

Beyond adherence: exploring the persistent role of stigma and disclosure in HIV care in Machakos County, Kenya

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Abstract

Aim. This study aimed to investigate the levels of HIV-related stigma and discrimination among people living with HIV (PLHIV) in Machakos County, Kenya, and examine their association with adherence to antiretroviral treatment (ART) and HIV status disclosure, with a focus on the social dimensions influencing HIV care and well-being.

Methods. A cross-sectional study was conducted in four sub-counties in Machakos County among PLHIV receiving care at project-supported health facilities. Multilevel logistic regression models were applied to evaluate associations between stigma, discrimination, ART adherence, and HIV status disclosure.

Results. A total of 1810 PLHIV were included (median age 43.0, IQR: 26.0–53.0; 67.5% female). Overall, 76.7% experienced some form of stigma, with internalized stigma being the most common, particularly among younger individuals, and 19.1% reported discrimination, including within healthcare settings. ART adherence was relatively high (82.6%), and 64.9% reported having disclosed their HIV status to someone. In multilevel logistic regression analysis, stigma and discrimination were negatively associated with ART adherence. In contrast, both stigma and discrimination were associated with a higher likelihood of disclosure. Engagement in positive actions was associated with increased odds of adherence and disclosure.

Conclusion. HIV-related stigma and discrimination remain persistent in Machakos County and continue to undermine optimal treatment outcomes and social well-being among PLHIV. Although ART adherence was relatively high, younger individuals and males showed lower adherence to treatment. Stigma—particularly internalized stigma—and discrimination, including within healthcare settings, were negatively associated with adherence. The relationship between disclosure and stigma appeared complex and context-dependent, reflecting both increased vulnerability and potential access to social support. These findings highlight the need for comprehensive and community-responsive interventions addressing stigma in both healthcare and social settings, while strengthening youth-responsive services and supportive environments for PLHIV.

Introduction

An estimated 40.8 million people worldwide are living with HIV and AIDS, of which 26.3 million in Africa particularly in the Sub-Saharan region, which in 2024, was home to half of all people living with HIV (PLHIV) globally. In the same year, around 31.6 million individuals were receiving antiretroviral treatment (ART), leaving approximately 9.2 million without access to treatment (*Global HIV & AIDS Statistics – Fact Sheet / UNAIDS*, n.d.). Recent analyses suggest that reductions in international aid could significantly undermine progress in HIV prevention and treatment access in Sub-Saharan Africa (*Impact of Two Decades of Humanitarian and Development Assistance and the Projected Mortality Consequences of Current Defunding to 2030: Retrospective Evaluation and Forecasting Analysis - PubMed*, n.d.). One of the countries highly affected by the HIV epidemic is Kenya, with around 1.4 million of PLHIV in 2021 that are

mostly women, adolescents, and young adults (*KASFII_Web22.Pdf*, n.d.; *WAD2021Report.Pdf*, n.d.). Despite marked improvements in terms of survival and reduction of HIV transmission, challenges such as HIV-related stigma and discrimination, and continued new infections among youth remain a significant public health burden (*KASFII_Web22.Pdf*, n.d.; *WAD2021Report.Pdf*, n.d.). In 2022, among the forty-seven counties of Kenya, Machakos was listed in the top 20 for new infections within the young population, with an estimated prevalence of 3.6% (*KASFII_Web22.Pdf*, n.d.) and a stigma and discrimination index of 49.2 (*MACHAKOS-COUNTY-Book-3Aug1.Pdf*, n.d.). Systematic reviews exploring barriers and facilitators to ART adherence in the African context and worldwide showed that patients' adherence is hampered by stigma and discrimination (Katz et al., 2013; Rueda et al., 2016) and is enhanced by disclosure of HIV status (Dessie et al., 2019; Mengesha et al., 2023). However, the enabling role of disclosure might be context-dependant, as it can expose individuals to stigma and discrimination and it remains hindered by the fear of a negative reaction from others (Earnshaw & Chaudoir, 2009; Mitzel et al., 2019; Yigit et al., 2025). The optimal uptake of ART in PLHIV is essential at the individual and collective levels (Attia et al., 2009): ART adherence significantly reduces the viral load (VL) to an undetectable level, interrupting the chain of transmission as summarised by the "Undetectable Equals Untransmittable" (U = U) concept (*Prevention Access Campaign | The Revolution in Living and Loving with HIV*, n.d.). Understanding the perceived or enacted stigma and discrimination among PLHIV is critical. Furthermore, identifying actionable social mitigation strategies can profoundly improve long-term health outcomes for this population. The aim of this study was to investigate the levels of stigma and discrimination among PLHIV in the county of Machakos, Kenya, and evaluate their impact on the patients' adherence to ART and HIV status disclosure. By examining both treatment-related and social dimensions of HIV care, this study seeks to contribute evidence relevant to community-based support, social inclusion, and equitable access to healthcare services, thereby helping to mitigate both the clinical and social impact of the epidemic.

