

# Evidence of a previously undocumented epidemic of HIV infection among men who have sex with men in Bangkok, Thailand

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**Background:** The HIV prevalence and associated risk behaviours in Thai men who have sex with men (MSM) are unknown. This information is crucial to inform and implement targeted preventive interventions for this population.

**Methods:** A cross-sectional assessment, using venue-day-time sampling, was conducted. Participants were 1121 Thai men who were 18 years or older, were residents of Bangkok, and reported anal or oral sex with a man during the past 6 months. Oral fluid specimens were tested for HIV antibody. Demographic and behavioural data were collected using an interviewer-administered Palm based automated questionnaire.

**Results:** HIV prevalence was 17.3% (194 of 1121). Mean age was 26.9 years (median 25 years), and university education was completed by 42.5%. Sex with men and women during the past 6 months was reported by 22.3%; sex with a woman ever, 36%; and unprotected sexual intercourse during the past 3 months, 36.0%. Alcohol use during the past 3 months was common (73.7%); drug use was rare (2.5%). Multivariate logistic regression analyses showed lower education, recruitment from a park, self-identification as homosexual, receptive and insertive anal intercourse, more years since first anal intercourse, and more male sex partners to be significantly and independently associated with HIV prevalence.

**Conclusions:** HIV infection is common among MSM in Bangkok. HIV prevention programs are urgently needed to prevent further spread of HIV in this young and sexually active population.

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## Introduction

Thailand has been widely recognized as an example of effective HIV control [1,2]. After HIV infection was found spreading rapidly among female sex workers and their clients in the early 1990s, the Thai government implemented its '100% condom use in commercial sex programme' which successfully targeted these populations [3,4]. A few years later, HIV prevalence indicators in the general population started to fall, as indicated by the decline in prevalent HIV infection among military recruits from 4% in 1993 to 0.5% in 2001, and among pregnant women from 2.3% in 1995 to 1.2% in 2003 [5,6]. Consequently, the number of new HIV infections decreased from an estimated 143 000 cases in 1991 to 19 000 cases in 2003 [7].

Despite these successes, concern exists that HIV is spreading in other at-risk populations in Thailand, such as men who have sex with men (MSM). Research among young Thai males has shown varying percentages (3.3 to 16.0%) of men reporting same-sex experience and the number of MSM may therefore be large [8–12]. However, no sentinel HIV surveillance has been conducted for MSM and because of the stigmatized nature of homosexuality in Thailand, AIDS cases among MSM may be under-reported. Indeed, of the 236 099 AIDS cases reported up to March 2004, only 2280 (1%) were categorized as in homo- or bisexual men [13]. Some sentinel HIV surveillance data are available for male sex workers and prevalence rates of up to 20% have been observed [14]. However, these men mostly identify as heterosexual [15] and may not be representative of the spread of HIV among MSM. The only population-based data have come from studies of Royal Thai Army conscripts. These young men provide relatively representative samples of all but the most socially advantaged sectors of Thai society, but are constrained by their limited range of age. These studies have suggested an increased risk for HIV infection among men reporting male sex partners, particularly during the middle of the 1990s, but less so in more recent years, when injecting drug use became the main risk factor for HIV infection [9,12]. Therefore, in this assessment we aimed to assess the HIV prevalence and associated risk behaviours in a community-based sample of Thai MSM. These data are essential to inform preventive interventions, services, and research among MSM.

## Methods

### Sampling

Venue-day-time sampling (VDTS) was used to access and recruit participants. VDTS establishes a set of venues where hard-to-reach populations congregate, from which individuals are sampled on various days of the

week and times of the day [16]. In brief, we used four distinct and consecutive phases: (1) venue identification and mapping; (2) counting of male venue attendees; (3) determination of eligibility and willingness to participate in the assessment among venue attendees; and (4) recruitment of participants. We identified and mapped 225 MSM venues in metropolitan Bangkok, of which 64 were excluded because they lacked proprietor support for the assessment, were considered too unsafe or logistically too difficult to access. To ensure that we recruited a community-based sample of native Thai MSM, a further 119 venues were excluded because they provided commercial sex services or were frequented by large numbers of foreign MSM. Of the 42 venues that were selected for enumeration of attendees, 18 were eliminated because few MSM attended them. Enumeration of eligibility and willingness to participate was conducted at 24 venues, of which 10 were eliminated due to ineligibility and unwillingness among venue attendees to participate, leaving 14 venues (six saunas, four parks and four bars) for our assessment. A detailed description of VDTS procedures applied in our assessment can be found elsewhere [17].

