

## Research Article

# Characteristics of men who have sex with men and transgender women in Myanmar who test frequently for HIV

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### Background

HIV prevalence among men who have sex with men (MSM) and transgender women (TW) in Myanmar is increasing and less than half report having a HIV test in the past 12 months. The promotion of regular testing among this group has been identified as a key priority of the national HIV response, yet there remains limited information on HIV testing patterns and frequency among MSM and TW.

### Methods

A cross-sectional quantitative survey was conducted among self-identifying MSM and TW in November 2015 recruited from known hot-spot locations in Yangon and Mandalay to characterise the self-reported HIV testing frequencies among MSM and TW and explore factors associated with high frequency HIV testing.

### Results

Among 353 HIV negative or unknown MSM and TW, more than half were identified as high frequency testers based on their regular HIV testing routine and date of last HIV test; this was significantly associated with reporting recent sex with regular male partners and location of last HIV test.

### Conclusion

Our findings contrast with national data suggesting sub-optimal testing uptake and support HIV testing delivered through community-based, tailored HIV testing services and the role of such models in establishing and maintaining regular HIV testing behaviours among MSM and TW in Myanmar.

Men who have sex with men (MSM) and transgender women (TW) in Asia are more than 18 times more likely to acquire HIV compared to the general population.<sup>1</sup> Despite a general decline in HIV prevalence in the region, new and re-emerging epidemics have been observed among MSM and TW in some Asian countries, including the Philippines, Thailand and Myanmar.<sup>2-4</sup> In Myanmar, HIV prevalence among MSM and TW nationally is estimated at 11.6% with higher concentrations in the major urban areas of Yangon (27%) and Mandalay (22%).<sup>2</sup>

Regular HIV testing and timely diagnoses are important components of global HIV prevention and AIDS elimination strategies<sup>5</sup> and are prominent within the Myanmar HIV National Strategic Plan.<sup>2</sup> Early detection of HIV facilitates timely access to HIV treatment and viral suppression, reducing the probability of forward transmission,<sup>6</sup> and also affords opportunities for risk reduction practices.<sup>7</sup> Undiagnosed HIV is identified as a key driver of HIV transmission in many countries<sup>8,9</sup>; in the context of ongoing sexual risk behaviours among MSM and TW,<sup>10</sup> delayed diagnoses

of HIV are also likely to be a key factor in ongoing transmissions in Myanmar.

However, recent self-reported data indicates that less than half of all MSM and TW in Myanmar have tested for HIV in the past 12 months, while estimated coverage of HIV prevention programmes among MSM and TW is around 50%.<sup>2</sup> Access to HIV testing and prevention services is limited by considerable stigma and discrimination experienced by MSM and TW in Myanmar.<sup>11-13</sup> Sex between men remains criminalised, and alongside certain cultural and religious mores, this criminalisation contributes to an environment in which sexual minorities experience ongoing harassment and decreased access to HIV services.<sup>14,15</sup>

Regular and routine HIV testing among MSM and TW is crucial to meaningfully impact the HIV epidemic and has been identified as a key component of Myanmar's national response to HIV. While national guidelines for HIV testing are currently being developed in Myanmar, HIV testing services currently encourage a three-monthly HIV testing schedule for MSM and TW clients who report high-risk

behaviours.<sup>16</sup> Only one study in Myanmar to date has reported on recent HIV testing, finding that around one third of MSM and TW reported having an HIV test in the past three months.<sup>17</sup> There remains limited information on HIV testing patterns and frequency among MSM and TW in Myanmar to help inform local HIV strategies.

This study explores the self-reported histories of HIV testing among MSM and TW recruited through outreach activities in Yangon and Mandalay. To help inform strategies to enhance frequent HIV testing behaviours, we aimed to: 1) characterise the self-reported HIV testing frequency among MSM and TW; and 2) explore factors associated with MSM and TW reporting high frequency HIV testing.

