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Sexual stigma patterns among Nigerian men who have sex with men and their link to HIV and sexually transmitted infection prevalence

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Abstract

Sexual stigma facilitates the spread of HIV and sexually transmitted infections (STIs) but little is known about stigma affecting Nigerian men who have sex with men (MSM). We assessed patterns of sexual stigma across Nigerian MSM and their relationship to HIV and STIs. Data were collected from the TRUST/RV368 Study, a prospective cohort of 1,480 Nigerian MSM enrolled from March 2013 to February 2016 using respondent driven sampling. Structural equation modeling was utilized to assess the association between stigma classes and HIV and STI prevalence, adjusting for participants' characteristics. A dose-response association was found between stigma class and HIV prevalence (27%, 40%, 55%, overall χ^2 $p < .001$) and STI prevalence (15%, 21%, 24%, overall χ^2 $p = .011$). These data suggest that stigma mitigation strategies, combined with increased engagement of MSM and retention in the HIV care

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Compliance with Ethical Standards

Conflicts of Interest

The authors declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Approval for the study was obtained by the Federal Capital Territory Health Research Ethics Committee, the University of Maryland Baltimore Institutional Review Board (IRB), and the Walter Reed Army Institute of Research IRB.

Disclaimer

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continuum, need to be a component of interventions focused on reducing HIV transmission risks among MSM in Nigeria.

Keywords

Men who have sex with men; stigma; latent class analysis; HIV infections; sexually transmitted infections

INTRODUCTION

Men who have sex with men (MSM) are disproportionately affected by HIV as compared to other reproductive aged men in every region of the world.[1] Individual-level behaviors including condomless sex have been insufficient in explaining the rising HIV epidemic among MSM,[2] in large part due to the high transmissibility of anal sex, leading to a greater focus on structural factors such as sexual stigma.[3] Sexual stigma, which is commonly defined as the co-occurrence of labeling, stereotyping, separation, status loss, and discrimination within a power imbalance[4] specifically affecting gay men and other MSM related to same-sex practices,[5] is pervasive in much of the world including sub-Saharan Africa (SSA). The most commonly reported manifestations or mechanisms of sexual stigma in SSA are enacted stigma, which refers to behavioral expressions of stigma such as physical violence, rape, and blackmail, and felt stigma, which refers to fear that enacted stigma may occur such as fear of seeking health care.[6–13] These forms of sexual stigma are interlinked and are important to assess because they often affect behavior and health outcomes.

Most studies have assessed sexual stigma using variable-centered approaches, utilizing individual indicators or summary score measures. For example, homophobic abuse, as a single indicator of sexual stigma, was positively associated with HIV infection among Ugandan MSM.[14] However, homophobic abuse combined such varied experiences as verbal, moral, physical or sexual abuse, and assumed that they could be treated as interchangeable. Another approach has been to aggregate multiple mechanisms of sexual stigma into a summary score with a cut point. A study assessing sexual stigma-related violence towards Tanzanian MSM summed together any experiences of physical, verbal, moral or sexual abuse, which was then dichotomized at the median into low violence vs. high violence.[15] A potential limitation of this approach is that there are often no clear guidelines regarding where to place cut-offs which may result in classification errors of sexual stigma subgroups.[16] Another variable-centered approach is to use factor analysis to develop sexual stigma factors,[17] but in factor analysis the emphasis is on identifying relations between variables, assuming that these relations apply across all individuals.[18]

Because sexual stigma is a social process and may manifest itself through a variety of mutually reinforcing mechanisms, adopting a person-centered latent modeling approach such as latent class analysis (LCA) will better account for various negative experiences related to same-sex practices that individually differ between MSM.[4,19] The advantage of LCA is that it identifies patterns of responses across individuals in order to find meaningful homogeneous groups that would be difficult to discern by assessing indicators separately. [18] Such an approach is better able to model stigma as a fundamental cause of health[20]

and identify sub groups of MSM for whom health interventions can be designed and targeted. Additionally, latent classes can then be utilized within structural equation models to assess the association between latent variables and observed variables, such as behavioral or biological outcomes of sexual stigma. Few studies have used person-centered latent modeling approaches to assess sexual stigma among MSM. Studies of sexual minorities in Chicago, IL, that have used person-centered latent modeling approaches, found that classes consisting of participants experiencing higher internalized stigma were associated with higher levels of victimization, depression and posttraumatic stress disorder.[21,22]

