Published in final edited form as:

Sex Transm Dis. 2017 July ; 44(7): 406–411. doi:10.1097/OLQ.0000000000000624.

Playing and never testing: HIV and STI testing among app-using MSM in Southeast Asia

Kevin Weiss, MPH,

Data Analyst, Department of Epidemiology, Rollins School of Public Health, Emory University

Kai J. Jonas, PhD, and

Associate Professor, Faculty of Psychology and Neuroscience, Maastricht University and,
Department of Psychology, University of Amsterdam

Thomas E. Guadamuz, PhD, MHS

Assistant Professor of Medical Social Sciences and Public Health, Department of Society and Health and the Center for Health Policy Studies, Faculty of Social Sciences and Humanities, Mahidol University

Abstract

Little is known about mobile application (app)-based behavior of MSM in Thailand. A cross-sectional online assessment of apps using MSM in Bangkok found that more than a quarter have never tested for HIV and one in three never tested for STI. STI testing patterns and HIV testing frequency were highly associated with each other in multinomial logistic regression. In a midst of an escalating epidemic where HIV incidence among MSM is highest in Asia, apps can serve to engage those least likely to be reached by traditional methods of recruitment and outreach in Thailand.

Keywords

HIV testing; STI testing; MSM; Southeast Asia; Internet

Introduction

In Thailand and globally, human immunodeficiency virus (HIV) and sexually transmitted infection (STI) incidence in men who have sex with men (MSM) has been sustained at high levels.^{1–5} Thai MSM commonly have multiple recent sexual partners, but testing rates and utilization of HIV and STI voluntary counseling and testing (VCT) services remain suboptimal, with 21% and 43%, respectively, of Thai MSM reporting having never tested for HIV and inconsistent condom usage in a recent online survey of Southeast Asian MSM.^{6,7}

Increasingly, the Internet and geo-social networking applications (apps) on mobile phones are popular places for seeking sexual partners for MSM, with estimated usage ranging as high as 60–75%.^{8–12} Research on Internet social networking sites and apps has focused on

sexual risk behaviors and usage patterns, though findings about risk-taking, STI diagnoses, and sexual practices associated with online partner seeking have been mixed.^{11,13–15} Apps have proved useful in recruiting for epidemiologic studies, providing rich data on STIs and testing patterns through surveys, and tools for prevention interventions in high-income countries.^{8,12,13,16–18}

Paramount, usage, characteristics of app users, and their testing patterns for HIV and STIs have not been well described in Southeast Asia. Thai and Southeast Asian MSM are spending time online, yet prevention efforts have not utilized the online space.⁶ Given the essential nature of testing to prevention work and the HIV care continuum, the need for increasing testing rates among MSM has never been more important.^{6,19} Apps could play an important role in engaging MSM in prevention as well as describing testing and sexual behaviors.

Using data from an app-based survey, this study aims to describe reported HIV and STI testing patterns of Bangkok MSM app users, and highlight characteristics associated with never testing. Adapting prevention to apps that engage MSM can serve as a model for linking them to HIV and STI testing, fundamental to combating increasing epidemics in Southeast Asia.²⁰

Methods

Survey and responses

App-using MSM were recruited to an uncompensated survey through clicking on a push message placed on an app popular in Southeast Asia on three weekends in November 2014. Consenting participants reported cross-sectional data on demographic characteristics, sexual behaviors, reported illnesses and infections, and STI and HIV testing. Data was gathered via www.qualtrics.com and analysis was performed with SAS (Cary, N.C, version 9.4). The ethics review boards of Mahidol University and the University of Amsterdam approved this study.

Participants were asked about age and country of origin, and a seven-point Likert scale was used for questions regarding anal intercourse roles, compensation for sex, and condom use during anal intercourse. For this analysis, 6 or 7 on a 1 to 7 scale from “bottom” to “top” was defined as mostly top position for anal intercourse, mostly bottom defined as 1 or 2, and all other values as “both.” Always using condoms was defined as 7 on a 1 to 7 scale from “never” to “always,” with all other choices classified as inconsistent.