## METHODS

The methods for this study have been described in detail elsewhere.<sup>18</sup> Briefly, a cross-sectional survey was administered among self-identifying MSM and TW in Yangon and Mandalay between November and December 2014. Participants were recruited by peer educators from the Myanmar Business Coalition on AIDS (MBCA), a non-governmental organisation (NGO) providing community-based HIV education and prevention services across Myanmar, who received training in research methodology. These peer researchers recruited MSM and TW using snowball and time-venue-based sampling in known MSM and TW 'hotspots'. Participants were provided with non-identifying study cards that provided information on when and where they could participate in surveys and up to three additional cards were given if participants indicated they knew peers who would be interested and eligible for participation. Eligibility criteria for survey participation included being biologically male, aged 18 and over, reporting anal sex with a male partner in the past 12 months, being willing and able to provide informed consent and no previous participation in the study.

## DATA COLLECTION

Surveys were peer-researcher administered in the local language using secure, electronic tablets. Surveys explored factors related to socio-demographic characteristics, sexual risk behaviours, HIV prevention practices, knowledge, attitudes and use of HIV/STI risk reduction strategies and self-perceived HIV risk among MSM and TW. Variables included in this analyses were: location of recruitment (Yangon, Mandalay), age, gender identity (male, TW), highest level of education (primary, middle, high school, tertiary), median monthly income in Myanmar Kyat (MMK), male sex partners during past three months (casual only, regular only, both casual and regular), location of last test (government hospital or clinic, private hospital or clinic, international/non-government organisation (i/NGO)), primary reason for undertaking last HIV test (concern/ interest in knowing status, part of regular testing pattern, suggestion from sexual partner or friend, symptoms of HIV, other) and self-perceived likelihood of future HIV acquisition (very unlikely, unlikely, neutral, likely, very likely). Barriers to HIV testing were assessed using Likert scales responses (strongly disagree, disagree, neutral, agree, strongly agree)

to statements about being worried about stigma when attending a HIV testing clinic, being afraid of disclosing HIV test results to others, not being able to afford HIV testing costs, not having the time to test for HIV, finding it generally difficult to access HIV testing services, and having to wait a long time to test for HIV. Proportions of participants reporting specific barriers to were determined by dichotomising level of agreement (strongly agree/agree versus neutral/disagree/strongly disagree).

## ANALYSIS

Our outcome of interest was high frequency testing behaviour, defined as reporting typically testing for HIV every three months and reporting receiving a HIV test within the past six months. We created a dichotomous (yes, no), composite variable to classify HIV undiagnosed MSM and TW as high frequency testers using the following variables: usual frequency of HIV testing (< 3 months, every 3-6 months, every 6-12 months, every 12-24 months, >24 months) and; time since last HIV test (past month, 1-6 months, 7-12 months, 1-2 years ago, >2 years/never).

Descriptive statistics were used to characterise high frequency testers across socio-demographics, sexual risk behaviours, and self-reported barriers to testing and perceived HIV risk. Analysis was restricted to participants who were HIV-negative or status unknown and who provided data on HIV status and the two testing variables used to make the composite outcome variable; Pearson's chi-square was used to assess any significant differences between HIV undiagnosed participants included and excluded in the analysis on the basis of missing data across socio-demographic variables. Univariable and multivariable logistic regression identified variables significantly associated with high frequency testing; variables significant in univariable analyses ( $P<0.1$ ) were retained in the multivariable model. Analyses were conducted using Stata (Version 13, Stata Corp., College Station, TX, USA). Statistical significance in multivariable model was set at  $P<0.05$ .

## ETHICS

Ethics approval was granted by the Department of Medical Research Ethics Review Committee, Myanmar and Alfred Hospital Human Research Ethics Committee, Melbourne, Australia (Project number 445/14).

## RESULTS

In total, 520 MSM and TW participants were recruited in Yangon ( $n=227$ ) and Mandalay ( $n=293$ ). Participants with a known HIV positive status ( $n=66$ ), or with missing data on HIV status ( $n=10$ ) or the two HIV testing variables used to classify high frequency testing behaviour ( $n=91$ ) were excluded from analyses. Participants whose data was excluded on the basis of missing data HIV testing variables were significantly more likely to be older, report lower income and educational attainment ( $P<0.05$ ) compared to included participants (data not shown).