Methods

Study design, setting and population

This cross-sectional study was conducted within the framework of the "By youth side! HIV integrated health services for the young population" project (*Kenya - By Youth Side! - Medicus Mundi Italia*, n.d.). The main goal of the project was to strengthen the integration of healthcare services offered by the public health system with the community and make them more attractive for adolescents and young people. The project was built on three core pillars: i) prevention of new HIV infections; ii) adherence to ART; and iii) fight against stigma and discrimination within communities. This study is embedded in the third pillar. Data were collected between March 2023 and July 2023 across six health facilities in four sub-counties of Machakos County, namely Kangundo, Kathiani, Machakos, and Mwala, located in south-eastern Kenya. Study sites were selected based on a feasibility assessment conducted by project partners in collaboration with the Machakos county Ministry of Health. This assessment considered multiple criteria, including local HIV epidemiology, health system capacity, and the availability and robustness of community-based services. PLHIV who were receiving care in one of the six project-

supported health facilities, aged 10 years or older, aware of their HIV-positive status, mentally competent, and able to read English, were enrolled after providing written informed consent. Additionally, PLHIV were engaged in routine home visits conducted as part of the community-based activities of the National AIDS and STI Control Program (NAS COP) (NHCS, n.d.).

Data collection and management

All data were collected using a printed data collection form distributed by the trained personnel and designed to gather demographic information on study participants, details on adherence to ART, and quantitative data on anticipated, internalized, and/or experienced HIV-related stigma and discrimination (the questionnaire used and definitions are provided in the Supplementary Tables S1 and S2, pg. 1-6). All personnel involved in data collection and analysis completed training in research ethics, received instruction on questionnaire administration, and participated in preparatory focus group discussions prior to field implementation. The data collection forms were pilot-tested by the local personnel to obtain context-specific feedback. The questionnaires were anonymous and manually distributed by trained personnel to the target population. Staff involved in distributing and collecting questionnaires, as well as those accessing clinical data were healthcare providers, or community health workers. All collected data were subsequently entered into the Research Electronic Data Capture (REDCap) digital data capture system by trained personnel (Harris et al., 2009). Data on ART adherence -based on HIV-1 RNA VL measurements were assessed at the health facilities using registries.

When VL results were available within six months from data collection, participants were classified as adherent if the viral load value was below 200 copies/mL. If clinical data were unavailable, access was not consented to, or VL measurements fell outside the six-month window, self-reported adherence was assessed via questionnaire and used as proxy of ART adherence. Self-reported adherence was measured by asking participants: *Thinking about the past 14 days, were there any days where you didn't take your HIV pills?*. Participants who answered "No" were classified as being adherent, while those who answered "Yes" were classified as non-adherent. Adherence to ART was considered the primary outcome variable. The secondary outcome variable was the HIV status disclosure, which was self-reported by participants through the question *Have you ever disclosed your HIV status?*. Response options included "Yes", "No", and *Prefer not to say*. HIV-related stigma and discrimination were examined as predictor variables. Data were collected using adapted items of the Stigma Index 2.0, a validated instrument for measuring stigma and discrimination among PLHIV, which has been widely used in multiple countries, including Kenya (Friedland et al., 2020; *Kenya-SI-2.0-Report-2021.Pdf*, n.d.; *People Living with HIV Stigma Index Implementation Guide*, n.d.). The questionnaire assessed three dimensions of stigma, namely anticipated, internalized and experienced, and three dimensions of discrimination, namely experienced, HIV-staff related and non-HIV-staff-related. For each dimension, participants were classified as experiencing stigma or discrimination if they responded "Yes" to at least one related item; those who responded "No" to all items within a dimension were classified as not experiencing stigma or discrimination. Overall stigma and discrimination were assessed when participants reported experiencing at least one of the stigma or discrimination items. Another dimension

considered was the involvement in any positive action towards people experiencing stigma or discrimination, classified as “Yes” if the participant endorsed at least one relevant item, and “No” if they responded negatively to all items. Additional factors that were considered as potential covariates included gender, age and sub-county. Definitions used for the analysis are provided in the Supplementary Text S1 (pg. 6-7).