A series of questions regarding partner trust and exchange of money, drugs, or alcohol for sex were asked using a five-point Likert scale ranging from “not at all like me” to “just like me.” Responses other than “not at all like me” were classified as having ever engaged in the behavior. Participants reported patterns of HIV and STI testing, and reported illnesses in the previous six months. Of 720 individuals who began the survey, 415 (57.6%) completed the questions. The final eligible population comprised the 356 Thai individuals who completed the questions.

Statistical analysis

Participant characteristics were described using frequencies for categorical variables and means and standard deviations for continuous variables. Participants reporting HIV testing within 6 or 12 months were combined into a recent HIV testing group; participants reporting testing more than one year prior were also combined into a not recently testing for HIV category. Additionally, an irregular STI testing category captured participants testing outside an interval-based schedule, including symptomatic or more than one-year prior. Participants reporting STI testing on an interval (every 3, 6, or 12 months) were classified as regular testers, and others were classified as never testing for STIs.

Chi-square tests for categorical variables were used to determine differences in demographic characteristics by testing pattern. Unadjusted bivariate associations between factors and testing patterns are reported as unadjusted prevalence odds ratios (ORs) with associated 95% confidence intervals (CI). All covariates significant at $\alpha=0.10$ were entered into multinomial multivariable logistic regression models comparing three testing patterns (never, irregular, and regular). Final models included only covariates significant at $\alpha=0.05$ via backwards elimination after collinearity assessment. Remaining covariates were considered for all possible two-way interactions. Multivariable findings are reported as adjusted odds ratios (aORs) with associated 95% CIs.

Results

Of 356 eligible Thai MSM, 150 (42.1%) and 130 (36.5%), respectively, had tested for HIV and other STIs in the last year, while nearly a third (28.9% and 32.9%, respectively) had never tested for HIV or other STIs (Table 1). Half (51.6%) of eligible respondents were between 25–34 years old. Of participants, 186 out of 329 (56.5%) completed the survey in Bangkok, and nearly all reported having sexual intercourse with mostly men. Self-reported prevalence of recent STIs was 19.9% and only half (51.4%) reported always using condoms during anal sex. In bivariate analysis, age, usual anal sex position, last HIV test, reporting a STI in the last 6 months, and reported HIV status were significantly associated with STI testing pattern. Last HIV test was significantly associated with age, location of survey completion, STI testing frequency, reporting a STI in the last 6 months, reported HIV status, condom use during anal sex, and sexual transactions.

In multivariable analysis, only HIV testing pattern was significantly associated with low STI testing frequency for comparisons of never testers to both regular (aOR for HIV test >1 year prior = 0.03, aOR for HIV test in prior year: <0.01) and irregular STI testers (aOR for HIV test >1 year prior = 0.02, aOR for HIV test in prior year: 0.04). HIV testing frequency was the only significant association with never testing for STIs in multivariable analysis for comparisons of never testers to both recent (aOR for regular STI testing = 0.05, aOR for irregular STI testing: <0.01) and non-recent HIV testers (aOR for regular STI testing = 0.02, aOR for irregular STI testing: 0.03).

Discussion

As the Thai HIV epidemic continues to escalate, characterizing testing behaviors of key populations is vital for interventions. Few studies have focused on describing HIV and STI testing patterns in MSM or describing prevalence and correlates of never testing for HIV and STIs. To our knowledge, this study furthers previous work as one of the first to describe any characteristics of app users in Thailand. It also demonstrates the ability of apps to collect meaningful data on sexual and testing behaviors in MSM.

Findings of high prevalence of inconsistent condom use and never testing for HIV and STI are consistent with previous studies of MSM in Asia and elsewhere.^{16,20,21} Never testing is most prevalent in younger age groups, with two-thirds of MSM 15–19 years and almost half of 20–24 years having never tested. As app usage has been associated with HIV and STI sexual risk behaviors, observing that inconsistent condom use was highest in irregular or never testers may amplify concerns regarding low awareness of HIV serostatus and the importance of testing.