Although sexual stigma has only recently begun to be described in Nigeria,[12,23–25] expanding criminalization of same-sex practices in Nigeria has been associated with increased fear and avoidance of healthcare[24] and internalized homophobia has been associated with HIV prevalence among MSM.[23] Given that the HIV epidemic is still spreading regardless of the implementation of the treatment as prevention (TasP) and pre-exposure prophylaxis (PrEP) intervention strategies, there is a great need to use an innovative approach to further assess sexual stigma and its potential psycho-social consequences and impact on intervention strategies among MSM in Nigeria. In this study, we applied the LCA approach to identify patterns of sexual stigma affecting Nigerian MSM, assessed which participants' characteristics were associated with stigma patterns, and evaluated whether stigma patterns were associated with HIV and sexually transmitted infection (STI) prevalence.

METHODS

Study Design and Data Collection Procedures

The TRUST/RV368 study is a prospective multi-site cohort that utilizes respondent-driven sampling (RDS) to recruit MSM into a comprehensive model of HIV prevention, treatment, and care services in Abuja and Lagos, Nigeria, as previously described.[26,27] Eligibility criteria included individuals who: 1) were assigned the male sex at birth; 2) were at least 16 years old; 3) had a history of insertive or receptive anal sex within the last year; 4) agreed to participate in the study for 18 months; 5) agreed to STI testing including for HIV; 6) were able to provide informed consent either in English or Hausa, and; 7) presented a valid RDS recruitment coupon. All participants provided written informed consent.

All eligible participants completed the full baseline behavioral questionnaire and were provided with HIV testing and counselling upon enrollment using a parallel algorithm of Determine® (Alere, Waltham, MA, USA) and Uni-gold® (Trinity Biotech, Co-Wicklow, Ireland) and STAT-PAK (Chembio, NY, USA) as the tie-breaker. Urine and rectal swab specimens were collected at enrollment and tested for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoea* (GC) using the Aptima Combo 2® assay (Hologic, Bedford, MA, USA). Prevalent STI infection was defined as a positive CT and/or GC infection at baseline. All variables in these cross-sectional analyses were from participants' baseline data collection. Analysis was conducted using MPlus Version 7.4.[28]

Measures

A review of the literature revealed nine stigma indicators, seven enacted stigma and two perceived stigma, that reflected types of sexual stigma experiences found to be prevalent in the US, Western Africa, and Southern Africa.[29] The nine indicators asked about lifetime experience of the following stigma that they believe occurred as a result of having sex with men: family made discriminatory remarks, rejection from friends, refusal from police to protect, verbal harassment, blackmail, physical violence, rape, fear of seeking health care and fear of walking in public. Participants' characteristics that have been found to be associated with sexual stigma and with HIV infection among sexual minorities were included as covariates, including age, gender (male, female, both/versatile), disclosure, and having had a female sex partner in the last 12 months.[12,19,23] Disclosure was assessed with two questions: "Have you told any member of your family that you have sex with other men or that you are attracted to other men?" and "Have you told any health care worker that you have sex with other men or that you are attracted to other men?" RDS recruitment wave was included to account for changing participant characteristics as sampling progresses to harder-to-reach subpopulations in the later waves of recruitment[27] and was dichotomized based on enrollment during the first or second half of sampling waves.

Analyses

Latent class analysis—Latent class analysis (LCA) was conducted on nine stigma indicators and models with two to six classes were examined for fit. The final number of classes was decided by comparing fit statistics, including the Bayesian information criterion (BIC), the Lo-Mendell-Rubin (LMR) likelihood ratio test and the bootstrapped likelihood ratio test (BLRT); all three tests have been found to be good indicators for class enumeration.[30] The model with the lowest BIC value and the last model for which the LMR and BLRT p-value is at or below .05 has the best goodness of fit. The BIC and LMR favored the three-class model and the BLRT favored a four-class model. After a review of the conditional item probabilities, which suggested a meaningful grouping of classes with an adequate number of participants per class, a more parsimonious three-class model was selected to fit the data best (Table 1). Classification accuracy was moderate, with an entropy value of .67.

