



# HIV testing uptake and its association with behavior related stigma among key populations in western province, Sri Lanka: a cross-sectional study

Fernando T.S.M<sup>1\*</sup>, Vidanapathirana H.M.J.P<sup>2</sup>

<sup>1</sup> Senior Registrar in Community Medicine, Ministry of Health, Sri Lanka.

<sup>2</sup> Director, Policy analysis and development, planning unit, Ministry of Health, Sri Lanka.

\*Corresponding author: Dr. T.S.M. Fernando, Senior Registrar in Community Medicine, Ministry of Health, Sri Lanka. Email: meksfdo@gmail.com

DOI: <https://doi.org/10.54448/mdnt22206>

Received: 03-21-2022; Revised: 04-18-2022; Accepted: 04-25-2022; Published: 05-02-2022; MedNEXT-id: e22206

## Abstract

**Introduction:** Key populations are at the highest risk of acquiring and transmission of HIV. They are female sex workers, men who have sex with men, drug users, and the transgender community. Since these groups are hard to reach, they have a low HIV testing uptake. A probable reason for this could be the stigma and discrimination vested upon them. **Objective:** The objective of this study was to assess the HIV testing uptake among the KP groups in the Western province in Sri Lanka and their association with behavior related stigma. **Methods:** Four hundred and ninety-eight drug users, 508 female sex workers, 564 men who have sex with men, and 40 transgender people from Colombo, Gampaha, and Kalutara districts were included in the study using respondent-driven sampling. HIV testing uptake was assessed as ever being tested for HIV which was included in the questionnaire to assess factors associated with stigma among key populations. The level of stigma was evaluated by using the behaviour related stigma tool developed and validated by the same researchers. Statistical analysis was done using RDS-A version 7 and SPSS version 22. **Results:** HIV testing uptake among female sex workers was 85.6% (95% CI: 82.3– 88.6) in the sample and the population proportion was 87.1% (95% CI: 84.4 – 89.7). The sample proportion among drug users was 43.0% (95% CI: 38.6 – 47.5) and was 38.6% (95% CI: 31.2 – 46.0) among their estimated total population. High level of behaviour related stigma was negatively associated with HIV testing uptake. It was statistically significant only among men who have sex with men ( $p= 0.04$ ). **Conclusion:** Highest HIV testing uptake was reported from female sex workers and the lowest was reported from drug users. Association between the level of behaviour-related stigma and the HIV testing uptake was

significant only among men who have sex with men.

**Keywords:** HIV testing. Key populations. Stigma.

## Introduction

Key Populations (KP) are the groups that have a high burden of acquiring the Human immunodeficiency virus (HIV) in many settings. According to the United Nations program on HIV/AIDS, the four KP groups considered are sex workers (SW), men who have sex with men (MSM), people who inject drugs (PWID), and the transgender (TG) population (United Nations Programme on HIV/AIDS [1]). These groups are considered a hidden population in both international and Sri Lankan settings. They possess the highest risk of contracting HIV due to many reasons, mainly due to their key behavior. A combination of biological, socioeconomic, and structural factors contributes to the increased risk, vulnerability, and/or burden to acquire HIV infection among KP. Access to relevant services is significantly lower in these groups than in the rest of the population.

Globally, MSM have a 27 times higher risk of acquiring HIV whereas the people who inject drugs have a 23 times higher risk, the FSW have a 13 times higher risk and TG women have 12 times higher risk [2]. In many low and middle-income countries, KP show 15-25 percent higher HIV prevalence rates than that of the surrounding general populations while KP and their sexual partners contribute to 47% of the global HIV burden [2].

Sri Lanka has a low epidemic level of HIV. Its prevalence in the general population is 0.012% [3]. The Integrated Biological & Behavioural Surveillance survey conducted by the NSACP in 2017/2018 revealed that the HIV prevalence was 0.22% among MSM, 0.24% among

FSW, zero among PWID, and 0.48% among TG women (TGW) [4]. However, among the PLHIV diagnosed in 2017, 44% have acquired the infection through heterosexual contacts and 42% through gay or bisexual contacts, and one percent through injecting drugs [5].

Also, KP is adversely affected by stigma and discrimination. This leads to a higher risk of acquiring HIV and limits access to HIV services, limits how these services are delivered, and diminishes their effectiveness [6]. Stigma and discrimination are identified as key obstacles to universal access to HIV prevention, treatment, and care. Stigma among KP lowers the access to health care services and lowers HIV testing among these groups and necessary treatment. Finally, this will result in a hidden epidemic of HIV in the community.