Recent STI testing was less frequent than corresponding HIV testing in this study, but STI and HIV testing frequency were highly associated with each other in multivariable analyses. In Thailand, VCT has increased odds of consistent condom use, reduced transmission risk, and heightened acceptability of PrEP.^{22,23} In the backdrop of risky sexual activities and scarce serostatus awareness, targeted interventions are urgently needed to link young Thai MSM to VCT, and if positive, timely linkage and care engagement.

We chose to categorize symptomatic testing as irregular in reference to the possibility that regular and irregular testing categories can serve as proxies for interval-based and risk-based testing patterns. These two categories have been at the center of the debate over the most effective method to recommend testing to MSM.²⁴ This study highlights the existence of Thai app-using MSM who follow both interval-based and risk-based patterns. Future national testing recommendations for Thai MSM might be served in reflecting this heterogeneity in testing behaviors.

There are limitations in this study. As a cross-sectional online survey, temporality of associations and self-reporting are of concern. Individuals may under-report never HIV or STI testing due to social desirability bias, but that could make our findings more robust. Another concern is that these findings are only generalizable to smartphone-accessing Thai MSM.²⁵ However, several studies have confirmed that the Internet is where young people in Asia spend their time, seeking social and sexual relationships.^{6,26} The Thai term for using the Internet, for example, is *len net*, which literally means “playing the Net.” The Internet is thus seen as a ‘play space’ where fantasies and pleasures are experienced and where health, well-being and, in this case, HIV and STI testing, currently do not have a space.²⁷

Acceptance of app-based prevention has been high in MSM, including those with low testing self-efficacy.^{8,25,28,29} Individuals who seek sexual partners via online means have been more likely to have been diagnosed with STIs, have more partners, and have frequent anal intercourse.^{8–13,30} This study highlights a highly sexually active group that may not be accessing traditional HIV/STI testing centers. There is a lack of awareness in app-using

MSM in Thailand, and study participants are robust non-testers for HIV and STIs. Mobile applications can serve to engage those least likely to be reached by traditional methods of recruitment and outreach in Thailand. As apps continue to engage MSM, future interventions should explore how apps can engage individuals in testing, prevention, and education.

Acknowledgments

Authors must obtain written permission from all individuals who are listed in the Acknowledgments section of the manuscript, because readers may infer their endorsement of data and conclusions. The corresponding author must sign the Acknowledgment form and submit online with the manuscript. The corresponding author must sign the following statement, certifying that (1) all persons who have made substantial contributions in the manuscript (eg. Data collection, analysis, or writing or editing assistance), but who do not fulfill authorship criteria, are named in the Acknowledgements section of the manuscript; (2) all persons named in the Acknowledgments section have provided the corresponding author with written permission to be named in the manuscript; and (3) if an Acknowledgments section is not included, no other persons have made substantial contributions to this manuscript.