Among the remaining 353 HIV-negative and undiagnosed participants, just over half were recruited from Man-

delay, were aged under 25 years and educated to tertiary or high school level. One in five participants identified as TW, while the rest identified as male gender. The median monthly income was 150,000 MMK (US\$ 109; interquartile range IQR 100,000–200,000 MMK).

Over one third of participants reported both regular and casual sex partners in the past three months, while 34% and 28% reported exclusively casual and regular sex partners, respectively. The most commonly reported barriers to HIV testing included not having enough time to test and fear of letting people know their HIV test results. Half of all participants considered it likely/very likely they would acquire HIV in the future.

The majority of participants identified *concern or interest to know HIV status* as a primary reason for last HIV test, while a quarter reported their last test as part of their regular testing practices. Most participants reported receiving their last HIV test at an NGO or iNGO service. Two thirds of participants reported typically testing for HIV approximately every three months and nearly 80% reported receiving an HIV test in the past six months (Table 1).

In total, 56% (n=197) of our sample were classified as high frequency testers on the basis of their typical testing frequency and time since their last test. In univariable analyses, high frequency testing was significantly associated with identifying as male compared to TW (OR=1.9; 95% CI=1.1–3.3), reporting sex with regular male partners only in the past three months compared to sex with casual partners (OR=2.3; 95% confidence interval CI=1.3–4.1) and receiving their last HIV test at an NGO/iNGO service compared to a government hospital or clinic (OR=3.9; 95% CI=1.4–11.2). At the multivariable level, after adjusting for age, reporting only regular sexual partners in the past three months (aOR=2.3; 95% CI=1.3–4.2), and receiving a last HIV test at an NGO/iNGO service (aOR=3.5; 95% CI=1.2–10.7) remained significantly associated with high frequency testing (Table 2).

## DISCUSSION

Nearly two thirds of MSM and TW were identified as high frequency testers based on their self-reported three-monthly testing routines and having had an HIV test in the past six months; this finding contrasts with the suboptimal rates of self-reported HIV testing among this group nationally.<sup>2</sup> High frequency testing was significantly associated with reporting only regular sex partners and location of last HIV test. Recent evidence demonstrating lower risk of HIV infection among frequent testers - a suspected association of risk reduction counselling provided at testing events - and the reduced risk of onward HIV transmission through the detection of acute HIV among Asian MSM<sup>19,20</sup> underscores the potential role of frequent HIV testing in controlling the HIV epidemic, beyond that simply associated with early HIV diagnosis. In light of previous reports of suboptimal HIV testing rates in Myanmar, and scant data on the patterns of HIV testing among MSM and TW, these findings of factors associated with frequent testing further local understandings of testing behaviours and can inform future HIV health promotion strategies and targeting of health promotion messages and testing services.

Our sample was recruited in the context of an existing community-based, non-governmental HIV prevention program that provided HIV prevention services, including testing referrals and health education on the importance of regular testing to MSM and TW. iNGO HIV prevention programmes in Myanmar routinely advise MSM and TW engaging in high-risk behaviour to undertake three-monthly HIV testing.<sup>16</sup> In this study, sixty percent of MSM and TW reported a typical three-monthly testing pattern and the majority reported testing within the past six months. While HIV testing frequencies among MSM at a country-level are still reported as inadequate,<sup>2</sup> testing patterns reported in our study are similar those reported by MSM and TW engaged with other non-governmental, peer-involved, community-based programmes in Myanmar.<sup>16</sup> Together, these findings suggest a high degree of responsiveness among MSM and TW to HIV testing health promotion messages provided by community organisations. This view is further supported by our finding that MSM and TW who reported receiving their most recent test at an iNGO service were nearly four times more likely to be classified as high frequency testers compared to those who tested at a government service.