According to the Biological and behavioral surveillance survey, Sri Lanka, 2018, the percentage of FSWs who knew their HIV status in the past 12 months was 29.9%, while it was 40.3% among MSM, 7.7% among PWID, and 36.9% among TGW [4]. Compared to IBBS 2015, there is a decline among PWID and FSW who had got tested during the past 12 months and knew their status, which was 8.7% among PWID and 35.1% among FSW [7]. Therefore, it is evident that the HIV testing uptake among KP in Sri Lanka stands at a low level.

Meanwhile, ending the AIDS epidemic in 2030 has been identified as a key mandate to achieve sustainable development goals [8]. Ministry of Health Sri Lanka is targeting to end the AIDS epidemic by 2025, five years in advance of the targets set by the United Nations [9]. Therefore, it is essential to improve the HIV testing uptake among KP, which is one of the fast-track approaches in the next five years, which is to achieve zero new HIV infections, zero stigmas, and discrimination, and zero AIDS-related deaths to reach the goal of 90% of people living with HIV knowing their HIV status, 90% of people who know their HIV status receiving treatment and 90% of people on HIV treatment having a suppressed viral load [1]. Further, this has been identified as a key area in the National HIV Strategic Plan from 2018 to 2022 as well [10].

Therefore, it is essential to assess the HIV testing uptake among the KP groups and their association with behavior-related stigma. Evidence generated can be used to improve services concerning HIV testing among KP in the Western province of Sri Lanka.

Thus, the objective of the study was to determine the Human Immunodeficiency Virus testing uptake, and its association with behavior-related stigma among key populations in the Western province.

## Methods

### Study Design and Settings

This study followed a prospective observational cross-sectional model, following the rules of clinical research of the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology), available at: <https://www.strobe-statement.org/>. A community-based descriptive cross-sectional study was conducted to assess the level of behavior-related stigma, the HIV testing uptake, and its association with the level of behavior-related stigma among KP in the Western province which is the highest populated province in Sri Lanka. This included 498 DU, 564 MSM, 508 FSW, and 40 TG residing in the Western province. They were recruited from the three districts in the province, Colombo, Gampaha, and Kalutara. The sample size was proportionate to the estimated population of each KP group. The recruitment of participants for the study was done until the desired sample was reached.

### Participants and Informed Consent

Drug users, MSM, FSW, and TG people in the Western province residing in the Western province for the past 6 months, with a valid recruitment coupon, who were above 18 years of age, being able to provide informed consent (not under the influence of alcohol or any other psychoactive substance). We excluded anyone with a diagnosis of a mental disorder at the time of the study. Data collection was carried out from July to November 2018.

Respondent-driven sampling was used as the sampling technique. Six seeds were selected for DU. The number of seeds for MSM and FSW was 11 for each group. Three seeds were selected for TG, one from each district, as the required sample size was small. The number of seeds was selected from three districts in the Western province, proportionate to the population of each KP group and to maintain a diversity of their background. This was done with the aid of the information gathered at the formative assessment. Participants were recruited to the study after checking for eligibility for the study by the principal investigator, following an appointment system.

Behavior-related stigma scale with 17 items, which was developed and validated by the investigators was used to assess behavior-related stigma among KPs in the Western province. Their HIV testing uptake was inquired about by the field investigators. The questionnaires were translated into Sinhala and Tamil and were used where appropriate. Four sociology graduates who had experience in working with KP groups collected data. They were trained as field

investigators. Written informed consent was taken before the study. Confidentiality of the gathered data was ensured.

### Statistical Analysis

Data analysis was done using two software. The population proportion of HIV testing uptake and their 95% confidence interval among each KP group in the Western province was calculated using the RDS-A package (version 7). Stigma was categorized according to the total score obtained by the study participants when answering the stigma tool. In the absence of a proper method to categorize the level of behavior-related stigma in previous literature, it was decided to categorize the level of stigma into high, moderate, or low from the 25th and 75th centile after getting an expert opinion. The participants with scores less than the 25th centile were categorized as a low level while participants with stigma scores between the 25th to 75th centile were categorized as moderate level. The participants with stigma scores above the 75th centile were categorized as having a high level of behavior-related stigma according to the norm referencing system. Since the sample proportion of HIV testing uptake was almost similar to population proportions, the unweighted analysis was done to identify the correlates of behavior-related stigma among all four KP groups. Homophily and convergence of the data collected using RDS sampling were assessed. Through the assessment of homophily, a value less than one indicates a homophilous sample whereas a value more than one indicates a heterophyllous sample. Convergence is the point at which the RDS sample proportions for each

variable no longer change (or change very minimally) regardless of how many more individuals are recruited.

