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Associations between punitive policies and legal barriers to consensual same-sex sexual acts and HIV among gay men and other men who have sex with men in sub-Saharan Africa: a multi-country respondent driven sampling survey

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Author contributions

This manuscript was conceptualized by CL, SM, SB, JOTR, KM. CL, SM, JOTR, KM contributed to the analytical approach. The analyses were led by CL. CL and JOTR accessed and verified the data. JOTR reviewed and duplicated all analyses. The manuscript was drafted and finalized by CL in collaboration with JOTR, KM, SM, SB. JOTR, KM, DD, IMN, IB, AK, UT, BC, MAD, EPO, EK, AS, RN, TC, OKZ, SM, SK, JPE, MK, GM, CB, SM, SB provided a substantive review of the manuscript, contributed to the content, and provided feedback. CL, JOTR, DD, IMN, IB, AK, UT, BC, MAD, EPO, EK, AS, RN, TC, OKZ, SM, SK, JPE, SM, SB contributed to the country-specific study design, implementation, and data collection. CL, SM, SB, JOTR were responsible for the decision to submit the manuscript, and KM, DD, IMN, IB, AK, UT, BC, MAD, EPO, EK, AS, RN, TC, OKZ, SM, SK, JPE, MK, GM, CB supported the decision to submit the manuscript.

Declaration of interests

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SUMMARY

Background: Limited assessments of structural-level factors of HIV affecting gay men and other men who have sex with men (MSM) have been conducted, especially in sub–Saharan Africa. Our objective was to examine HIV testing history, HIV status, and stigmas among MSM living in ten different countries with heterogenous legal environments.

Methods: This study used pooled data from ten country-specific, cross-sectional studies done in 25 sites in Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Guinea-Bissau, Nigeria, Senegal, Eswatini, Rwanda, and Togo. MSM were recruited by respondent-driven sampling and were eligible if they met country-specific requirements for age, area of residence, and self-reported being assigned male sex at birth and having anal sex with a man in the past 12 months. Policy related to same-sex sexual behaviour for each country was categorised as not criminalised or criminalised. Countries were also categorised on the basis of recent reports of prosecutions related to same-sex sexual acts. Legal barriers were defined as those that legally prevented registration or operation of sexual orientation related civil society organisations (CSOs). Individual data on HIV testing history, HIV status, and stigma were collected via interviewer administered sociobehavioural questionnaires and HIV testing. Multilevel logistic regression with random intercepts was used to assess the association between policies, recent prosecutions, legal barriers to CSOs, and HIV-related factors with adjusted odds ratios (aORs) and 95% CIs.

Findings: Between Aug 3, 2011, and May 27, 2020, we recruited 8047 MSM with a median age of 23 years (IQR 21–27). 4886 (60·7%) lived in countries that criminalise same-sex sexual acts. HIV prevalence among MSM was higher in criminalised settings than non-criminalised settings (aOR 5·15, 95% CI 1·12–23·57); higher in settings with recent prosecutions than in settings without prosecutions (12·06, 7·19–20·25); and higher in settings with barriers to CSOs than without barriers to CSOs (9·83, 2·00–48·30). HIV testing or status awareness was not associated with punitive policies or practices. Stigma was associated with HIV status but did not consistently vary across legal environments. Disparities in HIV prevalence between MSM and other adult men were highest in punitive settings.

Interpretation: Structural risks including discriminatory country-level policies, prosecutions, and legal barriers may contribute to higher HIV prevalence among men who have sex with men. Taken together, these data highlight the importance of decriminalization and decreasing enforcement, alongside stigma reduction, as central to effective control for HIV.

INTRODUCTION

Globally, gay men and other men who have sex with men (MSM) are disproportionately affected by HIV with recent estimates suggesting MSM are about 25 times more likely to be living with HIV than other adult men.[1] Even in countries across sub-Saharan Africa where the HIV epidemics are more generalized, estimates are as high as nearly one in two MSM to be living with HIV.[2] For MSM, HIV risks are shaped by individual, network, social, and structural factors that include stigma and discrimination related to sexual behavior, orientation, or preferences. Stigma is a social process by which an individual or group is labeled and devalued based on a perceived characteristic, resulting in adverse experiences, limited opportunities, and suboptimal wellbeing in the context of unequal power.[3] Stigmas can arise from limited understanding, tolerance, and acceptance of diverse identities, behaviors, or health conditions.[4] Stigmas may manifest at the individual, community, and structural- or macro-levels, and through prejudice, discounting, discrediting, and discrimination.[5]