### Assessment

Between April and May 2003, trained peer-interviewers approached venue attendees to screen for eligibility and recruitment. Eligible participants were male, at least 18 years old, Thai citizens, residents of Bangkok, and had oral or anal sex with a man in the past 6 months. After verbal informed consent and pre-test counselling, participants completed a Palm-based (Model Palm 500; Palm, Inc., Milpitas, California, USA) interviewer-administered questionnaire about demographics and sexual and drug use behaviours. An oral fluid specimen was then collected for HIV testing (Orasure Salivary Collection Device; Epitope Inc, Beaverton, Oregon, USA). Participants received a soft-drink, a written copy of the informed consent script, HIV prevention materials, a bar-coded identification card for getting their HIV test results and post-test counselling, and 350 baht (US\$ 8.50) for their time and costs of travel to the HIV testing clinic to collect their HIV test results. The interviews and oral specimens were linked through the bar code, but data collection was otherwise anonymous.

Of the 1243 men who were screened, 1121 (90.2%) were enrolled and completed the assessment; 79 (6.4%) did not meet eligibility criteria, 35 (2.8%) were eligible but unwilling to participate, and 8 (0.6%) did not complete the interview. Accrual rates did not significantly vary by venue type or location. The assessment protocol was determined to be a surveillance activity by the US Centers for Disease Control and Prevention which, consequently, did not require an IRB review. It was reviewed and approved by the Research in Human Subjects Committee of the Thailand Ministry of Public Health.

### Laboratory testing

Specimens were tested for HIV antibodies with an enzyme immunoassay test for oral fluids (Oral Fluid Vironostika HIV Microelisa System; Organon Teknika Corporation, Durham, North Carolina, USA). Specimens testing positive were retested using enzyme immunoassay and confirmed with Western blot (Orasure HIV-1 Western Blot; Organon Teknika Corporation). A specimen was considered HIV-positive if it reacted in two out of the three tests. Testing of oral fluid for the detection of HIV antibodies has shown results similar to the testing of serum, with a sensitivity and specificity of 99.8 to 100% [18,19].

### Statistical analysis

Risk factors for HIV prevalence were analyzed by allowing independent variables with bivariate *P*-values of 0.1 or less to be further evaluated in generalized estimating equation logistic regression analysis, adjusting for clusters of venues and calendar dates using Stata (Version 8.1, 2003; Stata Corp., College Station, Texas, USA).

## Results

### HIV prevalence and demographic and behavioural characteristics of participants

Of the 1121 participants 194 (17.3%) were HIV infected. The mean age of the overall sample was 26.9 years (median 25 years), 474 (42.5%) had completed university education, 548 (48.9%) lived with family and 423 (37.3%) were born in Bangkok (Table 1). During the 6 months prior to the assessment, 249 (22.3%) reported having had sex with both men and women; 404 (36.0%) reported having ever had sexual intercourse with a woman. Having ever had a steady sex partner was reported by 582 (51.9%), and having ever had one or more casual partners was reported by 838 (74.8%). Having had male, female, and transgender steady partners during the 3 months prior to the assessment was reported by 514 (45.9%), 106 (9.5%) and 15 (1.3%) participants, respectively. Having had male, female, and transgender casual partners during the previous 3 months was reported by 732 (65.3%), 93 (8.3%), and 21 (1.9%) participants, respectively. Having had unprotected sexual intercourse with steady or casual partners during the previous 3 months was reported by 404 (36.0%) participants. Alcohol consumption during the past 3 months was reported by 826 (73.7%), and any illegal drug use [methamphetamine, MDMA (ecstasy), ketamine, sedatives, marijuana or inhalants] during this period by 40 (3.6%); 145 (12.9%) reported having ever used any of these drugs. One participant reported having ever injected drugs. Of the 491 (43.8%) who ever had an HIV test, none reported themselves to be HIV infected. Sixty (5.4%) participants returned to get their HIV test results, of whom eight (13.3%) were HIV positive.

### Bivariate and multivariate analyses of risk factors for prevalent HIV infection

Lower education, being born outside Bangkok, being recruited at a park (versus an entertainment venue), having sex with men only (versus having sex with men and women), self-identifying as homosexual or gay (versus bisexual, heterosexual or transgender), practicing both insertive and receptive intercourse (versus insertive or receptive only), having ever received money for sex, having ever had a genital sore or ulcer, being unwilling to reveal the result of a prior HIV test, being older, having more years since first anal intercourse, and having a higher number of lifetime male anal sex partners were significantly associated with increased HIV prevalence (Table 1).

In multivariate analyses, lower education, being recruited at a park, self-identifying as homosexual, practising both insertive and receptive anal intercourse, more years since first anal intercourse and having a higher number of lifetime male anal sex partners were significantly and independently associated with increased HIV prevalence (Table 1).