Structural equation modeling—Figure 1 shows the analytical model exploring the association between stigma and distal outcomes (HIV and STI prevalence). Structural equation modeling that accounts for possible measurement error in latent classes is preferable to approaches that do not account for measurement error (e.g. traditional regression), because true class membership is unknown.[31] We utilized the manual 3-step BCH method, a modification of a method originally developed by Bolck, Croon, and Hagenaars,[32,33] which has been demonstrated to outperform other three-step approaches for assessing the association between latent classes and distal outcomes.[34] First, an LCA is run without covariates and distal outcomes. Second, BCH weights are saved, which reflect the measurement error of the latent class variable and lead to a significant reduction in bias as compared to hard classification approaches. Third, the association between the distal outcome and the latent class variable is estimated while adjusting for covariates of the latent class-distal outcome association and using the BCH weights. In this way, the model controls

for the influence of covariates on both the latent class variable and also the distal outcomes that could cause confounding. We tested for overall differences in the prevalence of distal outcomes across the stigma classes using a Wald Test and based pairwise comparisons on z-tests.

RESULTS

Sample characteristics

From March 2013 to February 2016, a total of 1,480 participants (n=961 from Abuja and n=519 from Lagos) who completed the baseline questionnaire were included. The sample predominately consisted of MSM who were younger (<25 years old, 59.9%), and male-identified (82.1%) (Table 1). The majority had not disclosed their same-sex practices to a family member or a health worker. The prevalence of different types of sexual stigma varied from 16.0% having ever felt that the police refused to protect them to 32.2% having ever experienced verbal harassment because they have sex with men (Figure 2).

Overall, 548 (37.0%, CI 34.6%-39.5%) tested positive for HIV and 276 (18.6%, CI 16.7%–20.7%) tested positive for STIs.(Table 2).

Latent stigma classes

The three stigma classes that emerged from the LCA represented low (n=605, 41%), medium (n=680, 46%), and high stigma subgroups (n=195, 13%) (Figure 2). Although the results of the LCA suggested that stigma followed a spectrum of severity, there were several qualitative differences between the latent classes. The only indicator that was relatively high across all stigma classes was fear of seeking health care (14% in low, 37% in medium, and 63% in high stigma classes). The most common indicator in the medium and high stigma classes was verbal harassment, with nearly universal reporting of verbal harassment in the high stigma class. Prevalence of stigma indicators were similar for the medium and high classes, except that more aggressive or overt types of stigma, such as physical violence and blackmail, were more pronounced in the high stigma class.

Covariates of class membership

Table 1 presents the prevalence of each covariate among the entire sample and adjusted associations between covariates and class membership. Compared to individuals in the low stigma class, individuals in the high stigma class were more likely to have identified their gender as female (adjusted odds ratio (aOR)=2.65, 95%CI=1.64–4.30, p-value=.001) and both/versatile genders (aOR=4.00, 95%CI=1.87–8.53, p-value=.003), and to have disclosed their same-sex practices to a family member (aOR=14.13, 95%CI=6.94–28.78, p-value<.001), to a health worker (aOR=2.95, 95%CI=1.85–4.72, p-value<.001), and to both a family member and health worker (aOR=31.86, 95%CI=12.78–79.43, p-value<.001). They were less likely to report having a female sex partner in the last 12 months (aOR=0.38, 95%CI=.26–.56, p-value<.001) and to be recruited later into the study (aOR=0.61, 95%CI=.42-.90, p-value=.038). Similar to those in the high stigma class, participants in the medium stigma class were less likely to have had a female sex partner (aOR=0.62, 95%CI=.47-.81, p-value=.004) and more likely to have disclosed their same-sex practices to a family member

(aOR=4.66, 95%CI=2.28–9.55, p-value<.001), to a health worker (aOR=2.13, 95%CI=1.53–2.96, p-value<.001), and to both family and a health worker (aOR=8.25, 95%CI=3.11–21.88, p-value<.001), as compared to the low stigma class.

As sexual stigma class increased in severity, there was a significant gradient increase in HIV prevalence (27%, 40%, 55%, overall χ^2 p<.001) and STI prevalence (15%, 21%, 24%, overall χ^2 p=.011), adjusting for age, gender, having had a female sex partner in the last 12 months, disclosure of same-sex practices, and recruitment wave (Table 3).