References

1. Sullivan PS, Beyrer C, van Griensven F, et al. HIV in Thai men who have sex with men: a sustained emergency. *Lancet HIV*. 2015; 2(2):e38–e39. [PubMed: 26424458]
2. Beyrer C, Baral SD, van Griensven F, et al. Global epidemiology of HIV infection in men who have sex with men. *Lancet* (London, England). 2012; 380(9839):367–377.
3. Sirivongrangson P, Lolekha R, Charoenwatanachokchai A, et al. HIV risk behavior among HIV-infected men who have sex with men in Bangkok, Thailand. *AIDS Behav*. 2012; 16(3):618–625. [PubMed: 21274611]
4. van Griensven F, Holtz TH, Thienkrua W, et al. Temporal trends in HIV-1 incidence and risk behaviours in men who have sex with men in Bangkok, Thailand, 2006–13: an observational study. *Lancet HIV*. 2015; 2(2):e64–e70. [PubMed: 26424462]
5. Tongtoyai J, Todd CS, Chonwattana W, et al. Prevalence and Correlates of Chlamydia trachomatis and Neisseria gonorrhoeae by Anatomic Site Among Urban Thai Men Who Have Sex With Men. *Sex Transm Dis*. 2015; 42(8):440–449. [PubMed: 26165436]
6. Guadamuz, TE., Cheung, DH., Wei, C., et al. Young, Online and in the Dark: Scaling Up HIV Testing among MSM in ASEAN. In: Newman, PA., editor. *PLoS One*. Vol. 10. 2015. p. e0126658
7. Wimonasate W, Naorat S, Varangrat A, et al. Factors associated with HIV testing history and returning for HIV test results among men who have sex with men in Thailand. *AIDS Behav*. 2011; 15(4):693–701. [PubMed: 20623251]
8. Landovitz RJ, Tseng C-H, Weissman M, et al. Epidemiology, sexual risk behavior, and HIV prevention practices of men who have sex with men using GRINDR in Los Angeles, California. *J Urban Health*. 2013; 90(4):729–739. [PubMed: 22983721]
9. Wei C, Lim SH, Guadamuz TE, Koe S. Virtual versus physical spaces: which facilitates greater HIV risk taking among men who have sex with men in East and South-East Asia? *AIDS Behav*. 2014; 18(8):1428–1435. [PubMed: 24077974]
10. Bauermeister JA, Leslie-Santana M, Johns MM, Pingel E, Eisenberg A. Mr. Right and Mr. Right Now: romantic and casual partner-seeking online among young men who have sex with men. *AIDS Behav*. 2011; 15(2):261–272. [PubMed: 20953689]
11. Horvath KJ, Rosser BRS, Remafedi G. Sexual risk taking among young internet-using men who have sex with men. *Am J Public Health*. 2008; 98(6):1059–1067. [PubMed: 18445804]
12. Phillips G, Magnus M, Kuo I, et al. Use of geosocial networking (GSN) mobile phone applications to find men for sex by men who have sex with men (MSM) in Washington, DC. *AIDS Behav*. 2014; 18(9):1630–1637. [PubMed: 24682866]
13. Goedel WC, Duncan DT. Geosocial-Networking App Usage Patterns of Gay, Bisexual, and Other Men Who Have Sex With Men: Survey Among Users of Grindr, A Mobile Dating App. *JMIR Public Heal Surveill*. 2015; 1(1):e4.