Ethical considerations

The study received ethical approval from the National Commission for Science, Technology and Innovation on March 7, 2023 (Ref. number NACOSTI/P/23/23814) and the Amref- Ethical Scientific Review Committee on February 1, 2023 (Ref. number Amref-ESRC P1357/2022). The Department of Health and Emergency of Machakos County authorized the data collection in the target population on March 21, 2023 (Ref. number MKS/DHES/RSCH/VOLI/323). All respondents provided informed consent prior to participation in the study, which included a description of the study’s objectives, procedures, benefits, risks, and their right to withdrawal at any time from the study. For children and adolescents below the age of 18, parental/guardian consent was required only in circumstances where the child/adolescent was accompanied to the clinic with a parent/guardian aware of their HIV status; otherwise, a waiver of consent was granted by the ethical committee. Electronic files and paper questionnaires did not include personal identifiers, except for the informed consent forms and the paper questionnaires of PLHIV agreeing to access their clinical data. All questionnaires and informed consents were securely stored and accessed only by the local study personnel. Electronic data files were encrypted with a record ID number; the password was protected and accessible only by the research team.

Statistical analysis

The sample size was calculated based on data reported in the literature (Arieti, 2026), resulting in a minimum of 600 participants. Descriptive analyses were performed for all variables. Continuous variables were summarised using mean, standard deviation (SD) and median, interquartile range (IQR), while categorical variables were summarised using frequencies and percentages. Associations between variables were assessed using Fisher’s exact test, Chi-squared test, t-test, and Wilcoxon-Mann-Whitney test as appropriate. To evaluate the association of stigma, discrimination, and positive actions with the outcome variables, i.e., adherence and disclosure, multilevel multivariate logistic regression models have been employed. To account for area variation, the models used a mixed-effects approach with sub-county as a random effect variable. To assess the proportion of variance attributable to the sub-county level, the Intraclass Correlation Coefficient (ICC) was calculated for each model. These models were adjusted for age and gender. Age was treated as a continuous variable when included as a covariate in the adjusted models. For the other analyses, age was categorised into two groups: young people aged 10-24 years old and older participants (>24 years old). To assess the associations between stigma, discrimination, and positive actions with age, the same model specification was applied. For all variables included in the analysis, ‘prefer not to say’ responses were treated as missing data and excluded from

the models. All analyses were conducted using Stata software (version 17) and statistical significance was set at $p < 0.05$ (two-sided).

Results

Demographics characteristics of the study population

A total of 1810 PLHIV were included in the analysis. Demographic characteristics of the study population are summarised in Table 1. Most questionnaires were completed by patients attending the six health facilities (80.8%), while 19.2% were administered during home visits. The median age of participants was 43.0 years (IQR 26.0–53.0), and the majority were female (67.5%). Participants were recruited from all the four project-supported sub-counties, with the most residing in Machakos (33.9%) and Kathiani (32.0%). Most participants had attained primary (42.3%) or secondary education (43.5%), nearly half were unemployed (45.5%), and unmarried (50.6%). Most participants reported living with other people (89.5%), with a median household members of 4.0 (IQR 3.0–5.0). In terms of socioeconomic status, almost half of the participants (47.1%) reported being able to meet their basic needs some of the time.

HIV-related stigma, discrimination, and positive actions

Table 2 summarizes the frequencies of stigma, discrimination, and positive actions among the study participants, stratified by age groups. Overall, 76.7% of participants reported experiencing at least one form of HIV-related stigma. Internalized stigma was the most prevalent (71.9%) and was particularly pronounced in the younger population (OR 1.79, 95% CI 1.33–2.40, Supplementary Table S3). Experienced stigma was reported by 17.8% of participants, while 37.5% reported anticipated stigma, with no significant age-related differences observed for these domains (Supplementary Table S3).

