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# Knowledge of and Interest in Using Pre-Exposure Prophylaxis for HIV Prevention among Men Who Have Sex with Men in Thailand

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R. Craig Sineath, MPH<sup>1</sup>, Catherine Finneran, MPH<sup>2</sup>,  
Patrick Sullivan, DVM, PhD<sup>1</sup>, Travis Sanchez, DVM, MPH<sup>1</sup>,  
Dawn K. Smith, MD, MS, MPH<sup>3</sup>, Frits van Griensven, PhD<sup>4</sup>,  
Wipas Wimonsate, MS, MRP<sup>5</sup>, and Rob Stephenson, PhD<sup>2</sup>

## Abstract

Little is known about HIV pre-exposure prophylaxis (PrEP) acceptability among men who have sex with men (MSM) in Thailand. The authors recruited an online convenience sample of Thai MSM ( $n = 404$ ) to assess the knowledge of and interest in PrEP. Less than 7% had heard of PrEP; however, 35% indicated interest in PrEP after an explanation of its possible efficacy. Regression modeling demonstrated that HIV knowledge and risk behavior, but not demographics, are significant predictors of PrEP interest. More information and education about PrEP is necessary and more research is needed to examine PrEP acceptability and to inform the message for PrEP uptake.

## Keywords

HIV, PrEP, MSM, Thailand

## Introduction

In Thailand and worldwide, men who have sex with men (MSM) have been disproportionately affected by HIV/AIDS since the beginning of the epidemic.<sup>1</sup> Current Thai surveillance shows prevalence and incidence of HIV in these populations are still rising. In Bangkok, HIV prevalence among MSM recruited through venue-based sampling increased from 17.3% in 2003 to 30.8% in 2007, with incidence increasing from 4.1% to 7.7% in the same years.<sup>2</sup> Given the evidence of the growing HIV epidemic among MSM in Thailand, the Thai government has promoted the development of prevention strategies for MSM and has incorporated MSM as a priority group for HIV prevention in the National Plan for the Strategic and Integrated HIV/AIDS Prevention Alleviation (2007-2011).<sup>3</sup>

Many best-evidence HIV prevention strategies, including those endorsed by the Thai government,<sup>3</sup> focus on behavioral changes such as routine HIV testing, increasing condom use, and addressing substance abuse.<sup>4</sup> However, the results from the recent multicountry iPrEx (Pre-exposure Prophylaxis Initiative) efficacy trial of daily oral tenofovir (TDF)/emtricitabine (FTC) fixed-dose combination (FDC) for the prevention of HIV infection among MSM (including a site in northern Thailand) showed an overall efficacy of 44%.<sup>5</sup> With high adherence as measured by detection of TDF/FTC in blood samples, efficacy in prevention of HIV infection was greater than 90%.<sup>6</sup>

Given these results, and the Thai government's recent focus on HIV prevention among MSM, it is possible that HIV pre-exposure prophylaxis (PrEP) could be added to Thailand's prevention tools for MSM alongside Thailand's commitment to provide access to antiretroviral drugs for Thai nationals living with HIV.<sup>3</sup>

In order to determine the impact of implementing PrEP among MSM in Thailand, more needs to be known about this population's willingness and interest to use these drugs for HIV prevention. Currently, no published data exist on the acceptability and interest or disinterest in use of PrEP among Thai MSM. Therefore, we examined the factors associated with

<sup>1</sup> Department of Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, USA

<sup>2</sup> Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA, USA

<sup>3</sup> Division of HIV/AIDS Prevention, NCHHSTP, Centers for Disease Control and Prevention, Atlanta, GA, USA

<sup>4</sup> Institute of Global Health, University of California, San Francisco, CA, USA

<sup>5</sup> Thailand Ministry of Public Health–U.S. Centers for Disease Control and Prevention Collaboration, Nonthaburi, Thailand

## Corresponding Author:

R. Craig Sineath, Department of Epidemiology, Rollins School of Public Health, Emory University, 1518 Clifton Rd NE, Atlanta, GA 30322, USA.

