

Research Article

HIV Testing among General Population with Sexually Transmitted Infection: Findings from Myanmar Demographic and Health Survey (2015–16)

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ABSTRACT

Background: Human Immunodeficiency Virus (HIV) testing and counseling is recommended for people with Sexually Transmitted Infections (STIs). In Myanmar, HIV testing and its predictors among those with STI in general population is unknown.

Methods: This is a cross-sectional study using secondary data from Myanmar demographic and health survey 2015–16. We included all women and men aged 15–49 years that reported having STI in the past 12 months. Self-reported HIV testing and its predictors were assessed (using modified Poisson regression with robust variance estimates). We have provided weighted estimates as the analyses were weighted for the multistage sampling design.

Results: Of 998 self-reported STIs, 96 [9.6%, 95% confidence interval (CI): 7.5, 12.1] had been tested for HIV in the past 12 months. Respondents who were residing in hilly regions [adjusted prevalence ratio (aPR): 2.28, 95% CI: 1.29, 4.04] were more likely to have taken the HIV test. However, people in the poorest quintile (aPR: 0.34, 95% CI: 0.12, 0.96) and those who were staying at the current residence for more than 12 months (aPR: 0.45, 95% CI: 0.25, 0.79) were less likely to have taken HIV test.

Conclusion: There is a necessity to promote HIV literacy and HIV testing among those with STI with focus on the poorest populations.

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1. INTRODUCTION

In 2016, there were an estimated 376 million new Sexually Transmitted Infections (STIs) [1]. Having STI increases the risk of acquiring as well transmitting Human Immunodeficiency Virus (HIV). Therefore, provider-initiated HIV testing and counseling is recommended among people with STI [2].

In Myanmar, the focus of National AIDS Programme is on testing key populations, pregnant women (to reduce mother-to-child transmission), people with STI, people with tuberculosis, and prisoners [3]. In 2008, high prevalence of STI (17%) was reported among male highway coach drivers [4]. However, the HIV testing uptake among those with STI still needs to be investigated and it is also not known whether low-risk populations (general population) with STI undergo HIV testing.

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Data availability statement: We do not have the permission to share the data. However, anyone interested can access the data by making a written request to the DHS program. Further details are available in this link <https://dhsprogram.com/data/available-datasets.cfm>.

The Myanmar Demographic and Health Survey (MDHS) 2015–16 reported that 1 in 20 people had self-reported STI in the past 1 year [5]. HIV testing and its predictors among this subset in general population is unknown. Understanding these will aid the program in taking corrective actions and move a step closer (from estimated 53% in 2015) to attain the first ‘90’ of UNAIDS ‘90–90–90’ target by 2020 (90% of people living with HIV know their HIV status).

2. MATERIALS AND METHODS

We conducted a cross-sectional study using secondary data from the MDHS 2015–16 and included all women and men aged 15–49 years that reported having STI in the past 12 months.

The Republic of the Union of Myanmar is a Southeast Asian country neighbored by Bangladesh, India, China, Laos, and Thailand. It is divided administratively into the Nay Pyi Taw council territory, seven states, and seven regions. There are 74 districts and 330 townships. Geographically, states and regions have diversities of plains, delta, and hilly regions. The population size is over 51 million, with nearly 70% residing in the rural areas [6].

Station hospitals (sub-township level) are the first level of facility where doctors are available. Basic health staff, at the level of rural health centers (below station hospital), provide comprehensive primary health care. STI services including a core range of HIV prevention services are delivered through government STI clinics (township level where HIV testing is also available), antenatal services, non-Governmental organization HIV clinics, mobile clinics, and general practitioners providing testing and treatment services.

The nationally representative (urban and rural) MDHS 2015–16 was based on the 2014 census frame and excluded institutional populations, such as persons in hotels, barracks, and prisons, but included those from internally displaced population camps. The survey followed a stratified two-stage sample design.

