

Predictors of Discrimination Towards People Living with HIV/AIDS Among People Aged 15–49 Years in Ethiopia: A Multilevel Analysis

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Background: There is limited national representative evidence on determinants of discrimination towards people living with HIV/AIDS especially, community-level factors that are not investigated in Ethiopia. Thus, this study aimed to assess individual and community-level factors associated with discrimination towards people living with HIV/AIDS among 15–49 age people in Ethiopia.

Methods: A secondary data analysis was done on the 2016 Ethiopian Demographic and Health Survey dataset which was collected cross-sectional. A total of 25,927 weighted 15–49 age people were included in the analysis. Multi-level mixed-effect logistic regression analysis was done by STATA version 14.0 to identify individual and community-level factors. Adjusted odds ratio with 95% confidence interval was used to show the strength and direction of the association and statistical significance was declared at P value less than 0.05.

Results: From individual level factors, being female [AOR=1.47, 95% CI= (1.18, 1.83)], not attend education [AOR=5.88, 95% CI= (4.50, 7.67)], attending primary education [AOR=3.03, 95% CI= (2.40, 3.81)] and attending secondary education [AOR=1.48, 95% CI= (1.19, 1.82)] have discrimination attitude towards people living with HIV/AIDS. From community level factors, live in low proportion of educated communities [AOR=1.33, 95% CI= (1.01, 1.65)], rural dweller [AOR=1.65, 95% CI= (1.23, 2.21)], live in low proportion of HIV tested communities [AOR=1.61, 95% CI= (1.33, 1.93)] were significantly associated with discrimination attitude towards people living with HIV/AIDS.

Conclusion: Sex of the respondent, religion, educational status, household wealth index, marital status, media exposure, internet use, HIV test status, region, and residence, community level of education, and community level of HIV test status were predictors of discrimination attitude towards people living with HIV/AIDS in Ethiopia. Improving educational and community-level HIV/AIDS test coverage are important interventions to reduce discrimination towards people living with HIV/AIDS in the country.

Keywords: discrimination, people living with HIV/AIDS, Ethiopia, multilevel analysis

Introduction

Collaborative international and national efforts during Millennium Development Goals (MDGs), decreases HIV/AIDS-related deaths and infections.^{1,2} The extension of MDGs, Sustainable Development Goals (SDGs), aims to end the HIV/AIDS epidemic by 2030.^{3,4} At the end of 2030, there will be a 90% decline in the number of new HIV infections and AIDS-related deaths.^{5,6}

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The fast-track response sets targets on the HIV treatment cascade: 90% of people living with HIV (PLHIV) knowing their HIV status, 90% of people who know their status receiving treatment, and 90% of people on treatment having a suppressed viral load.^{7,8}

HIV/AIDS is both a medical and social problem. People living with HIV are stigmatized leading to severe social consequences related to their rights, health care services, freedom, self-identity, and social interactions. It also severely hampers the treatment and diagnosis of HIV contributing to the further spread of the disease. Such responses disrupt an individual's social interactions and thereby lead to a feeling of isolation.^{9–16}

AIDS-related discriminations are the product of multiple social influences including attributions of responsibility for HIV infection and beliefs that individuals with HIV/AIDS are contaminated and tainted. The discrimination also reproduces inequalities of class, race, and gender.^{14,15,17–22}

Discrimination greatly affects the quality of life of PLWHA, their family members, and the healthcare providers who work with them.^{8,10,23–27} People who experienced discrimination face loss of income or job, isolation from communities, and inability to participate as a productive member of society.²⁸ Moreover, it is a barrier for ART adherence which accelerates disease progression.^{23,29–32} It increases the risk of mental health problems,^{33–35} hinders the utilization of different HIV/AIDS-related services.^{31,36–38}

Even though, magnitude of discrimination towards PLWHA is reduced in the last decade in Africa, it is still a public health problem which affects the successes of HIV-related programs in the continent.^{39–43}

In Ethiopia, the prevalence of HIV/AIDS-related discrimination is high. In Dessie (41.93%),⁴⁴ Jimma referral hospital (56%),⁴⁵ Oromia (62%),²⁴ Amhara (34%).⁴⁶ Sex of the respondent,^{44,45} residence,^{44,47} non-disclosure of HIV status,⁴⁴ educational status⁴⁵ is some of the factors responsible for HIV/AIDS-related stigma. But, all the studies were done at the local level, use a small sample size, and do not consider the effect of community-level factors. Besides, the association at the individual level may not work at the community-level and vice versa. Even all the studies were fitted with standard logistic regression which may lead them to loss of power. National representative evidence is important to achieve national and international goals. Thus, the current research aimed to determine individual and community level factors affecting

discrimination on PLWHA using multilevel modeling using EDHS 2016 data. It will be important to develop community-level information education communication and behavioral change communication to reduce the prevalence and impact discrimination towards PLWHA in the country.