Email: rsineat@emory.edu

**Table 1.** Characteristics of the Sample and Mean Scale Index Scores in Total and by Outcome.

Characteristic	Heard of PrEP n (row %) <sup>a</sup>	Interested in PrEP n (row %) <sup>a</sup>	Total n (col. %) <sup>a</sup>
Total	28 (7)	144 (36)	404 (100)
Age, mean (SD)	25 (5.4)	26 (7.3)	26 (7.1)
Employment			
Yes	21 (9)	82 (34)	244 (60)
No	7 (4)	62 (39)	160 (40)
≥12 Years of education			
Yes	16 (6)	93 (34)	277 (69)
No	12 (9)	51 (40)	127 (31)
Race			
Thai	25 (7)	136 (36)	381 (95)
Other	3 (14)	8 (38)	21 (5)
Currently in relationship			
Yes	15 (7)	87 (40) <sup>b</sup>	216 (53)
No	13 (7)	57 (30) <sup>b</sup>	188 (47)
Sexual orientation			
Homosexual/gay	22 (6) <sup>b</sup>	132 (36)	368 (91)
Other	6 (17) <sup>b</sup>	12 (33)	36 (9)
Knows where to get condoms			
Yes	23 (10) <sup>b</sup>	81 (36)	227 (56)
No	5 (3) <sup>b</sup>	63 (36)	177 (44)
Ever tested for HIV			
Yes	19 (9)	75 (35)	216 (47)
No	9 (5)	69 (37)	188 (53)
Used drugs last year			
Yes	10 (8)	52 (42)	123 (31)
No	18 (6)	91 (33)	279 (69)
UAI at last sex			
Yes	12 (7)	61 (36)	171 (44)
No	15 (7)	81 (37)	221 (56)
AI at last sex			
Yes	21 (7)	121 (38) <sup>b</sup>	317 (79)
No	7 (8)	23 (26) <sup>b</sup>	87 (22)
Knows where to get tested			
Yes	22 (7)	99 (33)	296 (74)
No	5 (5)	43 (41)	105 (26)
Social pressures (4-20), mean (SD) <sup>c</sup>	9.8 (5.0)	10.2 (5.4)	10.3 (5.2)
Ability to stay negative (1-5), mean (SD) <sup>c</sup>	3.8 (1.2)	3.7 (1.3)	3.8 (1.3)
HIV severity: your partner (1-5), mean (SD) <sup>c</sup>	4.1 (1.3)	4.4 (1.2)	4.4 (1.1)
HIV severity: you (1-5), mean (SD) <sup>c</sup>	3.8 (1.3)	4.3 (1.2)	4.4 (1.2)
Risk of HIV (1-5), mean (SD) <sup>c</sup>	3.5 (2.3)	4.1 (2.5)	3.6 (2.4)

Abbreviations: PrEP, HIV pre-exposure prophylaxis; UAI, unprotected anal intercourse; SD, standard deviation.

<sup>a</sup> Except where noted.

<sup>b</sup> Significant difference ( $\alpha = .05$ ).

<sup>c</sup> Scoring for variable is indicated in first set of parentheses.

PrEP knowledge and interest among an online recruited convenience sample of Thai MSM.

## Methods

We placed banner advertisements on Facebook in February and March 2012, targeting men over 18 indicating an “interest in” men and residence in Thailand on their profiles. After clicking on an advertisement, potential respondents were led to an eligibility screener. Eligibility criteria were age over 18 years and reporting having had sex with a man in the past year. We

collected data on demographic characteristics, sexual behaviors, and interest in and knowledge of PrEP (Table 1). Because PrEP is designed to prevent HIV infection, men who reported living with HIV were excluded from analysis. This study was considered by Emory University’s Institutional Review Board and found exempt from review since no identifying information was collected and the study posed little risk for participants; thus men were shown a short paragraph about the study procedures at the beginning of the survey. No written consent was needed. All survey and advertising components were in the Thai language.

Familiarity and interest in PrEP use were measured in 3 domains: ever hearing of PrEP (Have you heard about taking Truvada to prevent HIV infection?), interest in using PrEP (Would you be interested in taking Truvada to prevent HIV infection?), and willingness to pay to use PrEP (How much would you be willing to pay each month to take Truvada to reduce your risk of HIV infection?). A paragraph briefly outlining the results of the iPrEx study was shown before interest in PrEP was assessed and after asking about PrEP knowledge (Note 1). Respondents indicating interest or disinterest in taking PrEP were asked to select the reasons for their interest or lack thereof. Additionally, respondents indicating disinterest in PrEP use were allowed to select reasons that they would reconsider PrEP use in the future from a list.