The role of individual and community-level stigmas as barriers to HIV outcomes has been well established,[5,6] though assessments of structural stigmas and discrimination and their relationship to individual-level health outcomes have been limited. This is likely on account of the complexity of how structural stigmas manifest and the limited individual-level data from multi-country studies available to properly assess these factors alongside HIV outcomes.[7] Structural stigma is a macro-social form of stigma acting at the level of policies, systems, and structures.[5] At the structural or macro-levels, laws serve multiple roles. Laws may reflect the dominant norms of a given society and seek to shape a population's behavior to meet those norms, but it also has an "expressive" function in which law shapes social norms.[8] As such, laws and policies can be both a means through which social stigma is created or enforced and a means of remedying or preventing stigma and blunting its harms.[9]

Anti-Lesbian Gay Bisexual Trans (LGBT) legislation and enforcement functions at the structural-level to discriminate against individuals based on sexual orientation, behaviors, or preferences. An online survey conducted among MSM from 38 European countries

found that in countries with more stigmatizing laws and policies, MSM were less likely to report same-sex attractions, sexual behaviors, and sexual identities than countries with less stigmatizing laws and policies.[10] Non-disclosure of sexual behaviors has been shown to negatively impact HIV prevention, diagnosis, and treatment, and disclosure of sexual behaviors to healthcare providers is essential to informing appropriate care.[11] A recent systematic review and meta-analysis of studies conducted in sub-Saharan Africa observed that levels of testing history and awareness of HIV status were lower in countries with the most severe legislation compared to countries with the least severe legislation.[12] A cross-national global ecological analysis showed that countries with LGBT criminalizing laws and policies had lower levels of knowledge of HIV status and lower HIV viral suppression among people living with HIV.[13] Despite these existing findings, the current evidence is limited to aggregate-level analysis as none of the existing studies have directly assessed the association between punitive legal environments and HIV outcomes utilizing individual-level data, especially in sub-Saharan Africa.

In settings with punitive policies like the criminalization of same-sex sexual acts, civil society organizations (CSO) may serve a protective function by enacting health services and advocacy to shape policies, funding, and programs for devalued communities such as MSM.[14] For instance, the involvement of CSOs and communities of people living with HIV were central in scaling up the HIV response globally.[15] However, many countries have legal barriers to the operation and registration of CSOs to support sexual and gender diverse efforts, impeding access to care and services among individuals at risk for and living with HIV.[16]

Recognizing stigma as a barrier to HIV prevention, diagnosis, and treatment, the Joint United Nations Programme on HIV/AIDS has established the goal of achieving zero discrimination by 2025 to support eliminating HIV as a public health threat by 2030. UNAIDS has also established the 10-10-10 targets which focus on removing social and legal impediments to support access and utilization of HIV services.[17] However, there remains a critical need to characterize the mechanisms by which structural stigma and discrimination harm the HIV response in order to inform intervention strategies. In response, this study assessed the associations between discriminatory laws, prosecutions, and legal barriers with HIV prevalence and testing history among MSM across 10 countries in sub-Saharan Africa. We also aim to assess the association between stigmas and HIV and explore if these relationships vary based on the legal environments. Lastly, we assessed the association between punitive environments and HIV prevalence disparities between MSM and other adult men.

METHODS

Data collection and participants

This study used pooled data from ten country-specific, cross-sectional studies done in Burkina Faso, Cameroon, Côte d'Ivoire, Eswatini, The Gambia, Guinea-Bissau, Nigeria, Rwanda, Senegal, and Togo. Study teams led primary data collection in the ten countries. All data were cross-sectional and individuals were recruited and enrolled over the specified time periods for each study between 2011 and 2020. All recruitment was conducted via

respondent driven sampling (RDS) independently across 25 sites within the ten countries.[18] Recruitment chains were initiated by seeds in each site, who were individuals selected in collaboration with local community-based organizations to represent heterogeneity in demographic characteristics and geographic representation.

Participants were eligible if they met country-specific requirements for age, area of residence, and self-reported being assigned male sex at birth and having anal sex with a man in the last 12 months. All participants provided verbal or written informed consent depending on the approach determined for each respective country. Secondary data analysis is overseen by JHSPH IRB approval IRB00007006 and data collection was approved by country-specific ethical committees (appendix p1).

Study teams conducted interviewer-administered questionnaires in a private location with trained study staff. Testing for HIV, including pre- and post-test counseling, was conducted following country-specific national guidelines. HIV testing was conducted prior to administering the socio-behavioral questionnaires. Study staff led post-test counseling and review of HIV test results with participants after completion of the socio-behavioral questionnaire.

