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Stigma and healthcare access among men who have sex with men and transgender women who have sex with men in Senegal

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Abstract

Objectives: Cisgender gay, bisexual, and other men who have sex with men and transgender women experience HIV incidence disparities in Senegal. These analyses determined how depression and different stigma mechanisms related to sexual behavior are associated with healthcare access, sexually transmitted infection testing, and HIV testing among cisgender gay, bisexual, and other men who have sex with men and transgender women across three cities in western Senegal.

Methods: Logistic regression assessed the relationship of three stigma scales (stigma from family and friends, anticipated healthcare stigma, and general social stigma) and depression with these outcomes.

Results: Depression and stigma were not associated with healthcare access, sexually transmitted infection testing, or HIV testing. However, individuals who had disclosed their sexual identity to a medical provider were more likely to test for HIV.

Conclusions: Sexual behavior stigma experienced by cisgender gay, bisexual, and other men who have sex with men and trans women in Senegal may not limit access to routine healthcare, but may limit disclosure of sexual orientation and practices, limiting access to appropriate HIV prevention services.

Keywords

Stigma, men who have sex with men, transgender women, HIV, Senegal, depression

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Introduction

The World Health Organization (WHO) estimates that 38 million people are living with HIV globally, 67% of whom live within sub-Saharan Africa (SSA),[1] yet in 2021, there remains limited attention on the needs of specific and key populations, including transgender women, gay men, and other men who have sex with men (MSM) living in SSA. Studies from SSA have consistently demonstrated higher burdens of HIV among cisgender MSM (cis-MSM) as compared to other similarly aged men in SSA.[2] One recent study has shown that by providing antiretroviral treatments (ARTs) to 74% of MSM, HIV incidence could be reduced by as much as 68%.[3] In addition, a recent study demonstrated consistently higher burdens of HIV among transgender women compared to cisgender women in sub-Saharan African countries for which there are data available.[4] In Senegal specifically, studies have estimated that MSM have an HIV

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prevalence between 22% and 28%, while the prevalence among transgender women is estimated to be 39%.[5] The recognition of the unmet needs among cis-MSM and transgender women has been limited by significant social stigma and even criminalization of same-sex practices in Senegal.[6–8]

Given disparities in HIV infection and prevalence experienced by these populations, it is vitally important to understand the drivers of incident HIV infection among cis-MSM and transgender women across SSA.[2,9] Among social and environmental factors, stigma has been shown to influence deleterious health conditions. Stigma has been linked with numerous adverse health outcomes among cis-MSM in SSA, including testing positive for HIV,[10] suicidal ideation,[8] depression, alcohol use, sexual behaviors, such as condomless anal sex,[11] and lower testing frequency for HIV.[12,13] Among transgender women, sexual behavior stigma has been associated with greater engagement in condomless anal sex and sex work.[14] In one study, 36% of transgender women living in Senegal reported experiencing stigmatizing remarks from family members, while 41% of sex workers living with HIV reported forced sex.[15] Stigma occurs when a given characteristic is identified, labeled, and linked to negative attributions, often resulting in a loss of social status or acts of discrimination.[15] Stigma is a complex social phenomenon that can manifest through perception (e.g. feeling devalued by others), anticipation (e.g. fearing mistreatment by healthcare providers), experience (e.g. through acts of discrimination or denial of services), and/or internalization (e.g. developing a sense of shame about one's sexual orientation or gender identity). In Senegal, depression symptomology and stigmatizing experiences remain a pivotal indicator of healthcare access among cis-MSM and transgender women.[10,11] In addition, the prevalence of HIV testing in Senegal remains far behind the intended 95-95-95 goals for HIV epidemic control. Specifically, a recent study of Senegal-based MSM receiving HIV self-testing kits highlighted that as many as 46.9% were first-time testers and only 26.2% had tested within the last year.[16] Depressive disorders have an estimated prevalence of 3.9% among all adults, with this estimate ranging by area and sexual minority population, with a notable increase among MSM living with HIV.[17] MSM living in Senegal have also been shown to be more likely to report at least one form of HIV-related stigma (33%) compared to other cisgender men living with HIV (18%), with verbal harassment the most common stigmatizing experience reported (44%).[15]

Given that experiences of stigma are commonly reported by MSM in Senegal, including an intense fear for one's safety and wellbeing, studying health outcomes of stigma is critically important.[5,13,18] Specifically, generating a more nuanced understanding of the various dimensions of stigma and its association with depression and healthcare access is warranted given the disparate prevalence of HIV, limited uptake of services, and high levels of stigma affecting these communities. In response, the objective of this study was to analyze the impact of stigma on healthcare access, specifically use of health clinics and HIV or other sexually transmitted infection (STI) testing services by cis-MSM and trans women in Senegal.

Methods

Design and setting

We conducted secondary analysis of data collected during the baseline survey of a longitudinal cohort study in three urban sites in western Senegal (Dakar, Mbour, and Thiès). The Johns Hopkins Bloomberg School of Public Health (JHSPH) Institutional Review Board (IRB# 00005832) and the National Research Ethics Committee in Senegal reviewed the study protocol and provided ethical approval for this study.