## Discussion

Our assessment shows that despite Thailand's remarkable success in controlling the HIV epidemic among the general population, the HIV prevalence among MSM was found to be surprisingly high. Although Thailand's status as an enlightened example of effective HIV control remains, the characterization of the epidemic in smaller population groups poses new challenges. The first step, to document the HIV prevalence among MSM, has now been completed. Next steps should include increased HIV/AIDS prevention services, creation of community awareness and support, mobilization of resources and political commitment and a research and surveillance infrastructure for MSM. The Thai government is now actively working with its partners to realize these steps.

The results of our assessment may be helpful in this respect. Consistent with research conducted in the Western world [20], anal intercourse and increased sexual activity were the main risk factors for HIV infection. Low levels of injection or other illegal drug use were found, suggesting that among Bangkok MSM, HIV is predominantly transmitted through sexual activity. However, some under-reporting of drug use may have been likely, probably as a consequence of the central government's ongoing law-enforcement and suppression of drug use and trafficking. Alcohol consumption appeared to be slightly protective against HIV infection in bivariate analysis and was not a significant factor in multivariate analyses. The lower background HIV prevalence in entertainment venues (where alcohol is typically

**Table 1. Prevalence and risk factors for HIV infection among men who have sex with men in Bangkok.**

Categorical variables	Total <i>n</i> (%)	HIV-positive <i>n</i> (%)	Univariate		Multivariate	
			OR (95% CI)	<i>P</i> -value	OR (95% CI)	<i>P</i> -value
Overall	1121 <sup>a</sup> (100)	194 (17.3)				
Education						
≤ Secondary	206 (18.4)	46 (22.3)	1.51 (1.02–2.23)	0.08	1.79 (1.12–2.82)	0.03
Vocational	441 (39.3)	77 (16.3)	1.02 (0.67–1.55)		1.35 (0.87–2.00)	
University	474 (42.3)	76 (16.0)	1		1	
Living situation						
Family	548 (48.9)	101 (18.4)	1.41 (0.93–2.13)	0.22		
Alone	276 (24.6)	52 (18.8)	1.45 (0.92–2.27)			
Partner/friend	297 (26.5)	41 (13.8)	1			
Birthplace						
Bangkok	423 (37.7)	85 (20.1)	1.36 (1.03–1.78)	0.03		
Outside Bangkok	698 (62.3)	109 (15.6)	1			
Recruitment venue						
Entertainment	376 (33.5)	49 (13.0)	1		1	
Sauna	367 (32.7)	62 (16.9)	1.36 (0.87–2.09)		1.28 (0.82–1.98)	
Park	378 (33.7)	83 (22.0)	1.88 (1.29–2.72)	0.003	1.71 (1.21–2.41)	0.007
Alcohol (past 3 months)						
No	295 (26.3)	61 (20.7)	1			
Yes	826 (73.7)	133 (16.1)	0.74 (0.50–1.08)	0.12		
Drugs (ever)						
No	976 (87.1)	172 (17.6)	1			
Yes	145 (12.9)	22 (15.2)	0.84 (0.46–1.51)	0.6		
Sex with woman (past 6 months)						
Yes	249 (22.3)	28 (11.2)	1			
No	869 (77.7)	165 (19.0)	1.85 (1.24–2.76)	0.003		
Sexual orientation						
Hetero/bi/transgender	269 (24.0)	28 (10.4)	1		1	
Homosexual and gay	852 (76.0)	166 (19.5)	2.08 (1.52–2.86)	0.001	1.92 (1.12–3.32)	0.02
Gender identification						
Male	996 (88.8)	171 (17.2)	0.98 (0.43–2.25)	0.8		
Female	83 (7.4)	16 (19.3)	1.13 (0.42–3.00)			
Neither	40 (3.6)	7 (17.5)	1			
Anal sex roles (ever)						
Insertive	525 (47.8)	77 (14.7)	1		1	
Receptive	197 (17.9)	29 (14.7)	1.00 (0.62–1.62)		1.51 (0.96–2.38)	
Both	376 (34.2)	85 (22.6)	1.70 (1.16–2.48)	0.002	1.82 (1.23–2.70)	0.007
Always used condom with male steady partner <sup>b</sup> (past 3 months)						
No	230 (45.6)	51 (22.2)	1.49 (0.84–2.65)	0.17		
Yes	274 (54.4)	44 (16.1)	1			
Always used condom with male casual partner <sup>b</sup> (past 3 months)						
No	153 (20.9)	34 (22.2)	1.33 (0.81–2.21)	0.26		
Yes	578 (79.1)	102 (17.6)	1			
Received money for sex (ever)						
No	974 (97.7)	164 (16.8)	1			
Yes	23 (2.3)	7 (30.4)	2.16 (1.03–4.53)	0.04		
Ulcer or sore on genitals (ever)						
No	1023 (91.3)	167 (16.3)	1			
Yes	98 (8.7)	27 (27.6)	1.95 (1.23–3.09)	0.005		
Had HIV test (ever)						
No	630 (56.2)	108 (17.1)	1			
Yes	491 (43.8)	86 (17.5)	1.03 (0.76–1.38)	0.9		
HIV test result						
Not tested	630 (56.2)	108 (17.1)	1			
Negative	462 (41.2)	76 (16.5)	0.95 (0.68–1.32)			
Would not disclose	29 (2.6)	10 (34.5)	2.54 (1.08–5.98)	0.096		