DISCUSSION

Through the use of a latent class analysis approach, we found that sexual stigma was pervasive and differentially distributed across stigma classes among MSM in Nigeria. More importantly, there was a distinct dose-response relationship between stigma classes and HIV and STI outcomes, especially for that of HIV prevalence, underscoring a potentially causal role that stigma may play in the acquisition of HIV and STIs. This finding supports the assertion that sexual stigma is an important fundamental determinant of health as it affects a range of outcomes through a series of mutually reinforcing stigma mechanisms.[4,20] Our approach both reinforces existing studies on sexual stigma's association with HIV/STI prevalence[14,15,35] while also improving on these studies by eliciting cohesive subgroups of MSM whose distribution of stigma experiences differed in meaningful ways and possessed a number of distinguishing socio-demographic characteristics. The distinct participant characteristics of each stigma subgroup provide an opportunity to develop and test the effectiveness of stigma mitigation interventions that are tailored to MSM subgroups at higher risk of experiencing sexual stigma.

We found that sexual stigma was a multifaceted construct. Experiences occurred across a variety of contexts and were perpetrated by different types of people, including family, friends, and the police, suggesting the need for multilevel approaches. This finding reinforces the work of Hatzenbuehler and others who state that stigma remains a persistent problem in societies partly because a flexible set of stigma mechanisms are available to achieve harmful ends.[4,20] As has been found to be effective for addressing HIV-related stigma, multilevel approaches addressing multiple stigma mechanisms are needed to address sexual stigma.[36] Interventions combining HIV programming with peer education and sensitization training for health providers have been found to be effective in reducing sexual stigma among MSM in several contexts.[37,38] Fear of seeking healthcare was the one stigma indicator that was prevalent across all three stigma classes in this study. Therefore, sensitization training for health providers may have the potential to reach the broadest range of MSM in Nigeria and can have a profound impact in engaging MSM into HIV and STI prevention and care.[39]

In addition to developing comprehensive, multilevel interventions, interventions tailored to subgroups more severely impacted by sexual stigma should be explored, especially for individuals who disclose their same-sex practices or who do not identify their gender as male. Disclosure of same-sex practices to family and/or to a health care worker was the single most important covariate of elevated sexual stigma. Interventions to facilitate

disclosure safely to family and health workers may be important to the well-being of sexual minorities and improve their access to appropriate health services. Research in multiple countries has suggested that family treatment of sexual minorities is an especially important factor for their health and some organizations are beginning to address this by facilitating consultations between sexual minorities and their families.[19,40–42] Research has also found that concealment of same-sex practices inhibits access to HIV prevention and care services[43–45] and that knowledge of the high transmissibility of HIV for anal sex in SSA is low as a result of lack of discussion around HIV prevention within the context of same-sex practices.[46] Facilitating disclosure has the added benefit of giving sexual minorities greater visibility and increasing personal contact between sexual minorities and heterosexual individuals, a factor which has made societies in higher-income countries more accepting of sexual minorities within a relatively short span of time.[47] But, given the aggressive forms of sexual stigma experienced by participants in the high and medium stigma classes, having legal and mental health services already in place may be necessary following an incident of sexual stigma in response to disclosure by an individual.

Stigma mitigation interventions may need to prioritize the intersection of violence, gender, and HIV that is shaping the context for why individuals in the high-stigma class are experiencing such elevated levels of sexual stigma. The finding that high sexual stigma was associated with identifying as female and with both genders is consistent with previous studies and it supports the assertion that sexual stigma is often a form of gender-based violence.[19,48–50] Few studies have assessed the health of individuals that do not identify as male in SSA, but given that a gender that is not exclusively male is associated with very high levels of HIV[51] and with sexual stigma globally, strategies addressing varying gender identities should be coupled with stigma mitigation interventions. For example, a study in Mexico and Thailand not only implemented a violence screening tool but also provided sensitization training to providers on gender, integrated questions on sex and gender into existing clinical forms, and worked with women's shelters to admit MSM and transgender violence victims.[48]

A potentially more holistic way to address high levels of sexual stigma would be to integrate a trauma-informed care approach within one-stop shop venues serving MSM. Research on trauma has revealed that people living with HIV/AIDS (PLWH) have often experienced multiple and intersecting forms of trauma in their life, including trauma as a result of sexual stigma, and there are calls to integrate such an approach as a standard of care for PLWH worldwide.[52] Integrating a trauma-informed approach within MSM-friendly venues has the potential to reduce retraumatization and to serve as an entry point to a comprehensive set of health-related services. The addition of screening tools and psychosocial support and fostering naturally-occurring resiliencies and enabling new ones to address trauma may reduce fear of seeking health care as a result of sexual stigma and improve access to HIV prevention and care services.[26,53–55]

There are a number of limitations in this study. Although the sample size was large, it may be that had there been more participants and more stigma indicators included, the LCA would have identified more classes with greater nuance. Even though we selected nine stigma indicators shown to be highly prevalent among MSM from different countries, it is

also possible that important stigma indicators may have been omitted. The RDS sampling method was based on initial participants drawn from a well-networked community-based organization. This may have biased the sample in favor of having more HIV positive participants. We attempted to account for the characteristics of earlier participants in the study by adjusting for recruitment wave, but did not adjust for the sampling method directly using RDS estimators. The temporal ordering of variables in this cross-sectional dataset is unclear, therefore it is difficult to assess causality and it is possible that covariates or sexual stigma followed HIV and STI infection rather than preceded it.