Myanmar has seen a rapid expansion of iNGO-provided HIV testing and prevention services over the last decade, driven by increases in donor funding and occurring alongside the decentralisation of HIV testing services.<sup>21</sup> These services are typically tailored to the specific needs of priority populations and increasingly utilise peers in key service delivery roles, reflecting global guidance and normative practice around HIV service provision for key populations.<sup>22,23</sup> Our findings speak to the importance of MSM and TW-friendly services, particularly in a country where homosexual behaviour remains criminalised and sexual minorities face ongoing harassment and discrimination.<sup>15,24</sup> Widely regarded in Myanmar as safe environments where sexual minorities can speak freely about same-sex behaviours,<sup>15</sup> iNGO HIV services that include peers in key service-delivery roles offer an important foundation for HIV prevention services and counselling that are appropriately aligned with actual risk behaviours.

The association between high frequency testing and location of last test may also reflect MSM and TW's perceptions or past experiences of HIV testing within government services. Studies suggest that these services are seen as discriminatory towards sexual minorities and are typically avoided by MSM and TW in Myanmar due to fear of stigma and discrimination from staff.<sup>15,16</sup> It is somewhat concerning that the new National Strategic Plan in Myanmar supports the transfer of HIV treatment services from iNGO providers back to the public sector.<sup>2</sup> Despite the disproportionate representation of MSM and TW among PLHIV in Myanmar, a recent review of patients enrolled in HIV treatment at two large public hospitals in Yangon found that less than 1% reported male-to-male sexual contact as a risk factor for infection.<sup>25</sup> This figure indicates either an underreporting of sexual risk behaviours or the limited utilisation of these centres by MSM and TW. As HIV policy in Myanmar continues to emphasise a "test and treat" prevention and care strategies, the benefits accrued from frequent HIV testing may be undermined if HIV treatment services are not

**Table 1. Socio-demographic characteristics, sexual behaviour and HIV testing patterns among MSM and TW in Myanmar (n=353)**

Variable	n (%)
<b>Location:</b>	
Yangon	151 (42.8)
Mandalay	202 (57.2)
<b>Age:</b>	
Median (IQR)	23 years (20-28 years)
<25	197 (56.0)
25-29	93 (26.4)
30>	62 (17.6)
<b>Self-reported gender:</b>	
Male	284 (80.7)
TW	68 (19.3)
<b>Highest level of education achieved:</b>	
Tertiary level	110 (31.3)
High school	133 (37.8)
Middle school	86 (24.4)
Primary school or below	23 (6.5)
<b>Monthly income:</b>	
Median monthly amount in MMK (IQR)	150,000 (100,000-200,000)
Above median (>150,000 MMK)	125 (35.7)
Below median (<150,000 MMK)	225 (63.7)
<b>Sexual partners in past three months:</b>	
Both regular and casual partners	127 (37.6)
Regular partner(s) only	96 (28.4)
Casual partner(s) only	115 (34.0)
<b>Self-reported likelihood of acquiring HIV in the future:</b>	
Likely/very likely	170 (50.2)
Very unlikely/Unlikely/Neutral	169 (49.9)
<b>Perceived barriers to HIV testing:</b>	
<i>I worry about stigma if seen attending a HIV testing clinic</i>	
Agree	78 (23.8)
Disagree	250 (76.2)
<i>I am afraid of letting people know my HIV test result</i>	
Agree	120 (36.5)
Disagree	209 (63.5)
<i>I cannot afford the costs associated with HIV testing</i>	
Agree	87 (26.5)
Disagree	241 (73.5)
<i>I don't have time to test for HIV</i>	
Agree	158 (48.0)
Disagree	171 (52.0)
<i>I find it difficult to access services HIV testing service</i>	
Agree	116 (35.3)
Disagree	213 (64.7)
<i>I have to wait a long time to test for HIV</i>	
Agree	88 (26.8)
Disagree	241 (73.2)
<b>HIV testing behaviours:</b>	