Methods

Study Setting and Period

The study was conducted in Ethiopia, which is located in the northeastern (horn of) Africa, lies between 3° and 15° North latitude and 33° 48' and East longitudes. EDHS is carried out every five years. The 2016 EDHS was carried out in all parts of Ethiopia, in nine regional states and two administrative regions. 2016 EDHS dataset was collected by the Central Statistical Agency (CSA).⁴⁸ Data were accessed from their URL: www.dhsprogram.com by contacting them through personal accounts after justifying the reason for requesting the data. Secondary data analysis was done on 2016 EDHS among 15–49 aged people who were heard about HIV/AIDS.

A total of 25,927 weighted 15–49 year people were included in the analysis. EDHS 2016 sample was stratified into two stages. The first stratification was done by region and then each region stratified as urban and rural, yielding 21 sampling strata. A total of 645 (202 urban and 443 rural) enumeration areas (EAs) were selected. In the second stage affixed number of 28 households were selected per cluster in equal chance.

Variable Measurement

In this study, the outcome variable (discrimination towards PLWHA) was dichotomized as (Yes/No) which was generated from EDHS-2016.⁴⁹ EDHS-2016 uses two questions to assess the level of HIV/AIDS discrimination (children with HIV should be allowed to attend school with children without having HIV and buy vegetables from a vendor who has HIV). People answering “Yes” for both of the above questions were considered as not having a discrimination attitude towards PLWHA. Otherwise, they were considered as having a discriminatory attitude towards PLWHA. The independent variables were individual-level factors including (sex, religion, marital status, wealth index, educational status, media exposure, internet use, HIV tested) and community-level factors were created by aggregating individual-level factors in each cluster (region, residence, community level

of education, community-level wealth index, community-level media exposure, community level of HIV test).

Data Processing and Analysis

Data cleaning was conducted to check for consistency with the EDHS-2016 descriptive report. Recoding, variable generation, labeling, and analysis were done by using STATA/SE version 14.0. Descriptive statistics were done to describe the study participants about socio-demographic characteristics that were presented in tables and text. Sample weight was used to compensate for the unequal probability of selection between the strata that were geographically defined and for non-responses. Multilevel analysis was conducted after checking the data was eligible for multilevel analysis (by using an intra-cluster correction coefficient). When the ICC is greater than 10% (ICC=36.6%) the community-level factors affect the dependent variable. Therefore, it is better to identify community-level factors to develop and take different interventions. Since EDHS data were hierarchical (individual “level 1” were nested within community “level 2”), a two-level mixed-effects logistic regression model was fitted to estimate both independent (fixed) effects of the explanatory variables and community level random effects on discrimination towards PLWHA. The log of the probability of discrimination was modeled using a two-level multilevel model as follows:⁵⁰ $\text{Log}\left[\frac{\pi_{ij}}{1-\pi_{ij}}\right] = \beta_0 + \beta_1 X_{ij} + B_2 Z_{ij} + \mu_j + e_{ij}$ Where I and j are individual level and community level (2) units, respectively; X and Z refer to individual and community level variables, respectively; π_{ij} is the probability of discrimination for the ith people in the jth community; β 's indicates the fixed coefficients. (B_0) is the intercept, the effect on the probability of discrimination in the absence of influencing factors; and μ_j showed the random effect (the effect of the community on discrimination of the jth community), and e_{ij} showed random errors at an individual level. By assuming each community had a different intercept (B_0) and fixed coefficient (β), the clustered data nature and intra- and inter-community variations were taken into account.

During analysis first, bi-variable multilevel logistic regression was fitted and variables with p-value less than 0.2 at model I, and model II were selected to develop the 3rd model (the final model). The analysis was done in four models. The first model was, model-0 (empty model or null model/without explanatory variable; to secure the need for multilevel analysis). The second model was, model-I (analyzing only individual-level variable), the

3rd model was, model-II (analyzing only community-level variable), the last model, model-III (analyzing both community level and individual level variables based on the cutoff point).