Sampling and recruitment

Prospective participants were recruited into the study via respondent-driven sampling (RDS) from February to November 2015. To be eligible for inclusion in the study, prospective participants must have been (1) 18 years of age or older, (2) reported being assigned the male sex at birth, and (3) reported having had sex with one or more men in the past year. Gender was assessed using a two-step gender assessment asking (1) sex at birth and (2) what gender you consider yourself to be.[19] Exclusion criteria included being younger than 18 years, reported being assigned the female sex at birth, reported not having had sex with at least one man in the past year, and not residing in Senegal. Transgender women (trans women) in the study were individuals who reported male sex at birth and female gender identity. Working closely with multiple community groups in Senegal, these concepts were independently translated into Wolof and then back into English for comparison to ensure non-stigmatizing, appropriate, and accurate translations of terms and concepts related to gender. In the case that any differences in translation arose, such differences were brought back to community partners for further discussion and final decisions.[19]

Individuals meeting these criteria were then asked to provide written informed consent in French or Wolof to be enrolled in the study. All participants who consented and enrolled completed the baseline study questionnaire. Participants who completed the baseline assessment were provided up to three coupons to recruit other participants through RDS, a method which has been well-described elsewhere.[20] Participants received transport reimbursement for the baseline visit (about 4 US dollars (US$) in Mbour and Thiès and 6 US$ in Dakar). Participants who referred others to the study received additional transport reimbursement (about 2 US$) for each participant referred.

Measures

The baseline assessment instrument included questions related to demographics, stigma, mental health, substance

abuse, sexual history, and HIV-risk behaviors. Assessments were completed during face-to-face interviews in either French or Wolof by a trained social worker or outreach worker having received human subjects research ethics training (e.g. Collaborative Institutional Training Initiative (CITI) training).

Healthcare access (outcome). The healthcare access items utilized in this study have been developed and previously used in both qualitative and quantitative approaches. Although the quantitative validity has not been published, these items have been used extensively in previous research.[21–24] We asked three binary questions to measure the outcome of access to general and/or sexual healthcare: (1) "Have you ever gone to a health center for your own health (public, private, or mobile clinic)?" (2) "Have you ever been tested for STIs, such as syphilis, gonorrhea, chlamydia, herpes, etc.?" and (3) "Have you ever been tested for HIV infection?"

Stigma (predictor). Thirteen sexual behavior stigma items were administered, which were chosen based on prior studies of human rights and HIV risk among MSM to represent different levels of the socioecological experience of stigma in an effort to support content validity.[5,21,23] Prior psychometric evaluation of the scale via exploratory factor analysis in multiple SSA countries (including the present sample) has found that the items measure three distinct stigma constructs (Supplement A).[7] The corresponding construct-specific subscales include a three-item measure of stigma from family and friends (Cronbach's $\alpha = 0.80$; range = 0–3); a two-item subscale of anticipated healthcare stigma ($\alpha = 0.89$; range = 0–2); and a nine-item subscale of general social stigma ($\alpha = 0.69$; range = 0–9). Items 1–11 were dichotomous (no, yes), while items 12–13 originally comprised two questions each. These items, "Has anyone ever physically hurt you (pushed, showed, slapped, hit, kicked, choked, or otherwise physically hurt you)" and "Have you ever been forced to have sex when you did not want to? (By forced, I mean physically forced, coerced to have sex, or penetrated with an object when you did not want to)," were condensed with a follow-up item asking, "Do you believe any of these experiences of violence were related to the fact that you have sex with men?" Thus, an affirmative answer indicated having experienced physical or sexual violence because of having sex with men.[7,25,26] For all items, response categories for this analysis were dichotomized into ever (1) versus never (0) experienced.

Depression (predictor). We used the Patient Health Questionnaire (PHQ)-9[27] to assess depression within this sample. This widely used scale has been previously validated with a West African population,[28] where the PHQ-9 exemplified good concurrent validity with a similar depression measure (Beck's Depression Inventory, $r = 0.67$, $p = < 0.001$) and good 1-month test–retest reliability ($r = 0.89$, $p = < 0.001$). Respondents indicated the frequency with which they had experienced nine symptoms over the past 2 weeks on a 5-point Likert-type scale ranging from (0) "not at all" to (4) "every day." The scores across the nine items were summed to create a total score that could range from 0 to 27. Cronbach's alpha for the PHQ-9 was 0.84 in our sample, indicating strong internal consistency.

Covariates. Gender, age group, education, and employment were controlled for in all analyses. Respondents reported how old they were at study baseline, from which four age categories were created (less than 20, between 20 and 24, between 25 and 29, and 30 or older). Education was gauged as last grade completed with responses collapsed into four categories (never attended school, primary school or below, some secondary school, and secondary school graduate or above). Finally, respondents indicated their primary current employment status as unemployed; self-employed (formal), for example, owns a shop, is a formal market vendor; self-employed (informal), for example, street vendors, peanut seller, fruit seller; private or public employed; student; and other.

In addition, we assessed HIV serostatus and disclosure of sexual orientation to the participant's medical provider. HIV serostatus was measured with a rapid antibody test for HIV.

Analysis

Frequency distributions were calculated for categorical covariates and means, medians, and standard deviations (SDs) were calculated and displayed for depression and each stigma subscale. Separate multiple logistic regressions were used to determine how each stigma subscale and depression, adjusting for covariates, were associated with (1) ever having been to a clinic, (2) ever having tested for an STI, and (3) ever having tested for HIV. Multicollinearity between predictors was checked using variance inflation factors. Choice of covariates included in the regression was based on prior knowledge and literature. Models were theoretically derived, and therefore neither backward elimination nor forward selection was used. Following model creation, sensitivity analyses were performed without the depression variable to determine whether results differed. To confirm statistical power, an achieved power calculation was conducted. Assuming a p value of 0.05 and our observed odds ratio of depression and stigma scores, post hoc analyses indicated having 95.6% to 99.8% power depending on exact model specifications. Data analyses for this article were generated using SAS software version 9.4[29] with permission granted for its use from the SAS Institute (Cary, NC, USA).

Results

Of the 724 enrolled participants across the three study sites, 198 (27%) were trans women and 526 (72.6%) were cisgender men. The mean age of participants was 24.3 years (range = 18–62 years; Table 1). Most participants were

employed in either a formal or informal occupation ($n=523$; 72%); of the remainder, 104 reported being unemployed (14%), 96 reported being students (13%), and one individual did not provide an occupation. Based on baseline HIV testing, 219 participants (30%) were living with HIV.