Measures

We used individual-level data from socio-behavioral questionnaires and HIV testing for these analyses. The primary dependent variable was HIV status based on HIV test results at the time of RDS participation. Additional HIV measures included self-reported history of ever having received an HIV test and awareness of HIV positive status among those living with HIV.

Individual-level stigmas were explored as exposures of interest. A total of 13 stigma items were administered consistently across countries. These items were combined into separate stigma scales for this analysis based on the results of an exploratory factor analysis and published previously (appendix p2).[19] Stigma categories included stigma related to family and friends; anticipated/perceived healthcare stigma; and general social stigma which are self-reported experiences of stigma attributable to having sex with men.

Other individual-level measures explored as potential confounders include age, education, sexual orientation, marital status, disclosure of same-sex sexual relationships to family or friends, and disclosure of same-sex sexual relationships to a healthcare provider.

Legal environment measures included country-level same-sex sexual practice-related policies, which were defined and categorized based on work developed by the International Lesbian, Gay, Bisexual, Trans and Intersex Association (ILGA)[20] and the HIV Policy Lab[21]. Criminalization of same-sex sexual practices was categorized as not criminalized where national law avoids criminalizing consensual same-sex sex acts; and criminalized in countries where national law criminalizes consensual same-sex sex acts. Prosecutions for consensual same-sex sexual acts was applied to countries where there were reports of prosecutions for consensual same-sex sexual acts within the last year. Categories were determined based on the year of data collection for each respective country. Lastly, legal

barriers to the registration or operation CSOs was defined based on ILGA confirmed reports. Full definitions and sources are outlined in appendix p2–3.

Country-level measures includes HIV epidemic setting, HIV population prevalence, antiretroviral therapy (ART) coverage, and HIV disparity. HIV epidemic setting was defined for each country as either generalized or concentrated, based on UNAIDS and WHO definitions. HIV epidemic setting, HIV population prevalence, and ART coverage for each country was based on UNAIDS estimates. HIV disparity score was calculated as the difference between the HIV prevalence among MSM in each country-specific study sample and HIV prevalence among adult men in each country (appendix p3).

Statistical Analyses

The sample size was determined separately for each country-specific data collection. The sample size for each country was calculated based on the ability to estimate the HIV population prevalence in each setting. We pooled data across countries and sites. We did not apply RDS-adjusted weighting as MSM did not represent a single network, violating a key assumption of RDS.[22,23] While results represent valid sample estimates, they may differ from population-level estimates given lack of full RDS-adjustment.[18] Proportions of demographic characteristics, HIV status, HIV testing history, knowledge of HIV positive status, disclosure, and stigma were described using crude estimates.

The dependent variables of interest are HIV status, HIV testing history, and awareness of HIV positive status. The primary exposures of interest include policy, prosecutions, and legal barriers to CSOs. Potential confounders include age, education, marital status, sexual orientation, epidemic setting, HIV population prevalence, site, year of data collection, and recruitment seed.

We used multilevel logistic regression with random intercepts to estimate odds ratios and 95% confidence intervals (CIs). Final models were adjusted for age, education, marital status, sexual orientation, HIV epidemic setting, ART coverage, HIV prevalence, year of data collection, recruitment seed, site, and clustered by country. We ran separate multivariable models for each policy/prosecution/legal barrier exposure and outcome of interest to avoid potential collinearity (appendix p4).

Secondary exposures of interest are stigma related to family and friends, anticipated/perceived healthcare stigma, and general social stigma. Multilevel logistic regression with random intercepts was used to estimate the odds ratios and 95%CIs between stigma exposures and HIV status. Stigma exposure models were run separately due to potential collinearity between stigma scales. Final models were adjusted for age, education, marital status, sexual orientation, epidemic, HIV prevalence, year of data collection, seed, site, and respective disclosure variables when conceptually relevant. All models were clustered by country. Stigma models were not adjusted for the legal environment, as these measures were conceptualized as modifiers and not confounders (appendix p4).

To explore potential effect measure modification in which the relationship between stigma scales and HIV status might vary depending on the existence of particular policies, the

relationship between stigma scale and HIV status was stratified by policies, prosecutions, and legal barriers to CSOs on same-sex sexual relationships. The Mantel-Haenszel test of homogeneity (MH) was used to assess differences between stigma and HIV across different legal barriers, using a significance level of $p<0.05$.

HIV prevalence disparity was assessed as a dependent variable with policy, prosecutions, and legal barriers to CSOs and exposures of interest. Multilevel mixed-effects generalized linear models were used to assess the exposures and HIV prevalence disparity outcome separately, and models adjusted for country, site, ART coverage, and HIV prevalence.

Statistical analyses were done using STATA 15.1 (College Station, Texas).