The measure of association (fixed effects) estimates the association between the likelihood of discrimination towards PLWHA and different explanatory factors were expressed by Adjusted Odds Ratio (AOR) with respective 95% confidence level. A P-value less than 0.05 was used as a cut-off point to declare significant association at model-III. The random-effects (variations) were measured by using ICC (model-0), Median Odds Ratio (MOR) in (model-I and II), and Proportional Change in Variance (PCV) was measured to show variation between clusters.

The higher the ICC, the community characteristics are more relevant to understand individual variation. It is calculated as $\text{ICC} = \left(\frac{\delta^2}{\delta^2 + \frac{\pi^2}{3}}\right)$, where δ^2 indicates the estimated variance of clusters. MOR is the median value of the odds ratio between the area at highest risk and the area the lowest risk when randomly picking out two areas and it was calculated as $\text{MOR} = \exp. (\sqrt{2} \times \delta^2 + .6745) \approx \exp^{(0.95\delta)}$. In this study, MOR shows the extent to which the individual probability of discrimination towards PLWHA was determined by place of residence. PCV measures the total variation attributed by individual-level variables and area⁵¹ level variables in the final model (model-III).

It is calculated as $\text{PVC} = [(\delta^2 \text{ of null model} - \delta^2 \text{ of each model}) / \delta^2 \text{ of null model}]$. δ^2 of the null model is used as a reference. Multicollinearity was checked among explanatory variables by using standard error at cutoff point ± 2 . No Multicollinearity is the standard errors were between ± 2 . The log-likelihood test was used to estimate the goodness of fit of the adjusted final model (model-III) in comparison to the preceding models (model-I and model-II) individual and community model adjustments, respectively.

Ethical Approval

Ethical clearance was obtained from Ethical Review Committee of Wollo University College of Medicine and Health Science. An authorization letter was also obtained from CSA for downloading the EDHS data set by requesting the website www.measuredhs.com. The accessed data were used for the registered research only. All data were treated as confidential and no effort was done to identify any household or individual respondent interviewed in the

survey. The detailed information on methodology and the ethical issues was published in the EDHS report.

Results

Characteristics of the Respondents

A total of 25,927 people aged from 15-49 years were included in the analysis. A total of 14,599 of the respondents were female. In total, 9704 (37.4%) of the respondents did not attend school. A total of 13,720 (52.9%) of the population have media exposure and 13,712 (52.9%) of the population did not ever test for HIV (Table 1).

Individual and Community-Level Factors Associated with Discrimination Towards PLWHA

In the final model (model-III) sex of the respondent, educational status, household wealth index, internet use, residence, media exposure, tested for HIV, marital status, region, community level of education, and community level of tested for HIV had a statistical association with discrimination towards PLWHA.

The odds of discrimination towards PLWHA were 1.5 times more among female participants as compared to males [AOR=1.47, 95% CI= (1.18, 1.83)]. The odds of discrimination towards PLWHA were 1.7 times more among participants who are rural residents as compared to urban dwellers [AOR=1.65, 95% CI= (1.23, 2.21)]. People who were not attend education, attending primary education and attending secondary education 6 times, 3 times and 1.5 times more likely discriminate PLWHA when compared with people attending higher education [AOR=5.88, 95% CI= (4.50, 7.67)], [AOR=3.03, 95% CI= (2.40, 3.81)], and [AOR=1.48, 95% CI= (1.19, 1.82)], respectively.

People who live in a low proportion of educated communities were 1.3 times more discriminatory attitudes towards PLWHA than people who live in a high proportion of educated community [AOR=1.33, 95% CI= (1.01, 1.65)]. Women who live in a low proportion of HIV-tested communities were 1.6 times more discriminatory attitudes towards PLWHA than people who live in a high proportion of HIV-tested community [AOR=1.61, 95% CI= (1.33, 1.93)] (Table 2).