The mean PHQ-9 score was 6.45 (SD=5.2) and did not vary significantly by gender (cisgender men: M=6.48, SD=5.18; trans women: M=6.72, SD=5.74, $p=0.62$). The mean scores for each of the three sexual behavior stigma average subscale scores overall were 0.36 (SD=0.83) for stigma from family and friends; 0.33 (SD=0.70) for anticipated healthcare stigma; and 1.17 (SD=1.57) for general social stigma. Stigma from family and friends and general social stigma mean scale scores were higher for trans women (M=0.50, SD=0.97 and M=1.10, SD=1.29, respectively) as compared to cisgender men (M=0.31, SD=0.76 and M=0.81, SD=1.26, respectively). Anticipated healthcare stigma mean score (M=0.33) was equivalent for trans women and cisgender men (SD=0.71 and SD=0.70, respectively). In multivariate logistic regressions, neither depression ($p=0.94$) nor any stigma subscale (family and friends: $p=0.13$; anticipated healthcare: $p=0.37$; general social stigma: $p=0.96$) was significantly related to ever having attended a clinic while disclosing to a medical provider was ($p<0.001$; Table 2). These scales were also not significantly associated with having received an STI test (stigma from family and friends: $p=0.95$; anticipated healthcare stigma: $p=0.36$; general social stigma: $p=0.19$; and depression: $p=0.34$; Table 3). However, individuals who had never disclosed their sexual orientation to a medical provider were less likely to have ever received an HIV test ($p<0.001$; Table 4).

We also performed a sensitivity analysis to determine how the results would differ without depression in the models. The results were consistent in both the model for ever having attended a clinic and the model for ever having received an STI test. In the model for ever having received an HIV test, stigma from family and friends was significant ($p<0.05$), but neither anticipated healthcare stigma ($p=0.07$) nor general social stigma was significant ($p=0.67$; Table 5). In addition, the sensitivity analysis was consistent with the original model presented in Table 5; individuals who had never disclosed their sexual orientation to a medical provider were less likely to have ever received an HIV test ($p<0.001$).

Discussion

The objective of this study was to determine whether different stigma mechanisms and depression were associated with engagement in healthcare services among a sample of cisgender men and transgender women reporting sex with men in Senegal. In this study, neither depression nor stigma from family and friends, anticipated healthcare stigma, and general social stigma were significantly associated with having attended a clinic or having received an STI or HIV test. However, having received an HIV test was significantly

Table 1. Demographics of the sample ($n=724$).

Demographics	*n*	%
Gender		
MSM	521	72.0
Trans MTF who have sex with men	185	25.6
Other MSM	13	1.8
Missing	5	0.7
Age group		
Less than 20	150	20.7
Between 20 and 24	304	42.0
Between 25 and 29	159	22.0
30 or older	111	15.3
Education		
Never attended school	45	6.2
Primary school or below	310	42.8
Some secondary school	180	24.9
Secondary school graduate or above	189	26.1
Employment		
Unemployed	104	14.4
Self-employed (formal)	83	11.5
Self-employed (informal)	241	33.3
Private or public employed	47	6.5
Student	96	13.3
Other	152	21.0
Missing	1	0.1
Self-reported HIV serostatus		
Yes	33	4.6
No	438	60.5
Missing	253	34.9
HIV test result		
Negative	505	69.8
Positive	219	30.2
Ever disclosed sexual orientation to medical provider?		
Yes	195	26.9
No	492	68.0
Missing	37	5.1
Ever disclosed sexual orientation to family or friends?		
Yes	198	27.3
No	523	72.2
Missing	3	0.4
PHQ-9 score (range = 0–27)		
Mean	6.45	
Median	5	
SD	5.2	
Stigma from family and friends (range = 0–3)		
Mean	0.36	
Median	0	
SD	0.83	
Stigma from healthcare workers (range = 0–2)		
Mean	0.33	
Median	0	
SD	0.7	
Experienced stigma (range = 0–9)		
Mean	1.17	
Median	1	
SD	1.57	
Total	724	100.0

MTF: male-to-female; PHQ-9: Patient Health Questionnaire-9; SD: standard deviation.

Table 2. Multiple logistic regression of stigma scales on ever having been to a clinic among MSM and trans women who have sex with men in Senegal ($n = 724$).

Predictor	Estimate	Standard error	p value	OR (95% CI)
Gender (REF = trans women who have sex with men)	$p = 0.002$			
MSM	0.87	0.26	< 0.01	2.38 (1.43–3.96)
Other MSM	–0.56	0.70	0.41	0.56 (0.14–2.23)
Age group (REF = 30 or older)	$p = 0.577$			
Less than 20	–0.05	0.35	0.84	0.95 (0.47–1.89)
Between 20 and 24	0.002	0.31	0.99	1.00 (0.54–1.83)
Between 25 and 29	0.35	0.34	0.31	1.42 (0.72–2.80)
Education (REF = secondary school graduate or above)	$p = 0.081$			
Never attended school	–1.15	0.46	0.01	0.31 (0.12–0.78)
Primary school or below	–0.53	0.31	0.08	0.58 (0.32–1.06)
Some secondary school	–0.50	0.29	0.08	0.60 (0.33–1.07)
Employment (REF = self-employed (informal))	$p = 0.110$			
Other (specify)	–0.69	0.30	0.02	0.50 (0.27–0.90)
Private or public employed	–0.28	0.43	0.50	0.74 (0.32–1.74)
Self-employed (formal)	0.25	0.37	0.49	1.29 (0.62–2.68)
Student	–0.85	0.38	0.02	0.42 (0.20–0.90)
Unemployed	–0.41	0.30	0.17	0.65 (0.36–1.20)
Perceived stigma from family and friends (range = 0–3)	–0.21	0.14	0.13	0.80 (0.61–1.06)
Anticipated healthcare stigma (range = 0–2)	0.12	0.14	0.37	1.13 (0.85–1.50)
Experienced stigma (range = 0–9)	–0.003	0.07	0.96	0.99 (0.86–1.15)
PHQ-9 score	0.001	0.02	0.94	1.00 (0.96–1.04)
Ever disclosed sexual orientation to medical provider? (REF = disclosed)	–0.90	0.25	0.0005	0.40 (0.24–0.67)

OR: odds ratio; CI: confidence interval; MSM: men who have sex with men; PHQ: Patient Health Questionnaire-9.