Role of funding source

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

RESULTS

Data were collected between Aug 3, 2011, and May 27, 2020. 8047 MSM are represented in these analyses: 672 (8·4%) in Burkina Faso; 1323 (16·4%) in Cameroon; 1301 (16·2%) in Côte d'Ivoire; 326 (4·1%) in Eswatini; 114 (1·4%) in The Gambia; 451 (5·6%) in Guinea-Bissau; 1716 (21·3%) in Nigeria; 737 (9·2%) in Rwanda; 724 (9·0%) in Senegal; and 683 (8·5%) in Togo (appendix 2 p 1). Among participants, 3161 (39·3%) lived in countries where same-sex sexual acts were not criminalised; 4886 (60·7%) lived in countries where same-sex sexual acts were criminalised; 3877 (48·2%) lived in countries with recent prosecutions related to same-sex sexual acts; and 4761 (59·2%) lived in countries with legal barriers to CSOs. The median age of participants was 23 years (IQR 21–27; Table 1).

1581 (19·9%) of 7958 participants with available data were living with HIV (Table 1). In countries without criminalisation, 264 (8·5%) of 3116 participants had HIV, and in countries with criminalisation, 1317 (27·2%) of 4842 participants had HIV (Table 1). HIV prevalence among study participants in criminalised settings was higher than among participants in non-criminalised settings (Table 2). HIV prevalence among study participants in countries with recent prosecutions was higher than in settings without recent prosecutions (Table 2). HIV prevalence among study participants living in countries with barriers to CSOs was higher than in settings without barriers (Table 2).

5895 (73·4%) of 8028 participants with available data reported ever having an HIV test (Table 1). Among 1581 participants living with HIV, 629 (39·8%) reported being aware of their HIV positive status (Table 1). Ever testing for HIV was not associated with policy, prosecutions, or barriers to CSOs (Table 3). Awareness of HIV positive status was associated with CSO barriers (Table 3).

2422 (30·1%) of 8041 participants reported stigma from family or friends, 2064 (25·7%) reported anticipated or perceived health-care stigma, and 4573 (56·8%) reported general social stigma. HIV was associated with stigma from family or friends, anticipated or perceived health-care stigma, and general social stigma (Table 4). The association between

social and family stigma and HIV varied by existence of legal barriers to CSOs, and the association between anticipated or perceived health-care stigma and HIV varied by criminalisation status and recent prosecutions (Table 4).

HIV prevalence difference between study participants and adult men in each country was higher in criminalised settings than non-criminalised settings (Table 5). HIV prevalence difference was higher in settings with recent prosecutions than settings without recent prosecutions and higher in settings with legal barriers to CSOs than settings without legal barriers (Table 5).

DISCUSSION

We explored the relationships between legal environments, types of stigma, HIV testing, HIV status, and awareness of HIV status among MSM living in ten countries across sub-Saharan Africa. Punitive policies against same-sex sexual acts as well as recent prosecutions related to same-sex sexual acts were associated with prevalent HIV among MSM. Extending beyond the criminalization of same-sex sexual orientation, behaviors, and preferences – criminalization of CSOs supporting MSM was also associated with higher HIV prevalence among MSM in this study. Stigma from family and friends, within healthcare, and community were associated with HIV status among MSM but did not consistently change based on the legal environment, highlighting the potentially complex drivers and facilitators influencing stigmas affecting MSM. Lastly, HIV prevalence difference between MSM in this study and other adult men in each respective country was associated with criminalization, recent prosecutions, and legal barriers to CSOs.

Awareness of HIV positive status among MSM living with HIV in this study sample was low, and far from UNAIDS targets for HIV control. Although a high proportion of study participants reported having ever received an HIV test, awareness of HIV status study suggests that study participants may not be accessing HIV tests regularly. For people without HIV, HIV testing services provide opportunities to access prevention services allowing them to remain HIV free; and for people living with HIV, HIV testing facilitates access to ART, achievement of viral suppression, and reduction of onward transmission. Although HIV testing history was not associated with policy, prosecutions, or legal barriers to CSOs, this study suggests regular, routine testing and communication of positive results are needed across legal environments among MSM.

MSM living in settings where prosecutions had been recently documented had 12 times the odds of living with HIV than individuals in settings without recent prosecutions. Additionally, MSM living in criminalized settings had five times the odds of living with HIV compared to men living in settings without criminalization. These results support ecological analyses highlighting differential HIV measures based on criminalization status,[13] and reinforce the harmful role of a punitive context on HIV.[12] These results suggests that the existence of laws, even if the laws are not being actively enforced, may contribute to HIV risk among MSM – and that the burden may be greatest in settings with recent prosecutions. Therefore, while decreasing enforcement may prove helpful, removing laws

and decriminalization may still be important in supporting HIV programming among MSM in sub-Saharan Africa.