14. Rice E, Holloway I, Winetrobe H, et al. Sex Risk among Young Men who have Sex with Men who use Grindr, a Smartphone Geosocial Networking Application. *J AIDS Clin Res.* 2012; 01(S4)
15. Rosser BRS, Oakes JM, Horvath KJ, Konstan JA, Danilenko GP, Peterson JL. HIV sexual risk behavior by men who use the Internet to seek sex with men: results of the Men's INternet Sex Study-II (MINTS-II). *AIDS Behav.* 2009; 13(3):488–498. [PubMed: 19205866]
16. Rendina HJ, Jimenez RH, Grov C, Ventuneac A, Parsons JT. Patterns of lifetime and recent HIV testing among men who have sex with men in New York City who use Grindr. *AIDS Behav.* 2014; 18(1):41–49. [PubMed: 23925515]
17. Su J-Y, Holt J, Payne R, Gates K, Ewing A, Ryder N. Effectiveness of using Grindr to increase syphilis testing among men who have sex with men in Darwin, Australia. *Aust N Z J Public Health.* 2015; 39(3):293–294. [PubMed: 25716209]
18. Sanchez TH, Sineath RC, Kahle EM, Tregear SJ, Sullivan PS. The Annual American Men's Internet Survey of Behaviors of Men Who Have Sex With Men in the United States: Protocol and Key Indicators Report 2013. *JMIR Public Heal Surveill.* 2015; 1(1):e3.
19. Sullivan PS, Carballo-Diéguez A, Coates T, et al. Successes and challenges of HIV prevention in men who have sex with men. *Lancet (London, England).* 2012; 380(9839):388–399.
20. Anand T, Nitpolprasert C, Ananworanich J, et al. Innovative strategies using communications technologies to engage gay men and other men who have sex with men into early HIV testing and treatment in Thailand. *J virus Erad.* 2015; 1(2):111–115. [PubMed: 27482400]
21. van Griensven F, Thienkrua W, McNicholl J, et al. Evidence of an explosive epidemic of HIV infection in a cohort of men who have sex with men in Thailand. *AIDS.* 2013; 27(5):825–832. [PubMed: 23169330]
22. Yang, D., Chariyalertsak, C., Wongthanee, A., et al. Acceptability of Pre-Exposure Prophylaxis among Men Who Have Sex with Men and Transgender Women in Northern Thailand. In: Graham, SM., editor. *PLoS One.* Vol. 8. 2013. p. e76650
23. Yuntadilok N, Timmuang R, Timsard S, et al. Eroding gains in safe sex behavior, HIV/AIDS knowledge, and risk perceptions among royal Thai Navy conscripts after 28 years of the AIDS epidemic in Thailand. *AIDS Behav.* 2014; 18(Suppl 1):S42–S49. [PubMed: 23700222]
24. Khanna A, Goodreau SM, Wohlfeiler D, Daar E, Little S, Gorbach PM. Individualized diagnosis interventions can add significant effectiveness in reducing human immunodeficiency virus incidence among men who have sex with men: insights from Southern California. *Ann Epidemiol.* 2015; 25(1):1–6. [PubMed: 25453725]
25. Holloway IW, Rice E, Gibbs J, Winetrobe H, Dunlap S, Rhoades H. Acceptability of smartphone application-based HIV prevention among young men who have sex with men. *AIDS Behav.* 2014; 18(2):285–296. [PubMed: 24292281]
26. Boonmongkon P, Ojanen TT, Samakkeekarom R, et al. "She met her (boy)friend online": Negotiating gender identity and sexuality among young Thai women in online space. *Cult Health Sex.* 2013; 15(10):1162–1174. [PubMed: 23885969]
27. Samakkeekarom, R., Boonmongkon, P. Cyberspace, power structures, and gay sexual health: The sexuality of Thai men who have sex with men (MSM) in the Camfrog on-line web-cam chat rooms. In: Jackson, P., editor. *Queer Bangkok: 21st Century Markets, Media and Rights.* Vol. 1. Hong Kong: Hong Kong University Press; 2011. p. 121-140.
28. Justumus, P., Colby, D., Mai Doan Anh, T., et al. Willingness to Use the Internet to Seek Information on HIV Prevention and Care among Men Who Have Sex with Men in Ho Chi Minh City, Vietnam. In: Sullivan, PS., editor. *PLoS One.* Vol. 8. 2013. p. e71471
29. Sun CJ, Stowers J, Miller C, Bachmann LH, Rhodes SD. Acceptability and feasibility of using established geosocial and sexual networking mobile applications to promote HIV and STD testing among men who have sex with men. *AIDS Behav.* 2015; 19(3):543–552. [PubMed: 25381563]
30. Holloway IW, Pulsipher CA, Gibbs J, Barman-Adhikari A, Rice E. Network Influences on the Sexual Risk Behaviors of Gay, Bisexual and Other Men Who Have Sex with Men Using Geosocial Networking Applications. *AIDS Behav.* 2015; 19(Suppl 2):112–122. [PubMed: 25572832]

Summary

This study aims to describe app users in Bangkok, their reported HIV and STI testing patterns, and demographic and behavioral characteristics associated with never testing.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1
Socio-demographic and behavioral factors of 356 app-accessing Thai men, by HIV and STI testing patterns