Table 3. Multiple logistic regression of stigma scales on ever having an STIs test among MSM and trans women who have sex with men in Senegal ($n = 724$).

Predictor	Estimate	Standard error	p value	OR (95% CI)
Gender (REF = trans women who have sex with men)	$p = 0.15$			
MSM	0.26	0.30	0.39	1.29 (0.72 –2.32)
Other MSM	1.47	0.76	0.05	4.36 (0.98 –19.4)
Age group (REF = 30 or older)	$p = 0.0002$			
Less than 20	–1.39	0.50	0.006	0.25 (0.09 –0.66)
Between 20 and 24	–0.24	0.35	0.50	0.79 (0.40 –1.57)
Between 25 and 29	0.40	0.35	0.26	1.49 (0.74 –2.97)
Education (REF = secondary school graduate or above)	$p = 0.04$			
Never attended school	0.46	0.64	0.48	1.58 (0.45 –5.53)
Primary school or below	1.08	0.40	0.007	2.95 (1.35 –6.48)
Some secondary school	0.76	0.42	0.07	2.15 (0.94 –4.89)
Employment (REF = self-employed (informal))	$p = 0.03$			
Other (specify)	0.88	0.39	0.02	2.42 (1.13 –5.19)
Private or public employed	0.01	0.51	0.98	1.01 (0.37 –2.75)
Self-employed (formal)	0.94	0.37	0.01	2.56 (1.23 –5.31)
Student	1.33	0.50	0.008	3.77 (1.42 –9.99)
Unemployed	0.61	0.38	0.11	1.83 (0.88 –3.83)
Perceived stigma from family and friends (range = 0–3)	0.07	0.16	0.65	1.07 (0.79 –1.46)
Anticipated healthcare stigma (range = 0–2)	–0.31	0.19	0.11	0.74 (0.51 –1.07)
Experienced stigma (range = 0–9)	0.14	0.08	0.08	1.15 (0.98 –1.35)
PHQ-9 score	–0.02	0.02	0.53	0.98 (0.94 –1.03)
HIV test result (REF = HIV negative)	0.09	0.26	0.72	1.10 (0.66 –1.82)
Ever disclosed sexual orientation to medical provider? (REF = disclosed)	–0.51	0.26	0.05	0.60 (0.36 –1.00)

STI: sexually transmitted infections; OR: odds ratio; CI: confidence interval; MSM: men who have sex with men; PHQ-9: Patient Health Questionnaire-9.

Table 4. Multiple logistic regression of stigma scales on ever having an HIV test among MSM and trans women who have sex with men in Senegal ($n = 724$).

Predictor	Estimate	Standard error	p value	OR (95% CI)
Gender (REF = trans women who have sex with men)	$p = 0.13$			
MSM	–0.40	0.23	0.08	0.67 (0.43 –1.05)
Other MSM	0.79	1.12	0.48	2.20 (0.24 –19.80)
Age group (REF = 30 or older)	$p < 0.0001$			
Less than 20	–1.07	0.36	0.003	0.34 (0.17 –0.69)
Between 20 and 24	–0.60	0.32	0.06	0.55 (0.29 –1.03)
Between 25 and 29	0.56	0.38	0.14	1.76 (0.83 –3.73)
Education (REF = secondary school graduate or above)	$p = 0.19$			
Never attended school	0.05	0.45	0.91	1.05 (0.44 –2.53)
Primary school or below	0.44	0.29	0.14	1.55 (0.87 –2.77)
Some secondary school	0.54	0.29	0.06	1.71 (0.98 –2.99)
Employment (REF = self-employed (informal))	$p = 0.08$			
Other (specify)	0.63	0.31	0.04	1.87 (1.02 –3.43)
Private or public employed	–0.01	0.43	0.99	0.99 (0.43 –2.30)
Self-employed (formal)	–0.29	0.32	0.38	0.75 (0.40 –1.42)
Student	0.64	0.39	0.10	1.90 (0.89 –4.05)
Unemployed	–0.23	0.30	0.45	0.79 (0.44 –1.44)
Perceived stigma from family and friends (range = 0–3)	0.27	0.17	0.10	1.31 (0.95 –1.82)
Anticipated healthcare stigma (range = 0–2)	–0.25	0.13	0.05	0.78 (0.60 –1.01)
Experienced stigma (range = 0–9)	0.01	0.08	0.89	1.01 (0.87 –1.18)
PHQ-9 score	0.03	0.02	0.12	1.04 (0.99 –1.08)
Ever disclosed sexual orientation to medical provider? (REF = disclosed)	–1.26	0.27	< .0001	0.28 (0.17 –0.48)

OR: odds ratio; CI: confidence interval; MSM: men who have sex with men; PHQ-9: Patient Health Questionnaire-9.

Table 5. Sensitivity analysis of stigma scales on ever having an HIV test among MSM and trans women who have sex with men in Senegal ($n = 724$).