This study highlights that CSOs likely play an important role in supporting health services and advocacy efforts for MSM, across criminalized settings.[14] MSM in this study were more likely to be living with HIV in settings with legal barriers to CSO operation and registration. In settings with criminalization, access to legal and health services through CSOs remains an avenue to mitigate barriers to health and human rights.[24] Senegal is an example where CSOs have made progress in achieving access to HIV services for MSM through advocacy efforts and direct care provision.[25] Although same-sex sexual acts and marriage in Senegal remain criminalized, the ministry of health has prioritized efforts toward HIV services for MSM. In South Africa, the early HIV response among MSM was driven by existing social support networks and health services for MSM.[26] Generally, CSOs are well positioned to achieve progress in rights-constrained environments.[25] However, legal barriers to CSOs in the context of punitive policies against same-sex sexual acts provide little opportunities for advancements in HIV and human rights. In 2014, Nigeria increased punitive policies to further criminalize same-sex sexual acts, including prohibiting participation in organizations, service provision, or meetings that support gay people, and punishes attempts to enter civil unions or publicly show same-sex romantic relationships. This law resulted in an immediate effect on fear and avoidance of seeking health services.[27]

Stigma from family or friends, healthcare stigma, and general social stigma were associated with increased HIV prevalence among MSM in this study. The relationship between healthcare stigma and HIV status was higher in settings with recent prosecutions. However, the relationships between general social stigma with HIV did not differ by criminalization status, recent prosecutions, or legal barriers to CSOs. This suggests that stigma experienced by individuals within these domains and its influence on HIV remains a major factor regardless of the legal environment. It also suggests the need to address stigma that occurs at across levels such as intrapersonal-, social-, community-, organizational-, and structural-levels. This differs from studies assessing stigma and HIV across settings with criminalization policies of sex work, which suggest that state actors may be playing a large role in these dynamics.[28] It may be that stigma affecting MSM is driven or facilitated by social context, cultural beliefs and norms more than legal frameworks. For example, despite the establishment of legal protections based on sexual orientation in South Africa in 1994, MSM is South Africa are not less likely to experience human rights abuses when compared to MSM in criminalized settings.[29] This complex dynamic was observed in the United States as well, where although legal protections for MSM exist, the prevalence of stigma is high and not different from MSM across sub-Saharan African countries.[30] Given this, interventions spanning across cultural, gender, religious, and legal spaces are likely needed to improve human rights among MSM. However, social acceptance should not be considered a prerequisite for decriminalization, rather, decriminalization can precede and coincide with community advocacy for improved social acceptance.

Lastly, the difference between HIV prevalence among MSM in this study and adult men in each respective country can serve as a measure of disparity between MSM and non-MSM populations. Punitive policy, recent prosecutions, and legal barriers to CSOs were all

associated with higher HIV prevalence disparities in this study. Structural factors such as criminalization, active prosecutions and enforcement, and barriers to CSO may contribute to disparity in prevention, risk, and ultimately progress of achieving HIV control.

Limitations in this study should be considered. Importantly, all data are cross-sectional and cannot assess causality. RDS is a non-probabilistic-based sampling approach and may introduce selection bias. We adjusted for recruited seed in our analyses but did not apply RDS-weighted adjustments given the limited consensus on this approach for complex, multi-level models. Self-reported measures may be subject to recall bias and social desirability bias which may differ across settings. Measurement variance in the stigma measures across countries exists which may represent potential differential error in measurement by country. Data were collected over a period of nine years, and although we have adjusted for time in which data were collected to account for secular trends, this may not capture all the different ways in which the experiences of MSM and control of HIV may have changed over this period. Enforcement practices beyond arrests, program funding, and other external measures over time may have influenced stigma, HIV status, or HIV risk. It is possible that countries which take a punitive approach towards MSM may also take this approach towards other populations and overall may utilize less public health informed approaches for HIV control. This may result in latent unmeasured confounding which may influence the specific relationships observed in this study. Importantly, ART coverage reduces mortality among people living with HIV and can contribute to a higher prevalence. Therefore, higher HIV prevalence may not always represent poor HIV control. To account for this, we have adjusting for ART coverage and HIV prevalence in our analyses. It is possible that unmeasured confounders preceding both same-sex policies and country-level HIV epidemics may exist and feed independently into both, thus resulting in residual confounding. We cannot rule out the possibility of uncontrolled confounding, particularly as there may be unmeasured confounders which are associated with sexual diverse laws and/or stigma, as well as causally associated with HIV and not in the casual pathway between exposure and outcome. None of the countries in this study met the criteria for decriminalized status, or had protective policies in place, and therefore these legal contexts could not be assessed. Data collection for Eswatini, Burkina Faso, Togo categorization took place in years that are not captured in the HIV Policy Lab Database. ILGA State-Sponsored Homophobia Reports and online media were reviewed for recent prosecutions and did not report any prosecutions in these countries during these years. However, the process for identifying arrests was different from those identified in the HIV Policy Lab database and may be subject to misclassification. MSM living with HIV may experience intersectional stigma due to HIV status and sexual or gender diversity. However, this study did not assess the potential intersections of stigmas attributable to these characteristics. In the development of the disparity score, HIV estimates for adult men were compared to our study sample, which may not account for demographic characteristic of these populations. Importantly, most of the countries included in these analyses are in west and central Africa, with the exceptions of Rwanda and eSwatini. Therefore, these results may not be generalizable across all countries in SSA.