	Reported STI Testing Pattern				Last HIV test			
	Total (n=356)	Regular STI Testers (n=130)	Irregular STI testers (n=109)	Never tested for STIs (n=117)	p-value	In the last year (n=150)	More than one year ago (n=103)	Never tested for HIV (n=103)
	N (%)	N (%)	N (%)	N (%)		N (%)	N (%)	N (%)
<i>Age category^a</i>					< 0.01			< 0.01
15–19 years old	15 (4.4)	3 (20.0)	1 (6.7)	11 (73.3)		3 (20.0)	1 (6.7)	11 (73.3)
20–24 years old	60 (17.4)	20 (33.3)	10 (16.7)	30 (50.0)		23 (38.3)	10 (16.7)	27 (45.0)
25–29 years old	88 (25.5)	36 (40.9)	23 (26.1)	29 (33.0)		39 (44.3)	23 (26.1)	2 (29.6)
30–34 years old	90 (26.1)	30 (33.3)	35 (38.9)	25 (27.8)		37 (41.1)	34 (37.8)	19 (21.1)
35–39 years old	47 (13.6)	17 (36.2)	19 (40.4)	11 (23.4)		26 (55.3)	13 (27.7)	8 (17.0)
40+ years old	45 (13.0)	18 (40.0)	17 (37.8)	10 (22.2)		16 (35.6)	19 (42.2)	10 (22.2)
<i>Location of survey completion^b</i>					0.11			0.05
Bangkok	186 (56.5)	72 (38.7)	60 (32.3)	54 (29.0)		89 (47.9)	52 (28.0)	45 (24.2)
Outside Bangkok	143 (43.5)	49 (34.3)	37 (25.9)	57 (39.9)		51 (35.7)	42 (29.4)	50 (35.0)
<i>Usual sex of sexual partner</i>					0.80			0.50
Mostly Male	331 (93.0)	121 (36.6)	100 (30.2)	110 (33.2)		137 (41.4)	96 (29.0)	98 (29.6)
Other	25 (7.0)	9 (36.0)	9 (36.0)	7 (28.0)		13 (52.0)	7 (28.0)	5 (20.0)
<i>Usual anal sex position</i>					0.08			0.25
Mostly Bottom	120 (33.7)	55 (38.5)	32 (22.4)	56 (39.2)		59 (41.3)	34 (23.8)	50 (35.0)
Mostly Top	143 (40.2)	42 (35.0)	44 (36.7)	34 (28.3)		50 (41.7)	40 (33.3)	30 (25.0)
Both	93 (26.1)	33 (35.5)	33 (35.5)	27 (29.0)		41 (44.1)	29 (31.2)	23 (24.7)
<i>Returned for HIV result^c</i>	236 (94.4)	122 (51.7)	90 (38.1)	24 (10.2)	0.24	143 (60.6)	93 (39.4)	—
<i>Frequency of STI testing</i>					< 0.01			< 0.01