Predictor	Estimate	Standard error	p value	OR (95% CI)
Gender (REF = trans women who have sex with men)	$p = 0.14$			
MSM	–0.39	0.23	0.09	0.68 (0.43 –1.06)
Other MSM	0.80	1.12	0.47	2.24 (0.25 –20.1)
Age group (REF = 30 or older)	$p < 0.0001$			
Less than 20	–1.19	0.35	0.0008	0.31 (0.15 –0.61)
Between 20 and 24	–0.68	0.32	0.03	0.51 (0.27 –0.94)
Between 25 and 29	0.48	0.38	0.20	1.62 (0.77 –3.41)
Education (REF = secondary school graduate or above)	$p = 0.19$			
Never attended school	0.04	0.44	0.93	1.04 (0.44 –2.48)
Primary school or below	0.41	0.29	0.16	1.50 (0.85 –2.66)
Some secondary school	0.55	0.28	0.05	1.73 (0.99 –3.00)
Employment (REF = self-employed (informal))	$p = 0.12$			
Other (specify)	0.53	0.30	0.08	1.69 (0.94 –3.07)
Private or public employed	–0.05	0.43	0.91	0.96 (0.41 –2.21)
Self-employed (formal)	–0.29	0.32	0.36	0.75 (0.40 –1.40)
Student	0.59	0.38	0.12	1.80 (0.85 –3.82)
Unemployed	–0.25	0.30	0.40	0.78 (0.43 –1.39)
Perceived stigma from family and friends (range = 0–3)	0.33	0.16	0.04	1.39 (1.01 –1.91)
Anticipated healthcare stigma (range = 0–2)	–0.24	0.13	0.07	0.79 (0.61 –1.02)
Experienced stigma (range = 0–9)	0.03	0.08	0.67	1.03 (0.89 –1.20)
Ever disclosed sexual orientation to medical provider? (REF = disclosed)	–1.24	0.27	< 0.0001	0.29 (0.17 –0.49)

OR: odds ratio; CI: confidence interval; MSM: men who have sex with men.

associated with stigma from family and friends in the absence of depression. Furthermore, never having disclosed one's sexual orientation to a medical provider was associated with lower odds of ever having received an HIV test.

These findings have relevant implications for the identification of new HIV infections in Senegal, suggesting that stigma experienced by cis-MSM and trans women may prevent adequate access to HIV screening with depression as a potential mechanism through which stigma may act, necessitating future longitudinal exploration to formally assess mediation. A systematic review highlighted the utility of stigma mitigation interventions in improving the potential effect of HIV prevention and treatment programs reinforcing the results here that integrating stigma mitigation may support improved diagnoses among marginalized communities.[30] If and how stigma mitigation interventions can be effectively integrated or layered with depression prevention or treatment programs is an important future area for both research and programs.

In addition to how stigma may act in conjunction with depression, our findings suggest that disclosure is another relevant construct to consider in potentially understanding these pathways. A prior systematic review found that among MSM across several countries, uptake of HIV testing varied widely from 16% to 90%, as MSM living in areas where sexual behavior stigma was more common, were less likely to disclose to healthcare providers.[31] Specifically, early identification of HIV infection and initiation of ART are key to reducing the disproportionate burden of HIV and other STIs for communities affected by stigma across SSA, including MSM and transgender women.[32] However, sexual and gender minorities may not receive care that is responsive to their needs if they are not able to talk about sexual behaviors with their providers because they are afraid to disclose, acting as a further barrier to HIV prevention and care. A qualitative study focusing on the use of social support among MSM in Lesotho[33] suggested that increasing social media implementation to reflect MSM in a nondiscriminatory fashion and increasing sensitivity toward gay/transgender communities may lead to the discouragement of homophobia and homoprejudice. Social media and advertisement campaigns, such as these have been successfully implemented in South Africa, where integration of gay and transgender characters in population television shows have been shown to normalize MSM relationships within a nondiscriminatory lens.[34]

In qualitative studies from SSA, MSM health service users have reported experiences of discrimination by healthcare providers, noting providers' disapproval of sexual orientation and sexual behavior in addition to provider lack of knowledge regarding MSM's sexual health.[35,36] To facilitate more culturally and clinically competent environments, trainings have been completed across SSA for clinical providers and clinic staff that provide comprehensive, integrated education on sexual orientation, disclosure, and gender identity to promote quality healthcare among sexual minorities.[35–38] Provider education interventions throughout SSA have been found to significantly improve sexual health knowledge regarding MSM and reduce discriminatory and homophobic fallacies among providers.[39,40] Providers also reported that educational training programs helped raise awareness of psychosocial vulnerabilities in relation to discrimination and sexual behavior stigma within medical settings,[41,42] as well as social and behavioral risks of HIV among MSM.[42] However, there is variation noted in the impact of these types of trainings, with a common finding being an immediate improvement in self-reported acceptability of sexual and gender minorities by clinical providers that decays over time. Overcoming the decay likely necessitates ongoing interventions and the earlier introduction of these trainings during the education of health professionals, including medical and nursing school as well as education of allied health professionals.[6,43,44] In addition, a prior systematic review of this literature found that the topics that should be included in sensitivity training have and should change over time, such as how current trainings focus more on ART adherence and community engagement among MSM in SSA.[38]

The scale-up of pre-exposure prophylaxis (PrEP) and undetectable = untransmittable (U = U) communication across SSA was initiated by WHO in 2016 regardless of CD4 count.[45] These guidelines were mirrored by the Joint United Nations Program on HIV/AIDS in 2020,[46] identifying MSM living in SSA as a key population requiring additional country-level HIV prevention efforts focused on increasing PrEP and U = U communication between patient and healthcare provider. A recent study of serodiscordant couples in Kenya and Uganda found that ART adherence faltered because there were concerns about infection without other measures of protection (PrEP, condoms), and that viral suppression due to ART adherence was commonly misunderstood.[47] Though literature outlining the knowledge and awareness of U = U in SSA is limited, available research suggests that MSM are relatively unaware of U = U campaigns and messages[48] and think about HIV prevention and treatment as separate entities.[49] Thus, it remains likely that these associations remain relevant within the current context given the limited knowledge of U = U campaigns among this population. The scale-up of PrEP among MSM in SSA, however, may impact the findings of this study, as a scale-up may be associated with an increase in HIV testing availability and by association, access to HIV treatment. However, stigma related to sexual behavior likely has not been affected by the scale-up of PrEP and may in fact become a more important barrier as other barriers may shift and be removed.