### Results

More than two-thirds of all the four KP groups were between 18 – 49 years of age group and Sinhalese in ethnicity. Nearly half (47%) of the DU sample and nearly 75% of the rest of the three groups (FSW, MSM, and TG) were Buddhists. Ninety-three percent of the DU were employed at the time of the study whereas only 68.4% of the TG population were currently employed during the time of the study. More than 75% of all the four groups in this study have completed their secondary education.

As shown in **Table 1**, the highest proportion of HIV testing uptake was among the FSW population which was 87.1% (n= 435) whereas the HIV testing uptake among the TG population was 44.8% (n=15). Less than half of the DU in the study population (38.6%, n= 214) have ever been tested for HIV while it was 50.4% among the MSM population in the Western province. Since the sample percentages were almost similar to population percentages, the sample values were used to look for the association between HIV testing uptake and behavior-related stigma among key population groups. They are shown in **Table 2**.

While the HIV testing uptake among the three groups in the study (DU, MSM, FSW) except TG was negatively associated with a high level of behavior-related stigma, only HIV testing uptake among MSM was statistically significant (p=0.04).

**Table 1.** HIV Testing Uptake Among Key Population Groups in Western Province.

KP group	Ever been tested for HIV				
	No.	SP	95% CI (SP)	PP	95% CI (PP)
DU (498)	214	43.0	38.6 – 47.5	38.6	31.2 – 46.0
MSM (564)	283	50.2	46.0 – 54.4	50.4	45.5 – 55.3
FSW (508)	435	85.6	82.3 – 88.6	87.1	84.4 – 89.7
TG (40)	15	37.5	22.7 – 54.2	44.8	24.8 – 64.3

SP – Sample proportion

PP\* Population proportion

**Table 2.** The Association Between HIV Testing Uptake and Behaviour related stigma among key population groups in Western province.

HIV testing uptake (Ever tested for HIV)	Level of stigma		Odd's ratio	95% CI	Significance
	High	Low			
	No %	No %			
<b>DU</b>	<b>(n=498)</b>				
Yes	157 (73.3)	57 (26.7)	0.8	(0.5- 1.1)	$\chi^2= 1.8$ , df = 1
No	223 (78.5)	61 (21.5)			p = 0.2
<b>MSM</b>	<b>(n=564)</b>				
Yes	193 (68.2)	90 (31.8)	0.7	(0.5 – 0.99)	$\chi^2= 4.0$ ; df = 1
No	213 (75.8)	68 (24.2)			p = 0.04
<b>FSW</b>	<b>(n=508)</b>				
Yes	323 (74.2)	112 (25.8)	0.8	(0.4 – 1.5)	$\chi^2= 0.5$ ; df = 1
No	57 (78.1)	16 (21.9)			p= 0.5
<b>TG</b>	<b>(n=40)</b>				
Yes	13 (75.1)	02 (24.9)	3.6	(0.7 – 19.9)	p = 0.1*
No	16 (77.7)	09 (22.3)			

\* Fisher's exact test.

## Discussion

Studies done at both the global and national levels have defined the proportion of HIV testing uptake in different ways. In the majority of the studies, it has been identified as the proportion of each KP group "who knew their HIV status for the past 12 months" while in some studies it has been measured as "ever been tested for HIV". However, HIV testing for KP is recommended at least once in three months [11]. However, in this study HIV testing uptake was defined as ever being tested for HIV.

According to the current study, the proportion of HIV testing uptake among DU was 38.6% (95% CI =31.2- 46.0). A study conducted in Cambodia in 2014 revealed that the proportion of PWID who have got tested for HIV in the past six months was 83.3% [12]. However, those results could not be compared due to the difference in the definition of HIV testing uptake in the two studies Other possible reasons for the inability to compare those findings could be that the current study has included all the DU while the Cambodian study has included only PWID.

In the meantime, IBBSs conducted in 2014/2015

& 2017/2018, in Sri Lanka have stated that the proportion of HIV testing of PWID for the past 12 months who knew their status was 7.7% and 8.7% respectively [3,7]. Both IBBS Sri Lanka report values far lower than the current study. This could probably be due to a few reasons. One main reason could be the fact that the current study included all the drug users irrespective of the route of administration while the IBBS has considered only PWID. The other reason for the observed difference could be the difference between the definition of HIV testing uptake considered.