Variable	n (%)
<b>Reason for undertaking last HIV test*</b>	
Concern/ interest to know status	321 (90.3)
Part of regular testing pattern	94 (26.3)
Suggestion from sexual partner or friend	63 (17.8)
Symptoms of HIV	11 (3.1)
Other	26 (7.9)
<b>Location of last HIV test:</b>	
NGO/iNGO	312 (88.4)
Government hospital or clinic	18 (5.1)
Private hospital or clinic	16 (4.5)
<b>How often do you typically attend for an HIV test?</b>	
At least every three months	213 (60.3)
At least every six months	76 (21.5)
Every 6-12 months	18 (5.1)
Every 1-2 years	27 (6.5)
More than 24 months since my last test	19 (5.4)
<b>Time since last HIV test:</b>	
In the past six months	279 (79.7)
Six months-2 years	52 (14.9)
Over 2 years/ never tested	19 (5.4)
<b>High frequency testing status:</b>	
Yes	197 (55.8)
No	156 (44.2)

IQR – interquartile range, MSM – men who have sex with men, TW – transgender women, MMK – Myanmar Kyat, NGO – non-governmental organization, i/NGO – international non-governmental organization

\*Proportions do not equal 100% as multiple answers permitted.

perceived as friendly, safe and supportive services by those at highest risk of HIV infection.

In this study, participants reporting only regular partners were more likely to be high frequency testers compared to those with only casual partners. Recent evidence suggests that MSM and TW in Myanmar are engaging in seroadaptive behaviours,<sup>26</sup> and our finding could illustrate the emergence of negotiated safety as a risk reduction strategy. In our sample condomless sex with regular partners was more commonly reported than with casual partners<sup>18</sup> and in light of the result presented in this paper, condomless sex within a regular partner may have been predicated on regular HIV testing. However, there is a limited understanding about how different sexual partnerships and assessments of risk may motivate testing behaviours among MSM and TW in Myanmar or regionally. Apart from one study which found that a sense of responsibility towards regular sexual partners was associated with regular testing among Chinese MSM,<sup>27</sup> much of the available research on facilitators of regular testing comes from high-income settings and largely suggests HIV testing which is motivated by engagement in risk behaviours, such as multiple casual partnerships or engaging in condomless sex.<sup>28,29</sup> The discrepancy in testing motivations among MSM in these high-income settings with the findings of this study reinforce the importance of context-specific understanding of risk assessment among MSM and TW when shaping health promotion

messages and priorities. How different sexual partnerships interact with MSM and TW's health seeking behaviours in Myanmar warrants further exploration.

Our findings should be considered with the following limitations. MSM and TW in study were recruited by peer-researchers in an outreach environment reached by a community-based HIV prevention service that provided health promotion on the importance of HIV testing and referrals to testing services. Additionally, our sample was recruited from the two largest urban areas in Myanmar with greater access to HIV prevention programmes and were also relatively well educated and remunerated<sup>30</sup> and their testing behaviours may not reflect MSM and TW who are economically and socially-disadvantaged or reside outside of urban areas; this is further supported by the significant differences noted among included and excluded participants who were less educated, less well-remunerated and older in age compared to included participants.

We demonstrated a rate of HIV testing that was substantially higher than the national average and findings may not reflect the broader MSM community and those residing in more isolated areas with less access to HIV services. Our description of high frequency testing behaviour relies on self-reported measures and we acknowledge the possible contribution of responder-bias, particularly given the involvement of peer outreach workers as data collectors. There is no reliable objective data on HIV testing frequen-