The data were analyzed using SAS v9.3 (SAS Institute Inc, Cary, NC, USA). Chi-square analyses were used to determine differences in demographic characteristics across response options. Logistic regression models were fitted using stepwise backward elimination to examine factors significantly associated with having heard of and willingness to use PrEP. Demographic variables age, employment status (employed or unemployed), and education level (less than or greater than 12 years of education) were considered potential confounders and controlled for in both models. Potential predictors of knowledge or interest in PrEP that were considered included self-identified risk of contracting HIV in lifetime (range 1-10), being in a sexual relationship (with any person), sexual orientation, perceived seriousness of contracting HIV (range 1-5), perceived seriousness of a respondent's partner contracting HIV (range 1-5), knowing where to receive free condoms, self-reported ability to stay HIV-negative in lifetime (range 1-5), ever testing for HIV, social pressures (pressure to hide sexual orientation, have sex with women, marry a woman, and have children summed range 4-20), drug use in past year, having had anal sex at most recent sex, and knowing where to get tested for HIV.

## Results

Of the 470 respondents who completed the survey, 404 (86%) answered all covariates of interest and were included in the analyses. Demographic characteristics and results of univariate analysis are summarized in Table 1. The sample was young, predominately identified as homosexual/gay, and Thai. The majority reported  $\geq 12$  years of education and having current employment. HIV risk behaviors were high, with nearly half the sample reporting never having been tested for HIV and having unprotected anal intercourse (UAI) at last sex. Respondents identified themselves as relatively at low risk for contracting HIV over their lifetimes (mean 3.6 out of 10) and having high ability to remain HIV negative (mean 3.8 out of 5).

Few respondents (7%) reported having heard of PrEP, but once shown a paragraph describing PrEP, approximately one-third (36%) reported interest in using it. Little significant correlation was observed between demographic characteristics and these 2 outcomes. Among 144 PrEP-interested men, the

most commonly selected reasons for interest were "I am interested in extra ways to protect myself from HIV" ( $n = 108$ , 75%), "I have had unprotected sex in the past, and may do so in the future" ( $n = 94$ , 65%), and "I have a sex partner(s) whose HIV status I don't know" ( $n = 76$ , 53%). Men who reported lack of interest in using PrEP ( $n = 260$ ) selected a variety of reasons, the most common being "My partner doesn't have HIV" ( $n = 122$ , 47%) and "I use condoms 100% of the time" ( $n = 98$ , 38%). Men uninterested in PrEP also cited concerns over the actual PrEP regimen, including "I don't want to have to take medication every day" ( $n = 89$ , 34%) and "I don't want to go see my doctor every three months" ( $n = 73$ , 28%). There were doubts expressed by some as to the efficacy of PrEP compared to condom use; 35% of respondents uninterested in PrEP ( $n = 91$ ) indicated that "condoms are more effective [than PrEP]." However, a majority of men who reported a lack of interest in PrEP use indicated they could change their minds, including if "I start having unprotected sex" ( $n = 109$ , 42%) or if "There is more research that showed Truvada is more effective" ( $n = 95$ , 37%).

About a quarter of respondents (24%;  $n = 91$ ) indicated they would be unwilling to take TDF/FTC FDC even if it was free. The majority of respondents (65%;  $n = 191$ ) indicated they would be willing to pay for PrEP, though most of these respondents (65%;  $n = 125$ ) indicated they would only be willing to pay the minimum amount listed in the question options, 750 Thai baht (approximately US\$25), per month for PrEP.

The results of the logistic regression models are summarized in Table 2. Respondents were significantly more likely to have heard of PrEP if they reported current employment or homosexual/gay sexual orientation. Respondents who reported knowing where to obtain free condoms had 4.5 (95% CI: 1.6-13) times the odds of having heard of PrEP than men who did not. However, an inverse relationship between perceived HIV severity and knowledge of PrEP was also found. MSM who viewed HIV as a more severe threat were less likely to have heard of PrEP. Similarly, MSM who identified themselves as being at a high risk for HIV acquisition had significantly lower odds of being interested in using PrEP. Being in a relationship also significantly lowered the odds of interest in PrEP. Notably, neither age nor education level was significantly associated with knowledge of or interest in PrEP.