In terms of discrimination, 19% of participants reported at least one form of discrimination, with 14.9% of participants having experienced discrimination. Discrimination by HIV-related and non-HIV-related healthcare staff was reported by 9.4% and 1.5% of participants, respectively. No statistically significant difference in discrimination was observed between age groups (OR 0.93, 95% CI 0.70–1.24, Supplementary Table S3).

Regarding the engagement into positive actions, approximately one-third of the participants (33.4%) reported being involved in at least one activity aimed at supporting PLHIV or addressing stigma and discrimination in the previous year. Specifically, 16.0% reported having confronted, challenged, or educated someone who was stigmatizing or discriminating; 21.4% had supported others living with HIV in coping with stigma or discrimination; and 19.2% had participated in organizations or groups working to address stigma (Supplementary Table S4). Engagement in positive actions was 15% higher among younger population (10–24 years old), although the difference was not statistically significant (OR 1.15, 95% CI 0.90–1.46) (Supplementary Table S3).

Adherence to antiretroviral treatment and disclosure

Among 1810 participants, 1783 had available ART adherence data (Supplementary Table S5). Of these, 1473 (82.6%) were adherent to their ART regimen, while 310 (17.4%) were not. Participants younger than 24 years old (OR 0.64, 95% CI 0.48-0.84) and males (OR 0.58, 95% CI 0.45-0.74) were less likely to be adherent to treatment (Supplementary Table S6).

Adherence data were based on molecular tests (VL) taken within 6 months from the administration of the questionnaire for 692 (39%) participants.

Information on disclosure status was available for 1771 participants, of whom 1149 (64.9%) reported having disclosed their HIV status to someone (Supplementary Table S5). Among those who disclosed, 468 (41.0%) had informed their partner and 316 (27.5%) other family members (Supplementary Table S4). Participants younger than 24 years old and males were less likely to disclose their HIV status (OR 0.32, 95% CI 0.25-0.41) (Supplementary Table S6).

The association between HIV disclosure status and treatment adherence was examined among participants with complete data on both variables ($n = 1748$). Among non-adherent participants ($n = 303$), 64.4% reported disclosure, compared to 65.3% among adherent participants ($n = 1445$). The proportion of patients reporting disclosure was nearly identical across adherence groups and no statistically significant association was found between disclosure and adherence ($p = 0.764$).

Adherence to antiretroviral treatment, stigma, and discrimination

Multilevel logistic regression models predicting the odds of adherence to treatment, accounting for clustering at the sub-county level and adjusting for age and gender showed a significant and consistent negative association between stigma and ART adherence (Table 3). Participants reporting stigma (any) had significantly lower odds of adherence compared with those reporting none (OR 0.59, 95% CI 0.42–0.84). Results were comparable for discrimination where participants reporting any discrimination had lower odds of adherence (OR 0.61, 95% CI 0.45–0.82). On the other hand, being engaged in any positive action in response to stigma or discrimination was associated with higher odds of adherence (OR 1.34, 95% CI 1.01–1.77).

For models with adherence to ART as the outcome, the ICC ranged around 0.01, suggesting negligible clustering at sub-county level (Supplementary Table S7).

Disclosure, stigma and discrimination

Multilevel logistic regression models accounting for clustering at the sub-county level and adjusting for age and gender indicated that participants who experienced stigma were more likely to have disclosed their HIV status than those who did not (Table 4) and this association was statistically significant (OR 1.64, 95% CI 1.22-2.22). Similar patterns were observed for discrimination, with participants reporting discrimination more likely to have disclosed their status (OR 1.42, 95% CI 1.08–1.89).

On the other hand, reporting positive actions was strongly associated with higher odds of disclosure (OR 1.77, 95% CI 1.39–2.25). For models with disclosure as the outcome, the ICC was around 0.09, indicating that 9% of the variance was attributable to differences between sub-counties, suggesting a moderate clustering effect at the sub-county level (Supplementary Table S7). Given the limited number of clusters ($n = 4$), no sub-county-level predictors were added to the models. Potential sources of this variation are discussed below.