**Table 2. Associations with high frequency testing status (n=197)**

	High frequency testers n (%)	Factors associated with high frequency testing	
		OR (95% CI)	aOR (95% CI)
<b>Location</b>			
Yangon	89 (58.9)	1.2 (0.8-1.9)	
Mandalay	108 (53.5)	1	
<b>Age:</b>			
Median (IQR)	23 years (20-28 years)		
<25	116 (58.9)	1.1 (0.6-2.0)	1.1 (0.6-2.2)
25-29	46 (49.5)	0.8 (0.4-1.4)	0.8 (0.4-1.7)
30>	35 (56.5)	1	1
<b>Self-reported gender:</b>			
TW	46 (67.7)	1.9 (1.1-3.3)*	1.8 (1.0-3.3)
Male	150 (52.8)	1	1
<b>Highest level of education achieved:</b>			
Tertiary level	63 (57.3)	1.0 (0.4-2.6)	
High school	77 (57.9)	1.1 (0.4-2.6)	
Middle school	44 (51.2)	0.8 (0.3-2.0)	
Primary school or below	13 (56.5)	1	
<b>Monthly income</b>			
Median monthly amount in MMK (IQR)	150,000 (100,000-200,000)		
Above median (>150,000 MMK)	77 (61.6)	1.4 (0.9-2.2)	
Below median (<150,000 MMK)	119 (52.9)	1	
<b>Sexual partners in past three months</b>			
Both regular and casual partners	70 (55.1)	1.4 (0.7-2.4)	1.4 (0.8-2.5)
Regular partner(s) only	64 (66.7)	2.3 (1.3-4.1)**	2.3 (1.3-4.2)**
Casual partner(s) only	53 (49.1)	1	1
<b>Location of last HIV test:</b>			
NGO/iNGO service	187 (59.9)	3.9 (1.4-11.2)*	3.5 (1.2-10.7)*
Private hospital or clinic	5 (31.3)	1.2 (0.3-5.1)	1.1 (0.2-5.3)
Government hospital/ clinic	5 (27.8)	1	1
<b>Self-reported likelihood of acquiring HIV in the future:</b>			
Likely/ very likely	96 (56.5)	1.1 (0.7-1.6)	
Very unlikely/ Unlikely/ Neutral	93 (55.0)	1	
<b>Perceived barriers to HIV testing:</b>			
<i>I worry about stigma if seen attending a HIV testing clinic</i>			
Agree	44 (56.4)	1.0 (0.6-1.7)	
Disagree	140 (56.0)	1	
<i>I am afraid of letting people know my HIV test result</i>			
Agree	70 (58.3)	1.2 (0.7-1.8)	
Disagree	114 (54.6)	1	
<i>I cannot afford the costs associated with HIV testing</i>			
Agree	47 (54.0)	0.9 (0.5-1.5)	
Disagree	137 (56.9)	1	
<i>I don't have time to test for HIV</i>			
Agree	90 (60.0)	1.1 (0.7-1.7)	
Disagree	94 (55.0)	1	
<i>I have to wait a long time to test for HIV</i>			
Agree	52 (59.1)	1.2 (0.7-2.0)	
Disagree	132 (54.8)	1	

CI – confidence interval, aOR – adjusted odds ratio, IQR – interquartile range, MSM – men who have sex with men, TW – transgender women, MMK – Myanmar Kyat, NGO – non-governmental organization, i/NGO – international non-governmental organization

\* $P < 0.05$ , \*\* $P < 0.01$ .

cies among MSM and TW in Myanmar. Our use of the composite variable, comprising usual testing routine and time

since last HIV test, was designed to help strengthen the validity of this outcome.

This study found evidence of high rates of HIV testing uptake and frequency among MSM and TW in Myanmar, despite low HIV testing rates reported nationally. High frequency testing behaviours were associated with receiving a last test at an i/NGO service and reporting only regular sexual partners. Our findings underscore the utility of community-based i/NGO services in establishing and maintaining regular engagement of MSM and TW in HIV prevention and support the expansion of health promotion messaging and strategies beyond the engagement of naïve MSM and TW testers, to the establishment and maintenance of routine HIV testing.

## CONCLUSION

This study found evidence of high rates of HIV testing uptake and frequency among MSM and TW in Myanmar, despite low HIV testing rates reported nationally. High frequency testing behaviours were associated with receiving a last test at an i/NGO service and reporting only regular sexual partners. Our findings underscore the utility of community-based i/NGO services in establishing and maintaining regular engagement of MSM and TW in HIV prevention and support the expansion of health promotion messaging and strategies beyond the engagement of naïve MSM and TW testers, to the establishment and maintenance of routine HIV testing.

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## COMPETING INTERESTS

The authors have completed the Unified Competing Interest form at [http://www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare no conflict of interest.

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