## Discussion

Despite low knowledge of PrEP, approximately one-third of this convenience sample of Thai MSM reported interest in using PrEP to prevent HIV infection once it was described to them. The data further suggest that factors related to an individual's overall HIV knowledge and HIV risk perception profile correlated to knowledge of PrEP and interest in PrEP significantly more than age and education. For example, respondents indicating disinterest in using PrEP most commonly ascribed this to having an HIV-negative partner. A recent analysis of a survey among US MSM demonstrated that the majority

**Table 2.** Backward-Eliminated Logistic Regression Model Results.

Characteristic	Heard of PrEP	Interested in PrEP
Age	0.96 (0.90, 1.0)	0.99 (0.96, 1.0)
Employed	<b>3.1 (1.2, 8.4)<sup>b</sup></b>	1.4 (0.88, 2.2)
>12 years of education	0.65 (0.28, 1.5)	1.4 (0.89, 2.2)
Risk of HIV	–	<b>0.89 (0.81, 0.97)<sup>b</sup></b>
Currently in relationship	–	<b>0.63 (0.41, 0.96)<sup>b</sup></b>
Homosexual/gay sexual orientation	<b>4.14 (1.4, 12)<sup>b</sup></b>	–
HIV severity	<b>0.74 (0.56, 0.97)<sup>b</sup></b>	–
Knowing where to get free condoms	<b>4.5 (1.6, 13)<sup>b</sup></b>	–

Abbreviation: PrEP, HIV pre-exposure prophylaxis.

<sup>a</sup> N = 404. Variables not included in the model are denoted as “–.” Significant differences at  $\alpha = .05$  are denoted in **boldface and italics**.

<sup>b</sup> Indicates a significant difference ( $\alpha = .05$ ).

(68%) of incident HIV infections among MSM were attributable to main partnerships.<sup>7</sup> Although it remains unknown whether this is also true in Thailand, Thai MSM may be similarly assuming that being in a relationship lowers the risk of HIV infection and thus engage in higher risk behaviors with main partners.

Paradoxically, we observed an inverse relationship between perceived risk of HIV infection and interest in PrEP; men who reported higher HIV risk perception were significantly less interested in using PrEP. However, this paradox is perhaps mediated by respondents' expectation that future changes in their risk behavior could increase their interest in using PrEP. If MSM can accurately anticipate future increases in sexual risk, then this may also have HIV prevention applications, such as indicating a need for individual risk reduction counseling. Alternatively, a subset of respondents may be fatalistic about becoming HIV infected; and despite their best efforts to prevent infection, they may prefer to wait and take TDF/FTC FDC for HIV treatment when infection occurs.

While there are still many unknowns about PrEP use among MSM in Thailand and elsewhere, these results demonstrate that many Thai MSM desire additional effective ways to protect themselves from HIV infection. This indicates that MSM should be advised about PrEP as evidence is emerging and as international guidelines for its use are being developed. Additionally, any attempt to introduce PrEP regimens to Thai MSM must consider that the majority of MSM willing to use PrEP indicated that their willingness was contingent upon low cost (<US\$25 per month).

### Limitations

These self-reported data were drawn from Internet-using Thai MSM with current Facebook accounts and therefore are not generalizable to the wider MSM population in Thailand or other countries. Few respondents reported having heard of PrEP, a factor that likely contributed to the wide confidence intervals in the results. Furthermore, the survey only conveyed general information about PrEP; Thai MSM may have different levels of PrEP interest when further educated about its efficacy or possible side effects. The survey was developed for a

multicountry site and did not consider the complex gender identities in Thailand, such as kathoey or “lady boys.” Finally, the current literature suggests that PrEP may be most advantageous in certain subgroups, such as high-risk MSM. Willingness to use PrEP among these subgroups should be addressed in further research.

### Declaration of Conflicting Interests

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### Note

1. The paragraph read as follows: “Recently, research showed that gay/bisexual men who consistently took one pill of Truvada per day had minimal chances of getting HIV infection. Chances of getting HIV increased if Truvada was not taken every day. Truvada is a medication that is commonly used to treat HIV infection. To prevent HIV infection, you would need to take this medication every day whether you planned to have sex that day or not. The medication would have to be prescribed by a doctor who would need to see you at least every 3 months to test you for HIV infection. Some insurance companies may not pay for this use of Truvada and you might have to pay for it yourself. There are some side effects reported by people who start taking Truvada, mostly nausea and weight loss that goes away after the first month or so. In rare cases, Truvada taken for long periods can damage the kidneys.”

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