Discussion

This study was conducted within the framework of the “By youth side! HIV integrated health services for the young population” project and aimed at understanding the effects of stigma, discrimination, and disclosure on adherence to ART. It provides updated evidence on the burden of HIV-related stigma and discrimination and on their associations to ART adherence and HIV status disclosure among PLHIV in Machakos County, Kenya. The findings confirm that HIV-related stigma remains prevalent, with most of the study participants reporting at least one form of HIV-related stigma. Internalized stigma emerged as the most common form of stigma and was particularly pronounced among younger individuals. Nearly one in five participants experienced a form of discrimination, including discrimination within healthcare setting by HIV-related healthcare staff. These results underscore the persistent structural and psychosocial barriers faced by PLHIV and the importance of addressing stigma and discrimination at the community level but also at healthcare level to ensure equitable access to care toward the ambitious goal of ending AIDS by 2030. Despite relatively high levels of ART adherence in the study population, multilevel regression analyses demonstrated a consistent negative association between stigma and ART adherence across all stigma domains, confirming that stigma negatively impact optimal HIV treatment outcomes. These findings are consistent with previous evidence showing that internalized stigma is a significant barrier to ART adherence, especially in adolescents and young people living with HIV (Cluver et al., 2016; MacCarthy et al., 2018; Perger et al., 2025; Toska et al., 2022). Internalized stigma reflects the negative perception and feelings associated with HIV that PLHIV have about themselves and it has been previously associated with poor psychological well-being, HIV sexual risk behavior and lower mental health and social support (Earnshaw & Chaudoir, 2009; Rueda et al., 2016). Discrimination by healthcare staff, was also strongly associated with poorer adherence, underlining the importance of patient–provider relationships in achieving optimal treatment outcomes. As for our study results, while it is plausible that the higher prevalence of perceived discrimination by HIV healthcare staff (9.4%) compared to non-HIV healthcare staff (1.5%) is partly attributable to more frequent contact with the former, these findings highlight that, in a highly stigmatising context such as the one observed in our study, significant efforts must be implemented starting with healthcare personnel. Indeed, healthcare providers should, above all others, contribute to fostering a safe and non-judgmental environment for PLHIV. Beyond their impact on treatment outcomes, the high levels of stigma observed in this study highlight the broader social challenges faced by PLHIV. HIV-related stigma can limit participation in community life, weaken social support networks, and contribute to experiences of marginalization.

These findings suggest that efforts to improve HIV outcomes should extend beyond clinical services and address the social environments in which people live, work, and seek support.

The study further highlights the complex and context-dependent nature of HIV-status disclosure. Unlike findings from other studies in Sub-Saharan Africa (Mengesha et al., 2023), disclosure was not directly associated with improved ART adherence in this population. Instead, disclosure was associated with both increased experiences of stigma and greater engagement in positive actions, such as participation in peer support and stigma-reduction activities. This duality suggests that in highly stigmatizing contexts, disclosure may increase visibility as PLHIV and expose them to increased discrimination. At the same time, disclosure may facilitate access to social support and resources, peer networks, and community engagement opportunities, suggesting that disclosure should be understood not only as an individual health-related decision but also as a determinant of the social process shaped by relationships and community norms. The moderate clustering effect observed at the sub-county level suggests that contextual factors, such as local stigma norms, healthcare quality, and availability of community-based interventions, may influence disclosure patterns.

An important finding of this study was the positive association between engagement in stigma-related positive actions and both ART adherence and HIV-status disclosure. Individuals involved in supporting others living with HIV, participating in community groups, or challenging discriminatory behaviours appeared more likely to engage successfully with HIV care. These findings suggest that community participation and peer engagement may act as protective factors against the negative effects of stigma. Rather than viewing PLHIV solely as recipients of services, these results highlight their role as active contributors to stigma reduction efforts.

Despite some limitations, including the cross-sectional design, the predominance of female participants, and the use of self-reported questionnaires, the study provides valuable community-level insights into stigma, discrimination, adherence, and disclosure in Machakos County. The use of validated tools and trained local research staff further strengthened the quality and contextual relevance of the findings.