The first stage involved selecting clusters that were either a census enumeration area or ward/village tracts. Probability proportional to size was used and stratification was achieved by separating each state or region into urban and rural areas, each of which formed a separate sampling stratum. A total of 442 clusters (123 urban and 319 rural) were selected independently from total of 30 sampling strata. Second, a fixed number of 30 households were sampled from each cluster using systematic random sampling. All women aged 15–49 years in the selected households and all men aged 15–49 years in every second selected household were interviewed. The men and women were either residents or visitors who stayed the night before the survey.

Three sets of questionnaires (household, men, and women) were administered. Data collection was carried out by 19 field teams consisting of female and male trained interviewers using a pre-tested paper-based questionnaire in Myanmar language. Among other questions, self-reported STI (having genital sore/ulcer or genital discharge) in the past 12 months and self-reported HIV testing in the past 12 months was also enquired. However, the HIV results were not collected. Comprehensive knowledge of HIV was also assessed. It was considered as ‘yes’ if a person (i) knew about condom use and knew that limiting sexual intercourse to one partner could prevent HIV; (ii) knew that a healthy looking person could have HIV and (iii) rejected the two most common local misconceptions about the transmission of HIV, which included transmission of HIV through mosquitoes and sharing food with a person living with HIV/AIDS.

The survey used computer-assisted field editing procedures with tablet computers simultaneously with the fieldwork. All completed questionnaires were entered into the tablets while in the field by the field editors after they were edited on paper. Reentry of data (100% verification) was done by data-processing personnel in Nay Pyi Taw using the CPro computer package. The validated database report of the survey are available and can be accessed upon request [5].

We analyzed the data using STATA software (version 12.1 STATA Corp., College Station, TX, USA). We assessed HIV testing in the past 12 months among those with STIs using proportions and 95% CI. We used a multivariable model (predictive modeling) to identify independent predictors of HIV testing (outcome of interest) among people with STI. We used modified Poisson regression with robust variance estimates (enter method – all variables included together in a single step). We included age, sex, and variables (socioeconomic, demographic, and comprehensive knowledge of

HIV) with a crude p -value of <0.2 (Chi-square test). These variables have been shown to influence HIV testing among STI patients elsewhere [7]. We ruled out multicollinearity among variables (assessed using variance inflation factor) before including them in the model. We summarized the association between variables included in the model and HIV testing using Adjusted Prevalence Ratio (aPR) and 95% CI.

We have provided weighted estimates as the analyses were weighted for the multistage sampling design. We derived weights using the probability of selection of clusters and households (inverse probability weighting).

We received ethics approval from Ethics Review Committee, Department of Medical Research, Ministry of Health and Sports, Myanmar (Ethics/DMR/2018/163, dated 27 December 2018) and the Ethics Advisory Group of the International Union against Tuberculosis and Lung Disease (The Union), Paris, France (EAG number 38/18 dated 23 August 2018).

3. RESULTS

A total of 998 (5.7%) out of 17,622 people had STI in past 12 months. Of 998, the mean age was 34 (standard deviation: 8.4) years. A total of 214 (21.4%) were residing in hilly regions and 45 (4.5%) moved in to the current residence within past 12 months.

Of the 998 people with STI, 96 (9.6%, 95% CI: 7.5, 12.1) tested for HIV in the past 12 months. Respondents who were residing in hilly regions were more likely to be tested for HIV (aPR: 2.28, 95% CI: 1.29, 4.04). However, people in the poorest quintile (aPR: 0.34, 95% CI: 0.12, 0.96) and those who were staying at the current residence for more than 12 months (aPR: 0.45, 95% CI: 0.25, 0.79) were less likely to be tested. Comprehensive knowledge of HIV was not significantly associated with HIV testing (Table 1).

4. DISCUSSION

This is the first study from Myanmar that assessed HIV testing among people with STI in the general population. The findings are nationally representative and based on a robust dataset (double data entry and validation). The key limitation is the cross-sectional nature of the data where temporality cannot be assessed. Underreporting of HIV testing is possible due to social desirability bias. Residual confounding cannot be ruled out as we only included variables that were available in the MDHS 2015–16.