This study strengthens the existing body of evidence on the importance of sexual stigma by developing a more nuanced measure of sexual stigma that is linked to both HIV and STIs while adjusting for participant characteristics. In settings of high levels of sexual stigma more progress is needed to fast track the provision of “one-stop shop” clinics with culturally competent services. For example, the site for this study is a collaboration between a community based organization (CBO) that provides peer education to sexual minorities and a clinical study that provides HIV testing, counseling, and treatment via providers that have received sensitization training. This collaboration, along with other “one-stop shop” models, have been successful at improving HIV testing and engagement with care among MSM. [26,37,56] This model could be improved by expanding to explicitly include services that address sexual stigma and other types of trauma experienced by clients. Approaches that are trauma-informed may be a promising method to mitigate sexual stigma and could address the intersectional nature of the issues of violence, gender, and HIV. Additionally, sexual stigma should be explicitly addressed in national HIV planning efforts in Nigeria along with efforts to reduce HIV-related stigma in order to achieve “zero discrimination.”[57] Achieving the UNAIDS goal to end the HIV/AIDS epidemic by 2030 may not be possible if sexual stigma mitigation approaches are not integrated into combination HIV programs for Nigerian MSM.

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Methods Steps

- 1 A latent stigma variable is created using latent class analysis (LCA) and weights are also created which reflect the measurement error of stigma classes (A)
- 2 Using structural equation modeling, stigma is regressed on participant characteristics and the distal outcome is regressed on stigma as well as participant characteristics. The weights in step 1 are applied in order to account for potential measurement error in the LCA (B-D)

Legend

- A Latent stigma classes (results in Figure 2)
- B Regression of stigma classes on participant characteristics (results in Table 3)
- C Regression of distal outcome on stigma classes (results in Table 4)
- D Regression of distal outcome on participant characteristics (results in Table 4)

Figure 1.

Structural equation model for the assessment of the association between distal outcomes and stigma classes, adjusting for participant characteristics

Stigma Indicator ^a	Full Sample (n=1480)		Three-Class Stigma Model		
			Low	Medium	High
			(40.9%, 605)	(45.9%, 680)	(13.2%, 195)
	N	%	Conditional item probabilities:		
Family Made Discriminatory Remarks	298	20.1	0.01	0.26	0.58
Friend Rejection	288	19.5	0.03	0.22	0.62
Fear of Seeking Health Care	454	30.7	0.14	0.37	0.63
Police Refused to Protect Them	236	16.0	0.05	0.16	0.49
Scared to Walk in Public	278	18.8	0.05	0.20	0.60
Verbally Harassed	476	32.2	0.00	0.42	0.96
Blackmailed	349	23.6	0.01	0.31	0.78
Physical Violence	298	20.3	0.02	0.21	0.77
Rape	250	17.0	0.08	0.21	0.32

^aAll questions are asked of participants as have they ever experienced each indicator and was it because they have sex with men. Family made discriminatory remarks is missing 1, police refused to protect them is missing 3, physical violence is missing 9, and rape is missing 8 responses.

Figure 2.
Individual stigma indicators and results of the latent class analysis for the three-class model in a sample of Nigerian men who have sex with men.

Table 1

Goodness of fit statistics for stigma models with two to six classes in a sample of Nigerian men who have sex with men.

Classes	Parameters	Log Likelihood	BIC ^a	LMR ^b (p-value)	BLRT ^c (p-value)	Smallest Class ^d	Entropy
2	19	-6276.583	12691.862	1227.35 (.000)	1244.16 (.000)	496 (33%)	0.74
3	29	-6210.336	12632.367	130.70 (.000)	132.49 (.000)	195 (13%)	0.67
4	39	-6187.941	12660.573	44.18 (.110)	44.79 (.000)	133 (9%)	0.69
5	49	-6172.18	12702.05	31.13 (.164)	31.52 (.013)	42 (3%)	0.71
6	59	-6160.524	12751.737	22.99 (.383)	23.31 (.333)	61 (4%)	0.68

Bolded font indicates which number of classes the statistic indicated had the best fit.