Implications for policy and practice

The findings of this study may have important implications for HIV policy and practice in Kenya and similar high-burden settings. First, the persistent prevalence of stigma and discrimination calls for comprehensive stigma-reduction interventions at both community and healthcare levels. In particular, healthcare providers should be equipped through targeted training and accountability mechanisms to foster safe, respectful, and non-judgmental environments for PLHIV. Given the higher levels of discrimination reported from HIV-related healthcare staff, interventions should prioritize improving patient–provider interactions and strengthening ethical and person-centered care practices within HIV services. Second, the results emphasize the need to expand and strengthen youth-friendly HIV services that are accessible, confidential, and responsive to the needs of young people living with HIV. Tailored interventions promoting empowerment, peer support, and engagement in positive social actions may

help mitigate the negative effects of stigma and improve ART adherence. Existing guidelines stress the importance of providing confidential and respectful services to enhance engagement in care (*Making Health Services Adolescent Friendly*, n.d.; TYC, 2022), and further evidence suggests that psychosocial and behavioral interventions are most effective when adapted to patients' perceptions, motivations, and lived experiences (Brittain et al., 2018; Stewart et al., 2023). Therefore, programs should adopt participatory and youth-responsive approaches that integrate mental health support, stigma reduction, and adherence counseling. Finally, disclosure support strategies should be context-sensitive and carefully designed to minimize risks of stigma and discrimination while maximizing opportunities for social support, peer engagement, and improved well-being. Strengthening community-based interventions and addressing contextual disparities across sub-counties may further enhance the effectiveness of HIV services.

Conclusions

This study shows that HIV-related stigma and discrimination remain highly prevalent among PLHIV in Machakos County, Kenya, and continue to effect both healthcare engagement and broader social experiences. While ART adherence levels were relatively high, younger individuals and males showed lower adherence to treatment. Stigma and discrimination were consistently associated with poorer adherence, underscoring their critical role as structural and psychosocial barriers to treatment success. The study highlights also the role of HIV disclosure, which, in this context, was associated with both increased experiences of stigma and engagement in positive actions and support mechanisms.

Taken together, these results call for a comprehensive, multilevel interventions to: i) strengthen stigma-reduction efforts in both community and healthcare settings; ii) improve the quality of patient-provider interactions through training and accountability mechanisms; and iii) expand youth-friendly, safe, and non-judgmental services. Further research should explore the mechanisms linking stigma, disclosure, and adherence, while informing interventions that enhance psychosocial support, empowerment, and overall well-being among PLHIV. Such efforts are essential not only for advancing equitable HIV care, but also for promoting social inclusion and well-being among PLHIV and contributing meaningfully to the achievement of global HIV targets.

Declarations

Author Contribution

FA, MC – study conceptualization and design. FA, CB, AN, AV, LAO - material preparation and ethical review. LAO, AC, SM, JMN, RN, MM - study implementation and data collection. OA, FA, CB – original draft of the manuscript. AN, MM – data cleaning and analysis, review and editing. AN – tables preparation. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Tables

Table 1. Demographic characteristics of the study participants

Total study population	N = 1810
Characteristic	n (%)
Place of completion	
Health facility	1463 (80.8)
Home visiting	347 (19.2)
Age (years)	
Median (IQR)	43.0 (26.0, 53.0)
Missing	20 (1.1)
Gender	
Female	1,221 (67.5)
Male	579 (32.0)
Missing	10 (0.5)
Subcounty	
Kangundo	362 (20.0)
Kathiani	578 (32.0)
Machakos	614 (33.9)
Mwala	256 (14.1)
Education level	
No education	59 (3.3)
Primary	766 (42.3)
Secondary	788 (43.5)
More than secondary	175 (9.7)
Missing	22 (1.2)
Labor status	
Unemployed	823 (45.5)
Employed	581 (32.1)
Student	294 (16.2)
Other	65 (3.6)
Missing	47 (2.6)

Total study population	N = 1810
Characteristic	n (%)
Marital status	
Unmarried	916 (50.6)
Married/cohabitation	782 (43.2)
Missing	112 (6.2)
Living with other people	
Yes	1,621 (89.5)
No	155 (8.6)
Prefer not to say	23 (1.3)
Missing	11 (0.6)
Household members	
Median (IQR)	4.0 (3.0, 5.0)
Missing	191 (11)
Able to meet basic needs	
Never	177 (9.8)
Some of the time	852 (47.1)
Most of the time	329 (18.2)
Always	392 (21.7)
Prefer not to say	42 (2.3)
Missing	18 (0.9)

Table 2. Stigma, discrimination and positive actions: crude and frequency distribution in people living with HIV, stratified by age