In a recent systematic review,[2] authors outlined the potential for the implementation and success of HIV self-testing among key populations at increased risk for HIV infection. When implemented in Senegal, self-testing has had high uptake; 94.3% of a sample of first-time testers and those who had not been tested within the past year engaged in HIV self-testing when given the opportunity in a recent study in

Senegal.[16] While increasing clinical and cultural competence facilitating disclosure is vital, also increasing the availability and uptake of HIV self-testing may mitigate the reported barriers in this study to access related to a desire to conceal sexual orientation or practices from healthcare providers. Disclosure, for instance, has been linked to instances of sexual behavior stigma in both family and friends, and within healthcare settings, and by association may impact comfortability in HIV prevention and testing. In a recent study conducted among five SSA countries,[50] MSM who disclosed their same-sex sexual behaviors to both family members and healthcare workers (as compared to MSM who had disclosed to neither) were more likely to both express being afraid of and to avoid seeking out health services due to the possibility someone could learn that that they have sex with men. They also had more than three times the odds of reporting a healthcare worker had gossiped about them and of feeling mistreated at a health center if they had disclosed to both with a smaller association observed for those who had only disclosed to healthcare workers.[51] This was consistent with results from Myanmar, where MSM noted confidentiality, privacy and the opportunity to avoid stigma as some major advantages of HIV self-testing.[52] In general, however, there has been limited study on how best to deliver novel diagnostic strategies for marginalized communities across SSA, including cis-MSM and transgender women to increase uptake of testing, representing another unmet need and priority for research and programs.

Our study has important limitations and notable strengths. First, the current analysis features secondary data validated by the Senegal government for public release in 2018. Additional publication delay occurred due to a long period of the article being under review and changing positions and institutions among the authorship team. Although interviews were conducted in both French and Wolof, interviewer administered questionnaires are susceptible to social desirability bias. Second, participants were offered incentives to recruit other participants (RDS) which may be more susceptible to selection bias when compared to venue-based sampling approaches. Concurrently, recruitment occurred in urban areas and therefore these findings may not be generalizable to rural areas in Senegal. There is temporal ambiguity in the association between stigma and healthcare outcomes due to the nature of cross-sectional data. Since eligibility criteria included having sex with a man in the last year, and this study includes trans women who have sex with men, findings may not represent trans women who do not have sex with men. Since completion of this study, HIV testing rates in Senegal have increased due to the use of HIV self-testing kits,[16,53] however, this study remains relevant and informative in Senegal and SSA where HIV testing uptake remains limited.[16,53] Similarly, it is possible that social desirability limited report of sexual practices associated with stigma and may have attenuated observed relationships with testing. Finally, we decided against categorizing participants by depression score because we anticipated the relationship under investigation may not only operate for those who are depressed versus those who are not but may exhibit a continuous graduated relationship. As a secondary analysis, data collection was not designed to be powered for this specific analyses, so that, a sample size calculation was not conducted. Strengths include the treatment of stigma as a multi-dimensional construct and multiple recruitment sites throughout the country (Dakar, Mbour, and Thiès).

Conclusion

The HIV epidemic in Senegal is heavily concentrated among cis-MSM and transgender women, consistent with countries across West and Central Africa. The first step toward reducing HIV burden in these populations is appropriate identification of HIV infection, which is potentially hindered by a lack of disclosure of sexual orientation in healthcare settings, and forms of stigma that may be related to depression. Combining results presented here with earlier data from Senegal and across SSA suggests that friendlier, stigma-free medical and screening environments remain the key to disclosure, while also exploring other strategies for increasing testing uptake in populations that may be marginalized from the healthcare system. It is also imperative to highlight that this study evaluated barriers to HIV testing prior to the COVID-19 pandemic, which we know has since exacerbated these barriers among MSM. Therefore, utilizing programs that increase HIV testing in a supportive environment, while mitigating intersectional HIV and sexual behavior-related stigmas, is likely central to a comprehensive and impactful HIV response among key and marginalized populations, such as cis-MSM and transgender women in Senegal and beyond.

Author contributions

The original study conception, design, and funding was appropriated by Stefan Baral (Principal Investigator). Carrie Lyons oversaw original data collection. Material preparation and data management, and cleaning were conducted by Oluwasolape Olawore. Matthew Beymer, Sarah Murray, and Shauna Stahlman analyzed and interpreted data, while Matthew Beymer, Sarah Murray drafted the first version of the manuscript. Kate Dibble led creating a second version of the manuscript based on the first, with the support of Sarah Murray and Stefan Baral. All authors above as well as Cheikh Ndour, Gnilane Turpin Nunez, Coumba Toure-Kane, Nafissatou Leve Diouf, Daouda Diouf, Fatou Maria Drame, and Souleymane Mboup have reviewed and edited the results and interpretation of the analyses. All authors have read and approved the final version of this manuscript prior to submission. This manuscript has been submitted solely to this journal and is not published or submitted elsewhere.

Declaration of conflicting interests

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Ethical approval

Ethical approval for this study was obtained from the Johns Hopkins Bloomberg School of Public Health (JHSPH) Institutional Review Board (IRB) and the National Research Ethics Committee in Senegal (IRB approval #00005832).

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Informed consent

Written informed consent was obtained from all subjects before the study.

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Supplemental material

Supplemental material for this article is available online.

