)	1.44 (1.07, 1.94)	1.05 (0.74, 1.48)
Medium social support	454	139 (30.6%)	1.17 (0.89, 1.52)	0.96 (0.71, 1.30)
High social support	612	168 (27.5%)	Ref	
<i>Sexual and drug-using risk behaviors and HIV status</i>				
<i>Stimulant drug use</i>				
No	859	252 (29.3%)	Ref	
Yes	519	165 (31.8%)	1.12 (0.89, 1.42)	0.84 (0.62, 1.14)
<i>Exchanged sex for money, drugs, food, a place to stay</i>				
No	1042	270 (25.9%)	Ref	
Yes	359	159 (44.3%)	2.27 (1.77, 2.92)	2.29 (1.67, 3.12)
<i>HIV status</i>				
Negative	1080	348 (32.2%)	Ref	
Positive	311	76 (24.4%)	0.68 (0.51, 0.91)	0.96 (0.68, 1.33)

[‡]Odds ratios were adjusted for respondents' place of residence

Table 4:

Bivariate and multivariate logistic regression with having 6 or more unprotected sex acts in the prior 6 months as the outcome (N = 1404)

Characteristic	Total	# Having 6 or more condomless sex acts in last 6 months N=475 (%)	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio [‡] (95% CI)
Transgender partners				
No	1073	290 (27.0%)	Ref	
Yes	331	185 (55.9%)	3.42 (2.65, 4.42)	2.02 (1.48, 2.77)
<i>Demographic characteristics</i>				
Age				
<= 30	481	108 (22.5%)	0.44 (0.33, 0.58)	0.65 (0.46, 0.91)
31–45	511	204 (39.9%)	Ref	
>=46	412	163 (39.6%)	0.99 (0.76, 1.28)	0.75 (0.55, 1.03)
Sexual Orientation				
Gay/Homosexual	726	152 (20.9%)	Ref	
Bisexual	477	239 (50.1%)	3.79 (2.94, 4.89)	2.51 (1.86, 3.38)
Heterosexual	32	17 (53.1%)	4.28 (2.09, 8.77)	2.58 (1.09, 6.14)
Other	169	67 (39.6%)	2.48 (1.74, 3.54)	1.58 (1.04, 2.41)
Incarceration				
No	574	145 (25.3%)	Ref	
Yes	810	323 (39.9%)	1.96 (1.55, 2.48)	1.11 (0.83, 1.49)
Insufficient funds				
Never	625	171 (27.4%)	Ref	
Once in a while	459	170 (37.0%)	1.56 (1.21, 2.02)	1.23 (0.91, 1.68)
Fairly often/very often	319	134(42.0%)	1.92 (1.45, 2.55)	1.22 (0.86, 1.72)
<i>Social characteristic</i>				
Social support				
Low social support	293	121 (41.3%)	1.65 (1.23, 2.20)	0.97 (0.69, 1.37)
Medium social support	450	152 (33.8%)	1.19 (0.92, 1.55)	0.88 (0.65, 1.20)
High social support	605	181 (29.9%)	Ref	
<i>Sexual and drug-using risk behaviors and HIV status</i>				
Stimulant drug use				
No	849	238 (28.0%)	Ref	
Yes	506	219 (43.3%)	1.96 (1.55, 2.47)	1.15 (0.86, 1.54)
Exchanged sex for money, drugs, food, a place to stay				
No	1026	281 (27.4%)	Ref	
Yes	354	185 (52.3%)	2.90 (2.26, 3.73)	2.11 (1.57, 2.85)
HIV status				
Negative	1062	371 (34.9%)	Ref	

Characteristic	Total	# Having 6 or more condomless sex acts in last 6 months N=475 (%)	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio [‡] (95% CI)
Positive	305	94 (30.8%)	0.83 (0.63, 1.09)	1.04 (0.74, 1.44)

[‡]Odds ratios were adjusted for respondents' place of residence

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