	Reported STI Testing Pattern					Last HIV test			
	Total (n=356)	Regular STI Testers (n=130)	Irregular STI testers (n=109)	Never tested for STIs (n=117)	p-value	In the last year (n=150)	More than one year ago (n=103)	Never tested for HIV (n=103)	p-value
	N (%)	N (%)	N (%)	N (%)		N (%)	N (%)	N (%)	
Never been tested	117 (32.9)	—	—	—		10 (8.6)	16 (13.7)	91 (77.8)	
Irregular/symptomatic	109 (30.6)	—	—	—		23 (21.1)	76 (69.7)	10 (9.2)	
Regular interval (At least once per year)	130 (36.5)	—	—	—		117 (90.0)	11 (8.5)	2 (1.5)	
<i>Last HIV Test</i>									
Never been tested	103 (28.9)	117 (78.0)	23 (15.3)	10 (6.7)		—	—	—	
More than one year ago	103 (28.9)	11 (10.7)	76 (73.8)	16 (15.5)		—	—	—	
In the past year	150 (42.1)	2 (1.9)	10 (9.7)	91 (88.4)		—	—	—	
<i>Illnesses in prior 6 months^e</i>									
Any STI	71 (19.9)	32 (45.1)	22 (31.0)	17 (23.9)	0.02	38 (53.5)	18 (25.4)	15 (21.1)	0.08
<i>Reported HIV status</i>									
					< 0.01				< 0.01
Positive	10 (2.8)	7 (70.0)	3 (30.0)	0 (0.0)		8 (80.0)	2 (20.0)	0 (0.0)	
Negative	202 (56.7)	102 (50.5)	58 (28.7)	42 (20.8)		113 (55.9)	59 (29.2)	30 (14.9)	
Don't know/Don't want to say	144 (40.5)	21 (14.6)	48 (33.3)	75 (52.1)		29 (20.1)	42 (29.2)	73 (50.7)	
<i>Condom use during anal sex</i>									
					0.20				0.07
Inconsistent or never	173 (48.6)	55 (31.8)	57 (33.0)	61 (35.3)		64 (37.0)	50 (28.9)	59 (34.1)	
Always consistent	183 (51.4)	75 (41.0)	52 (28.4)	56 (30.6)		86 (47.0)	53 (29.0)	44 (24.0)	
<i>Sexual transactions</i>									
					0.34				0.05
None	185 (52.0)	70 (37.8)	49 (26.5)	66 (35.7)		80 (43.2)	49 (26.5)	56 (30.3)	
Only paid money or drugs	38 (10.7)	13 (34.2)	10 (26.3)	15 (39.5)		13 (34.2)	10 (26.3)	15 (39.5)	
Only received money or drugs	79 (22.2)	30 (38.0)	30 (38.0)	19 (24.0)		36 (45.6)	31 (39.2)	12 (15.2)	
Both received and paid	54 (15.2)	17 (31.5)	20 (37.0)	17 (31.5)		21 (38.9)	13 (24.1)	20 (37.0)	

Reported STI Testing Pattern						Last HIV test		
Total (n=356)	Regular STI Testers (n=130)	Irregular STI testers (n=109)	Never tested for STIs (n=117)	p-value	In the last year (n=150)	More than one year ago (n=103)	Never tested for HIV (n=103)	p-value
N (%)	N (%)	N (%)	N (%)		N (%)	N (%)	N (%)	
Trust partner's HIV/STI Status								
				0.27				0.98
Not like me	167 (46.9)	61 (36.5)	43 (25.8)	63 (37.7)	72 (43.1)	47 (28.1)	48 (28.7)	
Some trust	178 (50.0)	65 (36.5)	63 (35.4)	50 (28.1)	74 (41.6)	53 (29.8)	51 (28.7)	
Just like me	11 (3.1)	4 (36.4)	3 (27.3)	4 (36.4)	4 (36.4)	3 (27.3)	4 (36.4)	
Trust Partner				0.49				0.12
Not like me	133 (37.4)	55 (41.4)	36 (27.1)	42 (31.6)	60 (45.1)	42 (31.6)	31 (23.3)	
Some trust	199 (55.9)	69 (34.7)	65 (32.7)	65 (32.7)	83 (41.7)	56 (28.1)	60 (30.2)	
Just like me	24 (6.74)	6 (25.0)	8 (33.3)	10 (41.7)	7 (29.2)	5 (20.8)	12 (50.0)	

^a 11 missing values

^b 27 missing values

^c 3 missing values (among those who have been tested)

Table 2

Crude and adjusted prevalence odds ratios and 95% confidence intervals for HIV frequency using logit regression models