Random Effects (Measures of Variation)

Discrimination towards PLWHA varies significantly across each cluster. ICC indicated, 36.6% of the variation in

discrimination attitude towards PLWHA among 15 to 49 age population was attributed to community-level factors. PCV in the final model shows 78% of the variation in discrimination towards PLWHA across communities was explained. Likewise, MOR for discrimination towards PLWHA among the population, in the null model was 28.8 which shows the presence of variation across each cluster (Table 3)

Discussion

The analysis in model-III showed that; Individual-level factors (sex of the respondent, religion, educational status, household wealth index, marital status, media exposure, internet use, and HIV test status) and community-level factors (region, residence, community level of education, and community level of HIV test status) have a significant association with HIV related stigma in Ethiopia.

HIV testing status affects discrimination attitude towards PLWHA at the individual and contextual level in Ethiopia. People who are not tested for HIV/AIDS have a more expressive discriminatory attitude towards PLWHA. Similarly, when a low proportion of people tested for HIV live in the cluster, the contextual level of discrimination towards PLWHA is high. The finding is consistent with previous researches done in Kenya⁵² and Thailand. This might be due to pre-test information and post-test counseling on the key principles of HIV testing and counseling and is expected to create an opportunity to avoid misconceptions about HIV/AIDS. Moreover, during HIV testing clients might get comprehensive information on the availability of different interventions which are essential to correct misconceptions including discrimination. Community-level of HIV/AIDS-related attitudes and knowledge might be high when a high proportion of the community is tested for HIV. HIV testing might initiate a formal or informal discussion about HIV/AIDS among the community, which is a mechanism that has been suggested to have a greater influence on personal knowledge of PLWHA that decreases HIV-related discrimination and risk behaviors related to HIV.⁵² On the other hand, fear of stigmatization and discrimination is a barrier to HIV testing in diverse settings.⁵³⁻⁵⁶ Discussion about HIV/AIDS in informal or formal settings within existing social networks may reduce negative attitudes towards PLWHA.¹⁴

Media exposure and utilization of the internet reduce discrimination towards PLWHA. The finding is consistent with researches done in china.⁵⁷ This might be since the media has an enormous influence on educating and

Table 1 Individual and Community-Level Characteristics of 15 to 49 Age People in Ethiopia, EDHS 2016 (n=25,927)

Variables	Number	Percent
Sex of the respondent		
Male	11,328	43.7
Female	14,599	56.3
Age in year		
15–19	5563	21.5
20–24	4481	17.3
25–29	4700	18.1
30–34	3798	14.6
35–39	3142	12.1
40–44	2386	9.2
45–49	1857	7.2
Religion		
Orthodox	11,615	44.8
Protestant	5987	23.1
Muslim	7802	30.1
Others*	523	2.0
Educational status		
No education	9704	37.4
Primary	10,760	41.5
Secondary	3584	13.8
Higher	1879	7.3
Household Wealth index		
Poorest	3992	15.4
Poorer	4580	17.6
Middle	4947	19.1
Richer	5393	20.8
Richest	7015	27.1
Marital status		
Never married	8511	32.8
Married/union	16,071	62.0
Widowed/divorced	1345	5.2
Media exposure		
Yes	13,720	52.9
No	12,207	47.1
Internet use		
Yes	2296	8.9
No	23,631	91.1
Ever tested for HIV		
Yes	12,215	47.1
No	13,712	52.9

(Continued)

Table 1 (Continued).

Variables	Number	Percent
Residence		
Urban	5708	22
Rural	20,219	78
Region		
Developed	24,824	95.7
Developing	1103	4.3
Community-level of wealth		
A high proportion of rich	16,638	64.2
A Low proportion of rich	9289	35.8
Community-level of education		
A High proportion of educated	7636	29.5
A Low proportion of educated	18,291	70.5
Community-level of media exposure		
A High proportion of exposed	11,157	43
A Low proportion of exposed	14,770	57
Community-level of HIV test		
A High proportion of tested	12,477	48.1
A Low proportion of tested	13,450	51.9

Note: *Catholic and traditional religion follower.

imparting proper knowledge that dilutes pre-existing misconceptions regarding HIV/AIDS.

The community-level and individual level of education affect the acceptance of discrimination towards HIV/AIDS. When educational attainment increases, the acceptance of HIV-related discrimination is reduced. Similarly, when a low proportion of educated individuals live in the cluster, the acceptance of HIV-related discrimination is high. The result is supported by researches in China,⁵⁷ Nigeria,⁵⁸ Dominican Republic,⁵⁹ Haiti,⁵⁹ Botswana,⁶⁰ Ghana.⁶¹ This might be due to educated individuals have access to better information through mass media, the internet, and access to health services related to HIV/AIDS. Moreover, the contextual level of education plays a great role in the reduction of discriminatory attitudes on PLWHA at the community level.