Total study population	N = 1810	Age 10-24 N = 422	Age > 24 N = 1362
Characteristic	n (%)	n (%)	n (%)
Overall stigma			
No stigma	405 (22.4)	62 (14.7)	341 (25.0)
Stigma	1389 (76.7)	353 (83.6)	1012 (74.3)
Missing	16 (0.9)	7 (1.7)	9 (0.7)
Internalized stigma			
No internalized stigma	396 (21.9)	65 (15.4)	330 (24.2)
Any internalized stigma	1302 (71.9)	339 (80.3)	939 (69.0)
Missing	112 (6.2)	18 (4.3)	93 (6.8)
Experienced stigma			
No experienced stigma	1162 (64.2)	255 (60.5)	897 (65.8)
Any experienced stigma	323 (17.8)	71 (16.8)	245 (18.0)
Missing	325 (18.0)	96 (22.7)	220 (16.2)
Anticipated stigma			
No anticipated stigma	1017 (56.2)	218 (51.7)	787 (57.8)
Any anticipated stigma	679 (37.5)	166 (39.3)	501 (36.8)
Missing	114 (6.3)	38 (9.0)	74 (5.4)
Overall discrimination			
No discrimination	1456 (80.4)	339 (80.3)	1097 (80.5)
Discrimination	343 (19.0)	78 (18.5)	259 (19.0)
Missing	11 (0.6)	5 (1.2)	6 (0.5)
Experienced discrimination			
No experienced discrimination	1447 (80.0)	327 (77.5)	1103 (81.0)
Any experienced discrimination	270 (14.9)	53 (12.6)	211 (15.5)
Missing	93 (5.1)	42 (9.9)	48 (3.5)
HIV-staff discrimination			
No HIV-staff discrimination	1577 (87.1)	360 (85.3)	1198 (88.0)

Total study population	N = 1810	Age 10-24 N = 422	Age > 24 N = 1362
Characteristic	n (%)	n (%)	n (%)
Any HIV-staff discrimination	170 (9.4)	46 (10.9)	119 (8.7)
Missing	63 (3.5)	16 (3.8)	45 (3.3)
Non-HIV-staff discrimination			
No non-HIV-staff discrimination	1722 (95.1)	384 (91.0)	1312 (96.3)
Any non-HIV-staff discrimination	27 (1.5)	12 (2.8)	15 (1.1)
Missing	61 (3.4)	26 (6.2)	35 (2.6)
Positive actions			
No actions	1141 (63.0)	251 (59.5)	874 (64.2)
Yes, any actions	604 (33.4)	149 (35.3)	447 (32.8)
Missing	65 (3.6)	22 (5.2)	41 (3.0)

Table 3. Multilevel logistic regression model predicting the odds of adherence

Item	OR	95% CI	P-value
Overall stigma	0.59	0.42-0.84	0.003**
Internalized stigma	0.59	0.42-0.83	0.003**
Experienced stigma	0.58	0.42-0.79	0.001**
Anticipated stigma	0.65	0.50-0.84	0.001**
Overall discrimination	0.61	0.45-0.82	0.001**
Experienced discrimination	0.63	0.45-0.87	0.005**
HIV-staff discrimination	0.56	0.38-0.83	0.004**
Non-HIV staff discrimination	0.42	0.19-0.95	0.038*
Positive actions	1.34	1.01-1.77	0.046*

Each row represents results from single-variable age- and gender-adjusted multilevel models with sub-county as a random effect. OR: Odds Ratio, CI: Confidence Interval. *p<0.05, **p<0.001, ***p<0.0001 indicate statistical significance.

Table 4. Multilevel logistic regression model predicting the odds of HIV status disclosure

Item	OR	95% CI	P-value
Overall stigma	1.25	0.97-1.62	0.083
Internalized stigma	1.14	0.88-1.48	0.314
Experienced stigma	1.64	1.22-2.22	0.001**
Anticipated stigma	0.98	0.78-1.22	0.856
Overall discrimination	1.42	1.08-1.89	0.014*
Experienced discrimination	1.25	0.92-1.70	0.158
HIV-staff discrimination	1.40	0.96-2.04	0.080
Non-HIV staff discrimination	2.14	0.80-5.71	0.130
Positive actions	1.77	1.39-2.25	<0.0001*

Each row represents results from single-variable age- and gender-adjusted multilevel models with sub-county as a random effect. OR: Odds Ratio, CI: Confidence Interval. * $p < 0.05$, ** $p < 0.001$, *** $p < 0.0001$ indicate statistical significance.

Supplementary Files

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