References

1. World Health Organization. Global Health Observatory (GHO) data—HIV, 2021, http://www.who.int/gho/hiv/en/
2. Eshun-Wilson I, Jamil MS, Witzel TC, et al. A systematic review and network meta-analyses to assess the effectiveness of HIV self-testing distribution strategies. *Clin Infect Dis* 2021; 29: 1–11.
3. Poteat T, Ackerman B, Diouf D, et al. HIV prevalence and behavioral and psychosocial factors among transgender women and cisgender men who have sex with men in 8 African countries: a cross-sectional analysis. *PLoS Med* 2017; 14(11): e1002422.
4. MacCarthy S, Poteat T, Xia Z, et al. Current research gaps: a global systematic review of HIV and sexually transmissible infections among transgender populations. *Sexual Health* 2019; 14(5): 456–468.
5. Poteat T, Diouf D, Drame FM, et al. HIV risk among MSM in Senegal: a qualitative rapid assessment of the impact of enforcing laws that criminalize same sex practices. *PLoS ONE* 2011; 6(12): e28760.
6. Lyons CE, Ketende S, Diouf D, et al. Potential impact of integrated stigma mitigation interventions in improving HIV/AIDS service delivery and uptake for key populations in Senegal 2017; 74(S1): S52–S59.
7. Stahlman S, Sanchez TH, Sullivan PS, et al. The prevalence of sexual behavior stigma affecting gay men and other men who have sex with men across sub-Saharan Africa and in the United States. *JMIR Public Health Surveill* 2016; 2(2): e35.
8. Stahlman S, Grosso A, Ketende S, et al. Suicidal ideation among MSM in three West African countries: associations with stigma and social capital. *Int J Soc Psychiatry* 2016; 62(6): 522–531.
9. Baral SD, Grosso A, Holland C, et al. The epidemiology of HIV among men who have sex with men in countries with generalized HIV epidemics. *Curr Opin HIV AIDS* 2014; 9(2): 156–167.
10. Stahlman S, Grosso A, Ketende S, et al. Depression and social stigma among MSM in Lesotho: implications for HIV and sexually transmitted infection prevention. *AIDS Behav* 2015; 19(8): 1460–1469.
11. Wendi D, Stahlman S, Grosso A, et al. Depressive symptoms and substance use as mediators of stigma affecting men who have sex with men in Lesotho: a structural equation modeling approach. *Ann Epidemiol* 2016; 26(8): 551–556.
12. Johnson CC, Kennedy C, Fonner V, et al. Examining the effects of HIV self-testing compared to standard HIV testing services: a systematic review and meta-analysis. *J Int AIDS Soc* 2017; 20(1): 21594.
13. Turan JM, Bukusi EA, Onono M, et al. HIV/AIDS Stigma and refusal of HIV testing among pregnant women in rural Kenya: results from the MAMAS study. *AIDS Behav* 2011; 15(6): 1111–1120.
14. Stahlman S, Liestman B, Ketende S, et al. Characterizing the HIV risks and potential pathways to HIV infection among transgender women in Cote d'Ivoire, Togo and Burkina Faso. *J Int AIDS Soc* 2016; 19(3 Suppl. 2): 20774.
15. Friedland BA, Sprague L, Nyblade L, et al. Measuring intersecting stigma among key populations living with HIV: implementing the people living with HIV Stigma Index 2.0. *J Int AIDS Soc* 2018; 21(Suppl. 5): e25131.
16. Lyons CE, Coly K, Bowring AL, et al. Use and acceptability of HIV self-testing among first-time testers at risk for HIV in Senegal. *AIDS Behav* 2019; 23(Suppl. 2): 130–141.
17. World Health Organization (WHO). Depression and other common mental disorders: Global health estimates, 2017, https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf
18. Martinez-Perez G, Nabil F, Mbaye E, et al. The psychosocial health needs of bisexual men in Senegal: a research translation experience. *Eur J Public Health* 2020; 30(5): ckaa165281.
19. Drame FM, Peitzmeier S, Lopes M, et al. Gay men and other men who have sex with men in West Africa: evidence from the field. *Cult Health Sex* 2013; 15(Suppl.): 7–21.
20. Abdul-Quader AS, Heckathorn DD, McKnight C, et al. Effectiveness of respondent-driven sampling for recruiting drug users in New York City: findings from a pilot study. *J Urban Health* 2006; 83(3): 459–476.
21. Baral SD, Burrell E, Scheibe A, et al. HIV risk and associations of HIV infection among men who have sex with men in peri-urban Cape Town, South Africa. *BMC Public Health* 2011; 11: Article 766.