Across sub-Saharan Africa, punitive policies, enforcement practices, and legal barriers to CSOs were associated with a higher HIV prevalence among MSM in this study.

These results provide individual empiric data demonstrating how structural risks and discriminatory policies may contribute to HIV prevalence among MSM across sub-Saharan Africa. This study highlights the potential impact of decreasing enforcement or decriminalization to optimize HIV prevention and treatment efforts. However, this study also highlighted the complexity of stigma affecting MSM– suggesting policy reform alone will not eliminate stigma but interventions addressing social and cultural drivers may support comprehensive stigma reduction.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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RESEARCH IN CONTEXT

Evidence before this study

Globally, gay men and other men who have sex with men (MSM) are disproportionately affected by HIV. The role of individual and community-level stigmas as barriers to HIV prevention and diagnosis has been well established and identified as key barriers to HIV control. However, the assessment of structural stigmas and discriminatory policies on individual-level health outcomes affecting MSM have been limited. We searched PubMed with the terms ""HIV" AND ("Sexual and Gender Minorities" OR "Homosexuality, Male") AND ("Criminal Law" OR "Law Enforcement" OR "Policy" OR "Legislation as Topic" OR "Social Stigma") with no language restrictions, for publications up to December 31, 2021. Anti-Lesbian Gay Bisexual Trans (LGBT) legislation have been associated with non-disclosure of same-sex attractions, sexual behaviors, and sexual identities among MSM. A recent systematic review and meta-analysis of studies conducted in sub-Saharan Africa observed that levels of testing history and awareness of HIV status were lower in countries with the most severe legal penalties related to same sex relations compared to countries with the least severe legal penalties. A cross-national global ecological analysis observed that countries with LGBT criminalizing laws and policies had lower aggregate levels of knowledge of HIV status and lower HIV viral suppression among people living with HIV. Despite these existing findings, the current evidence assessing criminalization of same-sex sexual behaviors affecting HIV outcomes among MSM is limited to aggregate-level analyses and is subject to ecological fallacies as none of the existing studies have directly assessed the association between punitive policies and HIV outcomes utilizing individual-level data.

Added value of this study

This study utilizes individual-level socio-behavioral and biological data from 8,049 MSM from across 10 countries in sub-Saharan Africa including Burkina Faso, Cameroon, Côte d'Ivoire, eSwatini, The Gambia, Guinea-Bissau, Nigeria, Rwanda, Senegal, and Togo to understand the relationship between country-level policies, prosecutions, and legal barriers with HIV testing, prevalence, and status awareness among MSM. This study demonstrates that MSM living in countries which criminalize and enforce discriminatory policies around same-sex relationships have the highest burden of HIV. MSM living in countries which have recent prosecutions related to same-sex sexual acts still have an elevated HIV prevalence compared to countries without recent prosecutions. Furthermore, the presence of legal barriers to CSOs registration and operation was associated with higher levels of HIV.

Implications of all the available evidence

This study contributes to the existing evidence on understanding the role of harmful policies, such as criminalization. Individual-level data from countries across sub-Saharan Africa demonstrated that structural risks including discriminatory country-level policies, recent prosecutions, and legal barriers may contribute to higher HIV prevalence among MSM. These results provide evidence that decriminalization of same sex relationships,

as well as decreasing enforcement of criminalizing policies are central to effective HIV control.

Table 1.