Females have more odds of discrimination towards PLWHA than males in Ethiopia. The finding is similar to findings in china,⁵⁷ Dominican Republic,⁵⁹ Nigeria.^{58,62} The reason might be due to better education, media

Table 2 Multilevel Logistic Regression Analysis of Individual and Community-Level Factors Associated with Discrimination Towards PLWHA in Ethiopia, EDHS 2016 (n=25,927)

Variables	COR (95% CI)	Model-0 ICC=36.6%	Model-I (AOR) (95% CI)	Model-II (AOR) (95% CI)	Model-III (AOR) (95% CI)
Sex of the respondent					
Male					
Female	1.86 (1.56, 2.22)		1.42 (1.15, 1.75)		1.47 (1.18, 1.83)
Age in year					
15–19					
20–24	0.91 (0.79, 1.04)		0.91 (0.79, 1.06)		0.91 (0.79, 1.06)
25–29	1.14 (0.98, 1.33)		0.91 (0.75, 1.09)		0.92 (0.76, 1.11)
30–34	1.39 (1.20, 1.62)		0.84 (0.70, 1.01)		0.86 (0.71, 1.04)
35–39	1.48 (1.26, 1.75)		0.83 (0.67, 1.02)		0.85 (0.69, 1.06)
40–44	1.63 (1.37, 1.93)		0.92 (0.75, 1.13)		0.95 (0.77, 1.18)
45–49	1.83 (1.51, 2.21)		0.99 (0.78, 1.25)		1.02 (0.80, 1.30)
Religion					
Orthodox					
Protestant	1.22 (1.00, 1.50)		1.32 (1.08, 1.61)		1.24 (1.01, 1.52)
Muslim	1.54 (1.25, 1.89)		1.24 (1.06, 1.46)		1.09 (0.92, 1.28)
Others*	1.75 (1.06, 2.90)		1.91 (1.18, 3.08)		1.75 (1.09, 2.81)
Educational status					
No education	11.7 (9.19, 14.80)		6.05 (4.67, 7.82)		5.88 (4.50, 7.67)
Primary	4.72 (3.84, 5.81)		3.06 (2.44, 3.83)		3.03 (2.40, 3.81)
Secondary	1.84 (1.50, 2.26)		1.47 (1.20, 1.81)		1.48 (1.19, 1.82)
Higher					
Household Wealth index					
Poorest	3.83 (3.04, 4.83)		2.09 (1.69, 2.59)		1.45 (1.13, 1.86)
Poorer	3.23 (2.62, 3.99)		2.02 (1.67, 2.44)		1.49 (1.19, 1.87)
Middle	2.61 (2.16, 3.15)		1.77 (1.47, 2.12)		1.34 (1.09, 1.65)
Richer	1.82 (1.50, 2.20)		1.45 (1.21, 1.73)		1.12 (0.91, 1.38)
Richest					
Marital status					
Never married					
Married/union	1.88 (1.70, 2.08)		1.41 (1.23, 1.62)		1.35 (1.18, 1.56)
Widowed/divorced	1.72 (1.41, 2.10)		0.99 (0.80, 1.24)		0.99 (0.79, 1.24)
Media exposure					
Yes					
No	1.99 (1.75, 2.27)		1.20 (1.1, 1.38)		1.18 (1.03, 1.37)
Internet use					
Yes					
No	3.68 (3.07, 4.41)		1.43 (1.16, 1.76)		1.34 (1.09, 1.66)
Ever tested for HIV					
Yes					
No	1.42 (1.29, 1.57)		1.34 (1.20, 1.49)		1.28 (1.15, 1.42)
Residence					
Urban					

(Continued)

Table 2 (Continued).