The HIV testing uptake in the current study among MSM was 50.4% (95% CI = 45.5 – 55.3). Nevertheless, according to a study conducted in China, there had been 60.5% of MSM who have ever been tested for HIV. The difference between the current study and the Chinese study could be due to the difference in the study setting. Integrated Biological and Behavioural Surveillance survey 2017/2018, Sri Lanka has reported that the proportion of MSM who knew their HIV status during the past 12 months was 40% compared to 15.4% reported in IBBS 2014/2015. The differences observed between the above-mentioned two IBBS studies and the current study could be due to the difference in the definition of

HIV testing uptake in the three studies.

The proportion of HIV testing uptake among FSW in the Western province as shown in the current study was 87.1% (95% CI = 84.4 – 89.7) which was the highest proportion among the four KP groups. The IBBS conducted in Nepal in 2012 has measured the utilization of HIV testing services for the past 12 months and has reported as 46% [13]. A low trend of HIV testing among FSW was observed in the two IBBSs conducted in Sri Lanka, which was 35.01% in 2014/2015 IBBS [7], and 29.9% in 2017/2018 IBBS [3]. However, the difference in the two proportions of HIV testing in the current study and that of the IBBS could be due to the difference in the definition of HIV testing uptake.

The HIV testing uptake of the TG population in Western province was 44.8% (95% CI:24.8 – 64.3) according to the current study. Nevertheless, the HIV testing uptake among TGW in Malaysia, which was measured as the proportion of ever being tested for HIV was 41.7% [14]. The reason for the difference between the results of the Malaysian study and the current study could be due to the differences in the study setting.

The IBBS 2017/2018 which provides Sri Lankan evidence on HIV testing uptake among TGW, has also measured the awareness of the status of HIV for the past 12 months which was 36.9% [3]. These values lie at a lower level compared to the HIV testing uptake of the current study. Since the current study consisted of several types of TG including trans men, TGW, and androgen, the two results of the above study could not be compared with that of the current study.

Local or international literature containing the association between HIV testing uptake and behavior-related stigma among KP was not found. Therefore, no comparison could be done.

The current study was conducted in the Western province, where the socio-demographic characteristics of the KP differ from those in other provinces in Sri Lanka. Therefore, the level of behavior-related stigma among different KP groups could not be generalized to the entire country. Since there was no proper network formulated for TG populations other than the Venasa network, proper size estimation of this group could not be obtained at the design stage of the study. Hence, an arbitrary sample size of 40 was selected for the TG component in this study. This decision was taken after discussions with the available resources and opinions from the experts in the field. Further, the value of a cross-sectional study design is limited whenever there is a possibility that the dependent variable may change with the participants' risk behavior. Therefore, the absence of information on the temporal relationship may render it difficult to separate the predictor variables

from their outcomes [15].

Hence, this is identified as a limitation of component four of the study. Therefore, results need to be interpreted with caution. According to the nature of the respondent-driven sampling, the non-respondents of the study could not be encountered. The actual non-respondents are being contacted with the participants while enrolling peers in the study. However, those non-respondents could not be contacted by the PI due to their reluctance to divulge their key behavior or gender identity. The precision was taken as 0.06 when calculating the sample size of the descriptive cross-sectional study. Although it may limit the internal validity of the findings, the precision was increased to reduce to sample size due to feasibility issues. The main strengths of the study were using a common tool that was developed and validated in Sri Lanka to assess the level of behavior-related stigma among the four KP groups.

## Conclusion

The highest proportion of HIV testing uptake among all four KP groups in the Western province was among FSW and the lowest reporting from DU. The HIV testing uptake is significantly associated with behavior-related stigma among MSM.

## List of Abbreviations

- AIDS – Acquired Immune deficiency syndrome
- CI – confidence interval
- DU – drug user
- FSW – Female sex workers
- HIV – Human Immunodeficiency virus
- IBBS – Integrated Biological and Behavioral Surveillance survey
- KP – Key populations
- MSM – Men who have sex with men
- PWID – People who inject drugs
- SW – sex workers
- TG – Transgender
- TGW – Transgender women
- UNAIDS – United Nations program on HIV and AIDS
- WHO – World Health Organization

## Acknowledgement

We acknowledge the director of the National STD/AIDS control program, the ministry of health, Sri Lanka, and the participants of the study.

## Ethical approval

Ethical approval was obtained from the Ethics review

committee of the faculty of Medicine, University of Kelaniya, Sri Lanka. ERC no: P/266/11/2017. Informed written consent was obtained from every participant before the commencement of data collection. Participants were given the chance to withdraw at any point from the study, not affecting the health services provided to them. Data collection was done adhering to the steps described in the protocol.