22. Fay H, Baral SD, Trapence G, et al. Stigma, health care access, and HIV knowledge among men who have sex with men in Malawi, Namibia, and Botswana. *AIDS Behav* 2011; 15(6): 1088–1097.
23. Baral SD, Trapence G, Motimedi F, et al. HIV prevalence, risks for HIV infection, and human rights among men who have sex with men (MSM) in Malawi, Namibia, and Botswana. *PLoS ONE* 2009; 4(3): e4997.
24. Lyons CE, Grosso A, Drame F, et al. Physical and sexual violence affecting female sex workers in Abidjan, Côte d'Ivoire: prevalence, and the relationship with the work environment, HIV, and access to health services. *J Acquir Immune Defic Syndr* 2017; 75(1): 9–17.
25. Augustinavicius JL, Baral SD, Murray SM, et al. Characterizing cross-culturally relevant metrics of stigma among men who have sex with men across 8 sub-Saharan African countries and the United States. *Am J Epidemiol* 2020; 189(7): 690–697.
26. Grosso AL, Ketende SC, Stahlman S, et al. Development and reliability of metrics to characterize types and sources of stigma among men who have sex with men and female sex workers in Togo and Burkina Faso. *BMC Infect Dis* 2019; 19(1): 208.
27. Kroenke K, Spitzer RL and Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med* 2001; 16(9): 606–613.
28. Adewuya AO, Ola BA and Afolabi OO. Validity of the patient health questionnaire (PHQ-9) as a screening tool for depression amongst Nigerian university students. *J Affect Disord* 2006; 96(1-2): 89–93.
29. *SAS statistic software*. Version 9.4. Cary, NC: SAS Institute, Inc, 2020.
30. Mukandavire C, Walker J, Schwartz S, et al. Estimating the contribution of key populations towards the spread of HIV in Dakar, Senegal. *J Int AIDS Soc* 2018; 21; 6.
31. Qiao S, Zhou G and Li X. Disclosure of same-sex behaviors to health-care providers and uptake of HIV testing for men who have sex with men: a systematic review. *Am J Mens Health* 2018; 12(5): 1197–1214.
32. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011; 365(6): 493–505.
33. Stahlman S, Bechtold K, Sweitzer S, et al. Sexual identity stigma and social support among men who have sex with men in Lesotho: a qualitative analysis. *Reprod Health Matters* 2015; 23(46): 127–135.
34. Pan American Health Organization. Campaigns against homophobia in Argentina, Brazil, Colombia, and Mexico, 2006, https://www.paho.org/en/documents/campaigns-against-homophobia-argentina-brazil-colombia-and-mexico-2006
35. Müller A. Scrambling for access: availability, accessibility, acceptability, and quality of healthcare for lesbian, gay, bisexual, and transgender people in South Africa. *BMC Int Health Hum* 2017; 17(1): 16.
36. Duby Z, Nkosi B, Scheibe A, et al. "Scared of going to the clinic": contextualizing healthcare access for men who have sex with men, female sex workers and people who use drugs in two South African cities. *South Afr J HIV Med* 2018; 19(1): a701.
37. Müller A. Strategies to include sexual orientation and gender identity in health professions education. *African J Health Prof Ed* 2015; 7(1): 4–7.
38. Dijkstra M, van der Elst EM, Micheni M, et al. Emerging themes for sensitivity training modules of African healthcare workers attending to men who have sex with men: a systematic review. *Int Health* 2015; 7(3): 151–162.
39. Scheibe AP, Duby Z, Brown B, et al. Attitude shifts and knowledge gains: evaluating men who have sex with men sensitization training for healthcare workers in the Western Cape, Africa. *South Afr J HIV Med* 2017; 18(1): a673.
40. van der Elst EM, Smith AD, Gichuru E, et al. Men who have sex with men sensitivity training reduces homoprejudice and increases knowledge among Kenyan healthcare providers in coastal Kenya. *J Int AIDS Soc* 2013; 16(S3): 18748.
41. Duby Z, Fong-Jaen F, Nkosi B, et al. "We must treat them like all the other people": evaluating the integrated key populations sensitivity training programme for healthcare workers in South Africa. *South Afr J HIV Med* 2019; 20(1): 909.
42. van der Elst EM, Gichuru E, Omar A, et al. Experiences of Kenyan healthcare workers providing services to men who have sex with men: qualitative findings from a sensitivity training programme. *J Int AIDS Soc* 2013; 16(S3): 18741.
43. Lyons CE, Olawore O, Turpin G, et al. Intersectional stigmas and HIV-related outcomes among a cohort of key populations enrolled in stigma mitigation interventions in Senegal. *AIDS* 2020; 34(S1): S63–S71.
44. Wylie K, Knudson G, Khan SI, et al. Serving transgender people: clinical care considerations and service delivery models in transgender health. *Lancet* 2016; 388(10042): 401–411.
45. Wolf RC, Bingham T, Millett G, et al. Building the evidence base to optimize the impact of key population programming across the HIV cascade. *J Int AIDS Soc* 2018; 21(Suppl. 5): e25146.
46. UNAIDS. *HIV prevention 2020 road map*. Geneva: UNAIDS, 2017.
47. Wyatt MA, Pisarski EE, Baeten J, et al. Users may lack confidence in ART for HIV prevention: a qualitative analysis. In: *Conference on retroviruses and opportunistic infections (CROI)*, 2017, https://www.croiconference.org/abstract/users-may-lack-confidence-art-hiv-prevention-qualitative-analysis/
48. Mooney AC, Gottert A, Khoza N, et al. Men's perceptions of treatment as prevention in South Africa: implications for engagement in HIV care and treatment. *AIDS Educ Prev* 2017; 29(3): 274–287.
49. Bond V, Hoddinott G, Viljoen L, et al. Good health and moral responsibility: key concepts underlying the interpretation of treatment as prevention in South Africa and Zambia before rolling out universal HIV testing and treatment. *AIDS Patient Care STDS* 2016; 30(9): 425–434.
50. Wiginton JM, Murray SM, Poku O, et al. Disclosure of same-sex practices and experiences of healthcare stigma among cisgender men who have sex with men in five sub-Saharan African countries. *BMC Public Health* 2021; 21: 2206.
51. Wirtz AL, Clouse E, Veronese V, et al. New HIV testing technologies in the context of a concentrated epidemic and evolving HIV prevention: qualitative research on HIV self-testing among men who have sex with men and transgender women in Yangon, Myanmar. *J Int AIDS Soc* 2017; 20(1): 21796.
52. Rouveau N, Ky-Zerbo O, Boye S, et al. Describing, analyzing and understanding the effects of the introduction of HIV self-testing in West Africa through the ATLAS programme in Côte d'Ivoire, Mali, and Senegal. *BMC Public Health* 2021; 21(1): 181.
53. Hamilton A, Thompson N, Choko AT, et al. HIV self-testing uptake and intervention strategies among men in sub-Saharan Africa: a systematic review. *Front Public Health* 2021; 9: 594298.