Demographic characteristics among men who have sex with men across ten countries in sub-Saharan Africa, stratified by policy related to same-sex sexual acts

	Total (n=8047)	**Policy related to same-sex sexual relationships**	**Total (n=8047)**
		Not criminalised (n=3161)	Criminalised (n=4886)
Age, years			
<24	4941/7935 (62·3%)	1993/3161 (63·0%)	2948/4774 (61·8%)
25–30	2163/7935 (27·3%)	820/3161 (25·9%)	1343/4774 (28·1%)
≥31	831/7935 (10·5%)	348/3161 (11·0%)	483/4774 (10·1%)
Education level			
None	342/7968 (4·3%)	137/3152 (4·3%)	205/4816 (4·3%)
Some primary	589/7968 (7·4%)	203/3152 (6·4%)	386/4816 (8·0%)
Primary completed or some secondary	3324/7968 (41·7%)	1772/3152 (56·2%)	1552/4816 (32·2%)
Completed secondary or post-secondary	3713/7968 (46·6%)	1040/3152 (33·0%)	2673/4816 (55·5%)
Sexual orientation			
Gay or homosexual	3871/8007 (48·3%)	1733/3147 (55·1%)	2138/4860 (44·0%)
Bisexual	3994/8007 (49·9%)	1313/3147 (41·7%)	2681/4860 (55·2%)
Heterosexual	133/8007 (1·7%)	98/3147 (3·1%)	35/4860 (0·7%)
Other	9/8007 (0·1%)	3/3147 (0·1%)	6/4860 (0·1%)
Disclosure of sexual minority status *			
Disclosure of sexual minority status to family	1784/8033 (22·2%)	758/3161 (24·0%)	1026/4872 (21·1%)
Disclosure of sexual minority status to health-care providers	2113/7333 (28·8%)	548/2487 (22·0%)	1565/4846 (32·3%)
Sexual minority stigmas *			
Stigma from family and friends	2422/8041 (30·1%)	1193/3161 (37·7%)	1229/4880 (25·2%)
Anticipated health-care stigma	2064/8038 (25·7%)	791/3161 (25·0%)	1273/4877 (26·1%)
General social stigma	4573/8046 (56·8%)	1454/3161 (46·0%)	3119/4885 (63·9%)
HIV *			
History of HIV testing among all participants	5895/8028 (73·4%)	2379/3156 (75·4%)	3516/4872 (72·2%)
Living with HIV	1581/7958 (19·9%)	264/3116 (8·5%)	1317/4842 (27·2%)
Ever told of HIV positive status among those living with HIV	629/1581 (39·8%)	102/264 (38·8%)	527/1317 (40·0%)
Currently on antiretroviral among those living with HIV	333/1581 (21·1%)	49/264 (18·6%)	284/1317 (21·6%)

* Items reporting when value = yes and the values for reporting = no, it is not shown

Table 2:

Policy, prosecutions, and legal barriers to CSOs related to same-sex sexual acts and HIV status among men who have sex with men in 10 countries in sub-Saharan Africa

Polices and Legal Barriers			Living with HIV			
	Total		Yes			
	%	N	%	n/N	OR (95% CI)	aOR* (95%CI)
Policy related to consensual same-sex sexual acts						
Not criminalized	39.3	3161	8.4	263/3315	Ref	Ref
Criminalized	60.7	4886	27.2	1317/4842	4.49 (2.05, 9.82)	5.15 (1.12, 23.57)
Prosecutions for consensual same-sex sexual acts						
No	51.8	4170	9.3	385/4120	Ref	Ref
Yes	48.2	3877	31.1	1195/3837	4.92 (2.53, 9.52)	12.06 (7.19, 20.25)
Legal barriers to civil society organizations						
No	40.8	3286	10.4	338/3243	Ref	Ref
Yes	59.2	4761	26.3	1242/4715	2.01 (0.66, 6.10)	9.83 (2.00, 48.30)

*Adjusted for age, education, sexual orientation, marital status, year of data collection, country level population HIV prevalence among adults 15–49, epidemic setting, country-level ART coverage, recruitment seed, site, and clustered by country.

Table 3.

Policy, prosecutions, and legal barriers to civil society organisations related to same-sex sexual acts and HIV testing history among men who have sex with men