### Data sharing statement

Since the study populations (female sex workers, men who have sex with men, drug users, and transgender community are hard to reach populations and the data collected in this study is highly sensitive, the dataset used for analysis in the study is available with the corresponding author on reasonable request.

### Conflict of interest

The authors declare no conflict of interest.

### Funding

The study was partially funded by the World health organization and Family planning association of Sri Lanka. There was no influence from the above-mentioned institutes during the process of conducting or report writing of this research.

### Authors' contributions

- ✓ Fernando T.S.M.- planning the research, data collection, data analysis, and manuscript writing (principal investigator of the research).
- ✓ Vidanapathirana H.M.J.P – planning the methodology of research, interpretation of data, drafting and finalizing the manuscript. Both the authors have read and approved the final manuscript.

### Similarity check

It was applied by Ithenticate@.

### About the License

© The authors (s) 2022. The text of this article is open access and licensed under a Creative Commons Attribution 4.0 International License.

### References

1. Joint United Nations Programme on HIV/AIDS. UNAIDS data - 2017, Geneva, Switzerland. Retrieved on February, 23, 2018, from [http://www.unaids.org/sites/default/files/media\\_asset/20170720\\_Data\\_book\\_2017\\_en.pdf](http://www.unaids.org/sites/default/files/media_asset/20170720_Data_book_2017_en.pdf)
2. Joint United Nations Programme on HIV/AIDS. Fact sheet – World AIDS Day 2018, Geneva, Switzerland. 2018a, Retrieved January 05, 2019, from <http://www.unaids.org/en/resources/fact-sheet>
3. National STD/AIDS Control Programme. HIV/AIDS Surveillance data in Sri Lanka - Update 4th Quarter, 2018a, Ministry of Health, Colombo, Sri Lanka.
4. National STD/AIDS Control Programme. Integrated biological and behavioural surveillance survey among key populations at higher risk of HIV in Sri Lanka (2017/2018) – report, Ministry of Health, Colombo, Sri Lanka.
5. National STD/AIDS Control Programme. Annual report - 2017, Ministry of Health, Colombo, Sri Lanka.
6. World Health Organization. Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations, Geneva, Switzerland, retrieved on May 02, 2017 from [http://www.who.int/hiv/pub/guidelines/key\\_populations/](http://www.who.int/hiv/pub/guidelines/key_populations/)
7. National STD/AIDS Control Programme. Integrated biological and behavioural surveillance survey among key populations at higher risk of HIV in Sri Lanka (2014) – report, Ministry of Health, Colombo, Sri Lanka.
8. World Health Organization. Monitoring health for SDGs: Sustainable development goals, World health statistics 2016, retrieved 17, June 2018 from [www.who.int/gho/publications/world\\_health\\_statistics/2016/en/](http://www.who.int/gho/publications/world_health_statistics/2016/en/)
9. Ministry of health, nutrition & indigenous medicine. Programme for ending AIDS by 2025 in Sri Lanka, circular no 01 - 51/ 2016, Colombo, Sri Lanka.
10. National STD/ AIDS Control Programme. National HIV Strategic Plan Sri Lanka 2018 – 2022, Ministry of Health, Colombo, Sri Lanka.
11. World Health Organization. Statement on HIV testing services, Geneva, Switzerland, retrieved November 06, 2018, from <https://www.who.int/hiv/topics/vct/htsnew-opportunities/en>
12. Mburu G, Ngin C, Tuot S, Chhoun P, Pal K, Yi S. Patterns of HIV testing, drug use, and sexual behaviors in people who use drugs: findings from a 345 community-based outreach program in Phnom Penh, Cambodia, *Addiction science and clinical practice*, 2017, 2(27), doi: 10.1186/s13722-017-0094-
13. Shrestha R, Philip S, Shewade HD, Rawal B, Deuba K. Why don't key populations access HIV

testing and counselling centres in Nepal? Findings based on national surveillance survey. *BMJ Open*, 2017, 7: e017408. doi:10.1136/bmjopen-2017-017408

14. Rutledge R, Morozova O, Gibson BA, Altice FL, Kamarulzaman A, Wickersham JA. Correlates of Recent HIV Testing Among Transgender Women in Greater Kuala Lumpur, Malaysia, *LGBT Health*, 2018, 5 (8), doi: 10.1089/lgbt.2018.0021
15. Abramson JH, Abramson ZH. *Survey methods in community medicine* (5th ed.). Edinburgh, United Kingdom: Churchill Livingstone. 1999.