Variables	COR (95% CI)	Model-0 ICC=36.6%	Model-I (AOR) (95% CI)	Model-II (AOR) (95% CI)	Model-III (AOR) (95% CI)
Rural Region	7.39 (6.26, 8.72)			2.46 (1.96, 3.07)	1.65 (1.23, 2.21)
Developed	I			I	I
Developing	1.95 (1.52, 2.49)			1.16 (0.98, 1.38)	1.40 (1.1, 1.78)
Community-level of wealth					
High proportion of rich	I			I	I
Low proportion of rich	4.64 (3.86, 5.58)			1.40 (1.17, 1.67)	1.17 (0.96, 1.43)
Community-level of education					
A High proportion educated	I			I	I
A Low proportion educated	6.60 (5.60, 7.78)			2.02 (1.64, 2.50)	1.33 (1.07, 1.65)
Community-level of media exposure					
A High proportion exposed	I			I	I
A Low proportion exposed	4.63 (3.85, 5.56)			1.08 (0.89, 1.31)	0.90 (0.74, 1.10)
Community-level of HIV test					
A High proportion tested	I			I	I
A Low proportion tested	5.16 (4.34, 6.13)			1.82 (1.53, 2.16)	1.61 (1.33, 1.93)

Notes: *Catholic and traditional religion follower. Bold numbers are factors associated with HIV-related discrimination in the final model.

exposure, and health service access for males in Ethiopia than female.⁴⁹

Married individuals have a more discriminatory attitude toward HIV/AIDS than singles. This is evidenced by other studies done in China⁵⁷ and Nigeria.⁵⁸ It might be due to most married people live in rural settings in Ethiopia and have not attended school to a high level. Moreover, they might not access the internet, television, and radio due to workload and/living arrangements.

As the household wealth index increases, discrimination on PLWHA is reduced. The finding is supported by researches from Nigeria,⁵⁸ Ghana,⁶¹ Kenya,⁵² Sub-Saharan Africa.⁶³ This might be due to rich peoples may have good health-seeking behavior, better knowledge on HIV, and access different behavioral change communication through mass media or social media. This may change the values and norms of the community towards PLWHA.

Rural dwellers have a discriminatory attitude towards PLWHA than urban residents. The finding is consistent with previous researches in Nigeria,⁵⁸ Turkish,⁶⁴ Dominican Republic,⁵⁹ Ghana.⁶¹ There may be greater access to accurate information about HIV/AIDS in urban settings. When high social support is there, HIV-related discrimination is reduced. Social urbanization might create a big opportunity to mass media exposure, internet access, formal and informal education on HIV/AIDS, comprehensive knowledge on the transmission and prevention mechanisms of the virus.

There is a regional variation on discrimination towards PLWHA in Ethiopia. People who live in developing regions have a discriminatory attitude toward HIV/AIDS than developed regions. In developed regions, there might be accessible health services, educational opportunities, and information on HIV/AIDS. Moreover, cultural,

Table 3 Measure of Variation for Discrimination Towards PLWHA Among 15 to 49 Year People at Cluster Level in Multilevel Logistic Regression Analysis, EDHS 2016

Measure of Variation	Model-0 (Null)	Model-I	Model -II	Model-III
Variance	1.92	0.51	0.45	0.42
ICC (%)	36.6	13.4	12.03	11.32
PCV (%)	Reference	72.9	76.56	78.13
MOR	28.8	4.04	3.71	3.56
Model fitness				
Log-likelihood	-7770.1286	-13684.123	-14408.869	-13375.254

religious values, and norms may be different across the regions. Moreover, people who live in these developing regions of Ethiopia, have poor access to education, media, and health-care facilities. Most pastoralist communities are living in those regions where delivering health and other developmental services has been very difficult, depriving them of awareness of HIV.

The result of this study was more representative than other studies and the model considered different levels of analysis as the outcome was affected by community-level variables. Despite this strength, the result may be prone to recall bias because the data were collected from a history of the event.

Conclusion

After computing multi-level analysis, sex of the respondent, religion, educational status, household wealth index, marital status, media exposure, internet use, HIV test status, region, residence, community level of education, and community level of HIV test status have a significant association with HIV related discrimination in Ethiopia. Improving educational coverage, improving community-level HIV/AIDS test coverage are important interventions to reduce discrimination towards people living with HIV/AIDS in the country. Since discrimination towards PLWHA has differences across the community, better to develop community-sensitive approaches for different communities.

Abbreviations

CSA, Central Statistics Agency; EA, enumeration area; ICC, inter cluster coefficient; MOR, median odds ratio; PCV, proportional change variance.

Data Sharing Statement

The datasets used and/or analysed during this study are available from the corresponding author on reasonable request.

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Disclosure

The authors declare that they have no competing interests.

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