Human Immunodeficiency Virus testing uptake among people with STI in the general population was low (one in 10 underwent testing). This was similar to findings from Tanzania (16% in 2013) [8]. Lack of perceived seriousness of STI, poor access to HIV testing facilities, and social stigma might have possibly resulted in poor HIV testing among this vulnerable group. Even from developed countries, more than a quarter of those with STI delayed seeking care by more than a week and were more likely to continue risky behavior such as continuing sexual activity without condom use [11].

Moreover, people with STI in the poorest quintile were less likely to undergo testing, which is consistent with findings among people

Table 1 | Independent predictors of HIV testing among general population (age 15–49 years) who reported an episode of STI* in the 12 months, Myanmar Demographic and Health Survey 2015–16[#]

Factors	Total	HIV testing uptake	PR (95% CI)	aPR ^{^^} (95% CI)
	N (Col%)	N (Row%)		
Total	998 (100.0)	96 (9.6)		
Age (years)				
15–19	28 (2.8)	4 (14.2)	1.34 (0.52, 3.48)	1.52 (0.49, 4.65)
20–29	264 (26.5)	34 (12.7)	1.20 (0.78, 1.85)	1.36 (0.79, 2.32)
30–39	383 (38.4)	40 (10.5)	Ref	Ref
40–49	323 (32.3)	18 (5.5)	0.53 (0.31, 0.90) [^]	0.55 (0.30, 1.01)
Gender				
Male	238 (23.8)	32 (13.3)	Ref	Ref
Female	760 (76.2)	64 (8.4)	0.63 (0.42, 0.95) [^]	0.79 (0.45, 1.40)
Education				
No education	115 (11.5)	7 (5.7)	0.31 (0.13, 0.72) [^]	0.85 (0.23, 3.08)
Primary	435 (43.6)	32 (7.4)	0.40 (0.23, 0.68) [^]	1.12 (0.46, 2.70)
Secondary	360 (36.1)	41 (11.3)	0.61 (0.36, 1.03)	0.95 (0.47, 1.95)
Higher education	88 (8.8)	16 (18.6)	Ref	Ref
Region				
Delta and lowland	430 (43.1)	28 (6.5)	Ref	Ref
Hills	214 (21.4)	35 (16.1)	2.50 (1.56, 4.01) [^]	2.28 (1.29, 4.04) [^]
Coastal	91 (9.1)	4 (4.1)	0.64 (0.22, 1.84)	0.82 (0.30, 2.24)
Plains	263 (26.4)	30 (11.3)	1.75 (1.07, 2.87) [^]	1.41 (0.77, 2.57)
Place of residence				
Urban	322 (32.3)	54 (16.9)	Ref	Ref
Rural	676 (67.7)	41 (6.1)	0.36 (0.25, 0.53) [^]	0.59 (0.34, 1.04)
Current marital status				
Never married	41 (4.1)	6 (14.1)	1.45 (0.66, 3.19)	
Married	873 (87.5)	85 (9.7)	Ref	
Widowed	43 (4.3)	5 (10.7)	1.11 (0.46, 2.68)	– [∪]
Divorced	39 (3.9)	<1 (0.4)	0.04 (0.00, 6.14)	
Separated	2 (0.2)	<1 (17.9)	1.84 (0.12, 27.98)	
Occupation				
Not working and/or home maker	217 (21.7)	13 (6.1)	0.28 (0.14, 0.57)	0.49 (0.19, 1.26)
Agriculture	154 (15.4)	11 (6.9)	0.32 (0.15, 0.67)	0.80 (0.27, 2.32)
Manual labor	349 (35.0)	40 (11.6)	0.53 (0.30, 0.93)	1.02 (0.45, 2.30)
Clerical/sales/services	212 (21.2)	19 (8.7)	0.40 (0.21, 0.77)	0.55 (0.23, 1.32)
Professional/technical/managerial	60 (6.0)	13 (21.8)	Ref	Ref
Missing	6 (0.6)	0 (0.0)	–	–
Wealth quintile				
First (poorest)	217 (21.8)	8 (3.6)	0.20 (0.10, 0.42) [^]	0.34 (0.12, 0.96) [^]
Second	197 (19.7)	13 (6.4)	0.36 (0.19, 0.65) [^]	0.57 (0.22, 1.48)
Third	184 (18.4)	16 (8.7)	0.48 (0.28, 0.83) [^]	0.67 (0.31, 1.44)
Fourth	171 (17.1)	18 (10.6)	0.59 (0.35, 0.99) [^]	0.79 (0.41, 1.52)
Fifth	229 (23.0)	41 (18.0)	Ref	Ref
Household size				
1–3	219 (22.0)	18 (8.4)	Ref	
4–6	588 (58.9)	52 (8.8)	1.04 (0.63, 1.74)	– [∪]
>6	191 (19.1)	26 (13.4)	1.59 (0.90, 2.81)	
Move in at this residence within past 12 months				
Yes	45 (4.5)	12 (27.4)	Ref	Ref
No	953 (95.5)	83 (8.8)	0.32 (0.19, 0.54)	0.45 (0.25, 0.79) [^]
Comprehensive knowledge of HIV [^]				
Yes	225 (22.5)	36 (16.1)	Ref	Ref
No	773 (77.5)	60 (7.7)	0.48 (0.33, 0.71)	0.67 (0.39, 1.15)