^aBIC= Bayesian Information Criterion

^bLMR= Lo-Mendell-Rubin likelihood ratio test

^cBLRT= Bootstrap likelihood ratio test

^dThis is the size and proportion of participants placed in the smallest class of this model

Table 2

Adjusted odds ratios comparing different stigma classes by participant characteristics in a sample of Nigerian men who have sex with men.

Covariates of Stigma Class	Full Sample (n=1480)		High Stigma vs Low Stigma			Medium Stigma vs Low Stigma		
	N	%	AOR ^a	95% CI ^b	p-value	AOR ^a	95% CI ^b	p-value
Age								
<25	887	59.9	ref.			ref.		
25	593	40.1	1.32	0.90 1.92	0.230	1.26	0.96 1.66	0.169
Gender Identity								
Male	1,212	82.1	ref.			ref.		
Female	180	12.2	2.65	1.64 4.30	0.001	1.14	0.73 1.78	0.632
Both/Versatile	84	5.7	4.00	1.87 8.53	0.003	2.16	1.04 4.49	0.085
Had Female Sex Partner(s) in Last 12 Months								
No	718	48.5	ref.			ref.		
Yes	762	51.5	0.38	0.26 0.56	0.000	0.62	0.47 0.81	0.004
Ever Disclosed Homosexuality								
Neither	902	61.0	ref.			ref.		
To Family Member	114	7.7	14.13	6.94 28.78	0.000	4.66	2.28 9.55	0.000
To Health Worker	328	22.2	2.95	1.85 4.72	0.000	2.13	1.53 2.96	0.000
To Both	130	8.8	31.86	12.78 79.43	0.000	8.25	3.11 21.88	0.000
Sample Recruitment Wave								
First Half (0–11)	830	56.1	ref.			ref.		
Second Half (12–27)	646	43.7	0.61	0.42 0.90	0.038	0.98	0.75 1.28	0.908

Bolded font indicates the p-value was significant at p<.05

^a AOR= Adjusted odds ratio^b CI= Confidence Interval

Table 3

The association of stigma with HIV and sexually transmitted infection (STI) prevalence, adjusting for participant characteristics: overall test of significance, pairwise comparisons, and associations between distal outcomes and participant characteristics in a sample of Nigerian men who have sex with men.

Stigma Classes	HIV Prevalence				STI Prevalence					
	Overall Wald test p-value<.001				Overall Wald test p-value=.011					
	%	SE ^a	Pairwise comparisons	p-value	%	SE ^a	Pairwise comparisons	p-value		
High Stigma	0.55	0.04	High vs. Low	0.001	0.24	0.03	High vs. Low	0.089		
Medium Stigma	0.40	0.02	Medium vs. Low	0.000	0.21	0.02	Medium vs. Low	0.005		
Low Stigma	0.27	0.02	High vs. Medium	0.432	0.15	0.02	High vs. Medium	0.857		
Association of Covariates to Distal Outcomes										
Age										
<25			ref.				ref.			
25			1.13	1.08	1.18	0.000	0.95	0.92	0.022	
Gender Identity										
Male			ref.				ref.			
Female			1.12	1.05	1.19	0.005	1.02	0.96	1.07	0.656
Both/Versatile			1.15	1.05	1.26	0.009	1.03	0.95	1.11	0.586
Had Female Sex Partner(s) in Last 12 Months										
No			ref.				ref.			
Yes			0.95	0.91	0.99	0.025	0.98	0.94	1.01	0.249
Ever Disclosed Homosexuality										
Neither			ref.				ref.			
To a Family										
Member			1.08	1.00	1.17	0.121	1.09	1.01	1.18	0.073
To a Health										
Worker			1.17	1.11	1.23	0.000	1.03	0.99	0.93	0.191
To Both			1.20	1.11	1.31	0.000	0.99	0.92	1.06	0.758
Sample Recruitment Wave										
First Half (0–11)			ref.				ref.			

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Association of Covariates to Distal Outcomes	AOR	95% CI ^b	p-value	AOR	95% CI ^b	p-value
Second Half (12–27)	0.93	0.89	0.97	0.94	0.91	0.97

Bolded font indicates the p-value was significant at p<.05

^a SE= standard error

^b AOR= Adjusted odds ratio