Correlate	STI Testing Pattern				Last HIV Test			
	Never vs. Regular		Never vs. Irregular		Never vs. In past year		Never vs. Not in past year	
	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)
<i>Age category (years)</i>								
15–19	4.55 (1.16–17.86)	Removed	8.72 (1.05–72.48)	Removed	5.50 (1.40–21.61)	Removed	9.73 (1.17–81.30)	Removed
20–24	1.86 (0.89–3.93)	Removed	2.38 (0.97–5.86)	Removed	1.76 (0.84–3.71)	Removed	2.39 (0.96–5.98)	Removed
25–29	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>
30–34	1.03 (0.50–2.13)	Removed	0.57 (0.27–1.20)	Removed	0.77 (0.37–3.12)	Removed	0.49 (0.22–1.09)	Removed
35–39	0.80 (0.33–1.98)	Removed	0.46 (0.18–1.16)	Removed	0.46 (0.18–1.18)	Removed	0.54 (0.19–1.55)	Removed
40+	0.69 (0.28–1.72)	Removed	0.47 (0.18–1.21)	Removed	0.94 (0.37–2.38)	Removed	0.47 (0.18–1.20)	Removed
<i>Location of survey completion</i>								
Bangkok	—	—	—	—	0.52 (0.30–0.88)	Removed	0.73 (0.41–1.29)	Removed
Outside Bangkok	—	—	—	—	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>
<i>Usual anal sex position</i>								
Mostly Bottom	1.24 (0.66–2.34)	Removed	2.14 (1.10–4.17)	Removed	—	—	—	—
Mostly Top	0.99 (0.50–1.95)	Removed	0.94 (0.48–1.86)	Removed	—	—	—	—
Both	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	—	—	—	—
<i>Frequency of STI testing</i>								
Never been tested	—	—	—	—	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>	<i>Referent</i>
Irregular or symptomatic	—	—	—	—	0.05 (0.02–0.13)	0.05 (0.02–0.13)	0.02 (0.01–0.05)	0.02 (0.01–0.05)
Regular	—	—	—	—	<0.01 (<0.01–0.01)	<0.01 (<0.01–0.01)	0.03 (0.01–0.16)	0.03 (0.01–0.16)
<i>Last HIV test</i>								

	STI Testing Pattern				Last HIV Test			
	Never vs. Regular		Never vs. Irregular		Never vs. In past year		Never vs. Not in past year	
Correlate	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)
Never been tested	Referent	Referent	Referent	Referent	—	—	—	—
More than one year ago	0.03 (0.01–0.16)	0.03 (0.01–0.16)	0.02 (0.01–0.05)	0.02 (0.01–0.05)	—	—	—	—
In the past year	<0.01 (<0.01–0.01)	<0.01 (<0.01–0.01)	0.05 (0.02–0.13)	0.04 (0.02–0.12)	—	—	—	—
<i>STI in past year</i>								
Had a STI in past year	0.52 (0.27–1.00)	Removed	0.67 (0.34–1.35)	Removed	0.50 (0.26–0.97)	Removed	0.81 (0.38–1.70)	Removed
No STI in past year	Referent	Referent	Referent	Referent	Referent	Referent	Referent	Referent
<i>Reported HIV status</i>								
Positive	0.00 (0.00–999.99)	Removed	0.00 (0.00–999.99)	Removed	0.00 (0.00–999.99)	Removed	0.00 (0.00–999.99)	Removed
Negative	0.12 (0.06–0.21)	Removed	0.46 (0.27–0.79)	Removed	0.11 (0.06–0.19)	Removed	0.29 (0.16–0.52)	Removed
Don't know or want to say	Referent	Referent	Referent	Referent	Referent	Referent	Referent	Referent
<i>Condom use during anal sex</i>								
Inconsistent or never	—	—	—	—	Referent	Referent	Referent	Referent
Always consistent	—	—	—	—	0.56 (0.33–0.92)	Removed	0.70 (0.41–1.22)	Removed
<i>Sexual transactions</i>								
None	—	—	—	—	Referent	Referent	Referent	Referent
Only paid items for sex	—	—	—	—	0.48 (0.23–1.00)	Removed	0.34 (0.16–0.73)	Removed
Only received items for sex	—	—	—	—	1.36 (0.68–2.74)	Removed	1.35 (0.61–2.99)	Removed
Both received and paid	—	—	—	—	1.65 (0.73–3.73)	Removed	1.31 (0.54–3.19)	Removed