(continued overleaf)

Table 1. (continued)

Interval variables	HIV-negative mean (SD)	HIV-positive mean (SD)	Univariate		Multivariate	
			OR (95% CI)	P-value	OR (95% CI)	P-value
Age (years) <sup>c</sup>	26.6 (6.4)	28.0 (6.0)				
Linear			1.07 (1.03–1.11)	0.001		
Anal intercourse exposure <sup>d</sup> (years)	7.5 (6.3)	9.4 (6.3)			1.06 (1.02–1.11)	0.001
≤ 13			1.09 (1.05–1.14)	0.001		
> 13			0.96 (0.90–1.03)	0.32		
Number of lifetime male anal sex partners <sup>e</sup>	41.3 (108.8)	54.3 (56.7)				
Log scale			1.26 (1.11–1.44)	0.001	1.16 (1.03–1.30)	0.02
Number times ≥ 5drinks (past 3 months)	11.8 (19.4)	8.8 (15.2)				
Linear			0.99 (0.98–1.01)	0.02		

<sup>a</sup>Totals may slightly vary due to missing values.

<sup>b</sup>Calculated among those who reported steady or casual partners, respectively; a steady partner was defined as 'somebody you have sex with regularly and feel an emotional bond with, such as feelings of love'; a casual partner was defined as 'somebody you have sex with only without the exchange of money and feel no emotional bond with'.

<sup>c</sup>Age was related to HIV-prevalence as an inverted U-shape curve (data not shown) and was therefore modeled as a second-order polynomial, ( $\chi^2 = 19.9$ ; 2 d.f.;  $P < 0.001$ ).

<sup>d</sup>Years since first anal intercourse exposure (i.e., current age minus age at first anal intercourse) were related to HIV-prevalence as a monotonic increasing trend until 13 years, and then the risk decreased. The variable was modeled as a piecewise linear spline with a single knot at 13 years, ( $\chi^2 = 6.86$ ; 1 d.f.;  $P < 0.01$ , for change in slope at 13 years).

<sup>e</sup>Since number of lifetime male sexual partners was skewed by a small number of outliers, the variable was transformed on the log-scale for analyzing the effect on HIV-prevalence. OR, odds ratio; CI, confidence interval.

consumed) in comparison with the HIV prevalence in parks and saunas may account for some of this counter-intuitive finding. Prevention activities should therefore focus on sexual behaviour, such as reduction of sex partners, increased condom use, and increasing awareness of risk associated with specific practices.

The significant proportion of men reporting sex with men and women can potentially spread HIV into the general population. Targeted efforts are needed to increase condom use in this group, as women may not be aware of the homosexual activities of their male partners.

Our findings reflect HIV prevalence and risk behaviour among sexually active MSM attending venues in Bangkok. Our sampled venues were not exhaustive and there may be other types of settings (e.g., internet, informal social networks) where risk may differ from what we observed. The risk for HIV infection may also differ for MSM in other areas of the country. However, our analysis suggests that the HIV prevalence among MSM from outside Bangkok may be lower. About two-thirds of our sample had migrated to Bangkok from other parts of the country, which was protective for HIV infection in bivariate analysis.

Given the overall HIV prevalence of 17.3% in our sample, it is remarkable that none of the 491 men who had a previous HIV test, reported to be HIV positive. Given the widespread stigmatization and discrimination against HIV-infected persons in Thailand, some men may have decided not to disclose their positive HIV status. Indeed, non-disclosure of HIV test results appeared to be

significantly associated with prevalent HIV infection in our bivariate analysis. On the other hand, HIV testing without returning test results is common place in Thailand (military, health care settings, pre-employment screening) and some of our results may reflect this situation. However, for preventive purposes and because of the increasing availability of highly active antiretroviral therapy in Thailand, voluntary HIV counselling and testing for MSM needs to be increased.

The high HIV prevalence found among MSM in Thailand coincides with reports of previously undocumented epidemics of HIV infection among MSM in China, Cambodia, and Indonesia and of ongoing HIV transmission among MSM in the Western world [20–24]. The continuing spread of HIV among MSM highlights the urgent need for more effective behavioural and biomedical interventions to halt the spread of HIV infection in this population.

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## Appendix

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