	Total (8047)	Has ever tested for HIV among all study participants (n=5895)*			Has awareness of HIV positive status among those living with HIV (n=629)†		
		n/N (%)	OR (95% CI)	aOR‡ (95% CI)	n/N (%)	OR (95% CI)	aOR‡ (95% CI)
Policy related to consensual same-sex sexual acts							
Not criminalised	3161 (39·3%)	2379/3156 (75·4%)	1 (ref)	1 (ref)	102/263 (38·8%)	1 (ref)	1 (ref)
Criminalised	4886 (60·7%)	3516/4872 (72·2%)	0·70 (0·27–1·78)	0·76 (0·25–2·26)	527/1317 (40·0%)	0·65 (0·19–2·21)	0·78 (0·19–3·22)
Prosecutions for consensual same-sex sexual acts							
No	4170 (51·8%)	3034/4160 (72·9%)	1 (ref)	1 (ref)	127/285 (33·0%)	1 (ref)	1 (ref)
Yes	3877 (48·2%)	2861/3868 (74·0%)	0·91 (0·35–2·38)	1·03 (0·34–3·18)	502/1195 (42·0%)	0·88 (0·25–3·03)	1·72 (0·43–6·79)
Legal barriers to civil society organisations							
No	3286 (40·8%)	2408/3278 (73·5%)	1 (ref)	1 (ref)	106/338 (31·4%)	1 (ref)	1 (ref)
Yes	4761 (59·2%)	3487/4750 (73·4%)	1·08 (0·42–2·77)	1·66 (0·52–5·40)	523/1242 (42·1%)	1·61 (0·48–5·50)	4·02 (1·27–12·76)

*Adjusted for age, education, sexual orientation, marital status, year of data collection, country level population prevalence among adults 15–49, recruitment seed, site, and clustered by country.

Table 4:

Stigmas and HIV status among gay men and other men who have sex with men in 10 countries in sub-Saharan Africa

Stigma			Living with HIV												
	Total		Yes		Total sample		Policy related to same-sex sex acts			Prosecutions for same-sex sexual acts			Legal barriers to civil society organizations		
							Not criminalized		Criminalized	No		Yes	No		Yes
	%	n	%	n/N	OR (95% CI)	aOR* (95%CI)	MH p value*	aOR** (95%CI)	aOR** (95%CI)	MH p value*	aOR** (95%CI)	aOR** (95%CI)	MH p value*	aOR** (95%CI)	aOR** (95%CI)
Stigma from family or friends	30.1	2422	22.8	543/1580	1.66 (1.45, 1.89)	1.37 (1.17, 1.60)	0.42	-	-	0.53	-	-	0.0058	1.54 (1.20, 1.97)	1.29 (1.07, 1.56)
Anticipated/ perceived healthcare stigma	25.6	2064	26.6	539/1579	1.52 (1.33, 1.73)	1.49 (1.27, 1.74)	0.0086	1.22 (0.91, 1.64)	1.58 (1.33, 1.88)	0.0015	1.19 (0.92, 1.54)	1.69 (1.41, 2.03)	0.46	-	-
General social stigma	56.8	4573	21.5	747/1580	1.91 (1.66, 2.20)	1.49 (1.26, 1.78)	0.19	-	-	0.087	-	-	0.073	-	-

** Adjusted for age, year, orientation, education, marital status, disclosure of sexual behavior to relevant group^, year of data collection, country HIV prevalence, recruitment seed, site, and clustered by country.

^ Stigma from family or friends included disclosure to family or friends. Anticipated/perceived healthcare stigma included disclosure to healthcare provider. General social stigma included disclosure to healthcare provider.

* The Mantel-Haenszel test of homogeneity (MH) was used to assess differences between stigma and HIV across different policy, enforcement, and legal barriers contexts, using a significance level of $p<0.05$. If the MH p value was not <0.01 then it did not suggest values differed by setting.

Table 5:

HIV prevalence disparity between gay men and other men who have sex with men and other adult men, and associations with legal environments across 10 countries in sub-Saharan Africa

Polices and Legal Barriers	HIV prevalence disparity		
	HIV prevalence disparity score*	HIV prevalence ratio (PR) comparing HIV prevalence disparity score between policy/legal settings	
	Mean PD (sd)	PR** (95%CI)	aPR*** (95%CI)
Policy related to consensual same-sex sexual acts			
Not criminalized	7.22 (3.57)	Ref	Ref
Criminalized	24.82 (13.06)	17.59 (17.13, 18.06)	13.08 (12.73, 13.43)
Prosecutions for consensual same-sex sexual acts			
No	6.58 (4.07)	Ref	Ref
Yes	30.09 (8.63)	23.50 (23.21, 23.79)	18.24 (18.08, 18.40)
Legal barriers to civil society organizations			
No	8.89 (5.69)	Ref	Ref
Yes	24.13 (13.82)	15.25 (14.74 15.74)	16.58 (16.21, 16.95)

*HIV prevalence disparity score is defined as the prevalence difference (PD) between MSM and other adult men in each respective country.

**Generalized linear model was used to assess the legal environment exposures and outcome of interest (HIV prevalence disparity score).

***Adjusted for country, site, country level ART coverage, and country level population prevalence among adults 15–49.