*Reported STI and/or symptoms of an STI (abnormal genital discharge, and/or a sore or ulcer). [#]Weighted estimates (for multistage survey design) for frequency, proportion and prevalence ratio. [^]Statistically significant ($p < 0.05$). ^{^^}Adjusted analysis using modified Poisson regression with robust variance estimates, six records with missing occupation were excluded from the adjusted analysis. [∪]Current marital status[∪] and “household size” were not included in final model as the crude ($p \geq 0.2$). [^]Composite measure that a person (i) knows about condom use and limiting sexual intercourse to one partner can prevent HIV, and (ii) knows that a healthy looking person can have HIV, and (iii) rejects the two most common local misconceptions about the transmission of HIV, which in Myanmar are that HIV can be transmitted through mosquito bites and that a person can become infected with HIV by sharing food with someone who has AIDS. STI, sexually transmitted infections; col%, column percentage; row%, row percentage; PR, prevalence ratio; aPR, adjusted prevalence ratio; CI, confidence interval; HIV, human immunodeficiency virus.

without STI in Cambodia and Philippines [9,10] The possible reason for this may be delayed health seeking due to financial reasons. Hence, activities to raise awareness regarding seeking care for STI and HIV testing at the nearest township hospital are required especially among the economically marginalized populations. At the same time, the station hospitals and township hospitals should be geared to test (refer for HIV testing to township hospitals in case of station hospitals) all people with STI for HIV.

Residence in hilly terrain and moving into the residence within past 12 months were independent predictors. Interestingly, having comprehensive knowledge of HIV did not affect HIV testing. We are not clear about the reasons for these findings.

To conclude, we found low HIV testing among people with STI in the general population in Myanmar. On the basis of these findings, we recommend studies at various levels of health care—rural health center, station hospital, and township hospital—to investigate the burden of STI among attendees in outpatient departments and of them, the proportion referred for and/or undergoing HIV testing.

CONFLICTS OF INTEREST

The authors declare they have no conflicts of interest.

AUTHORS' CONTRIBUTION

KLS was the principal investigator; HDS, KWYK and KTW were the SORT IT mentors; SH and HNO are the senior authors. All authors were involved in conception, design, inference of results, providing critical review to the manuscript, and approval of the manuscript from this protocol. KLS, HDS and KWYK analyzed the data and prepared the first draft of paper.

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