ACCESS TO HIV TESTING FOR SEX WORKERS IN BANGKOK, THAILAND: A HIGH PREVALENCE OF HIV AMONG STREET-BASED SEX WORKERS

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Abstract. We offered voluntary counseling and testing (VCT) for HIV and syphilis to women attending three public sexually transmitted infection (STI) clinics in Bangkok, Thailand from May 2004 to June 2006. The testing was performed at either one of three STI clinics in Bangkok or at mobile VCT in the same area as the outreach activity. Six-hundred eighty-four women were tested. The HIV prevalences among the street-based sex workers, brothel-based sex workers and other women in these areas not reporting sex work who tested in the clinics were 45.8% (38/83), 4.2% (10/236) and 9.9% (28/284), respectively. The prevalences of syphilis in these groups were 13.3%, 2.1%, and 2.6%, respectively. Street-based sex work and longer duration of sex work were independent risk factors for HIV infection ($p<0.001$ and $p=0.02$, respectively). HIV and syphilis prevalences were 21.0% and 3.7% among 81 street-based sex workers accepting mobile VCT. The street-based sex workers in Bangkok had substantially higher HIV and syphilis prevalences than other sex workers. Street-based sex workers should be sampled during routine surveillance to obtain systematic information on disease prevalence and risk behaviors in this group.

Key words: HIV testing, street, sex workers, syphilis

INTRODUCTION

The Royal Thai Government responded to the HIV epidemic in the early 1990s with the 100% condom program, requiring condom use in sex establishments and requiring sex workers to undergo periodic screening for HIV and sexually transmitted infections (STI) (Hanenberg *et al*, 1994). The government allocated significant funding for STI care and HIV prevention services. Successful implementation of the 100% condom program resulted in a decrease in HIV prevalence in most populations routinely included in surveillance (UNAIDS, 2001). Nationally, the HIV prevalence among brothel-based female sex workers decreased from 33.2% in 1994 (Ministry of Public Health, 1994) to 5.6% in 2007 (Min-

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istry of Public Health, 2006); syphilis seropositivity in this group decreased from 6.0% in 1998 to 1.2% in 2007 (Ministry of Public Health, 1989-2003). The Bangkok Metropolitan Administration (BMA) reported a 4% HIV prevalence and 2% syphilis seroprevalence among Bangkok sex workers in 2006a (Bangkok Metropolitan Administration, 2006a). However, street-based sex workers are not systematically included in routine surveillance and information on prevalence in this group is limited.

Funding for HIV prevention in Thailand declined as the overall HIV prevalence decreased. At the same time, decentralization of health care services has resulted in the integration of STI services into primary care clinics and a reduction in services directed to high-risk populations such as sex workers. The total number of female sex workers in Bangkok was estimated to be 15,423 in January 2006, according to an annual survey of brothels and entertainment venues (Bangkok Metropolitan Administration, 2006b). Reports from the Ministry of Public Health (MOPH) and BMA showed that 1,540 sex workers, just 10% of the estimated total, visited any of the ten public STI clinics in Bangkok during the same year (P Sirivongrangson and P Smutraprapoot, personal communication). However, others may have accessed care at hospitals or private clinics.

Sex work in Thailand has shifted in the last two decades to become increasingly based outside of brothels to so-called "indirect" settings, such as bars and massage parlors, or on the street and in parks (street-based sex workers) (Guest *et al*, 2007). Unlike many women working in establishments, street-based sex workers are not subject to requirements for periodic STI or HIV testing.

We promoted voluntary counseling and testing (VCT) for HIV and syphilis in street-based sex workers in one area of Bangkok by inviting them to come to the clinic or by providing HIV testing on-site. HIV and syphilis positivity rates were assessed among women who chose to get tested and risk factors for positive test results were evaluated.

MATERIALS AND METHODS

Population

VCT for HIV and syphilis have been provided as part of routine services for women, including sex workers, attending any of three public STI clinics in Bangkok from May 2004 onward. Through an ongoing HIV prevention program, street-based sex workers in one area of Bangkok (an area with a population with a low socio-economic status) were invited, from May 2005 onward, to attend any of the three STI clinics to receive free STI VCT. Transportation costs for street-based sex workers referred by outreach workers were reimbursed.

In the three STI clinics, demographic and risk behavior data were collected during face-to-face interviews as part of routine services. Women were asked about steady partners (emotional bond with partner known 3 months or longer), casual partners, condom use, and history of injecting drug use. Sex workers were also asked about clients, duration of sex work, and age at initiation of sex work. An opt-out approach for HIV testing was used with written informed consent being obtained prior to testing. Some venue-based sex workers came for HIV testing every 3 months. The most recent HIV test results during the study period were used for this population. Persons with positive screening for HIV were referred for confirmatory

HIV testing and a CD4 cell count, opportunistic infection prophylaxis and antiretroviral therapy, according to the Thai national guidelines for HIV care (Ministry of Public Health, 2004) and as part of MOPH programs (NAPHA, 2006). Women received testing and treatment for syphilis according to national STI treatment guidelines free of charge; partner management was also provided.

Mobile VCT was offered as part of World AIDS Day in December 2005 in the same area as the outreach. The availability of free HIV and syphilis testing was announced in the outreach area, and interested street-based sex workers were invited to be tested. Group education regarding HIV was followed by individual written informed consent for HIV testing according to national standard procedures. Data collection was limited to age and whether or not the individual had engaged in street-based sex work in the last 3 months. Phlebotomy was performed and samples were sent to the laboratory for HIV and syphilis testing. Test results were provided at the STI clinics after two weeks along with other routine STI services according to standard practices; transportation costs were reimbursed.

Laboratory testing

Serum was tested for HIV antibodies using routine procedures at the clinics following Thai national guidelines. A positive anti-HIV enzyme-linked immunosorbent assay (ELISA) test was considered a positive test result if confirmed by a second positive ELISA using a different antigen or by an assay using the particle agglutination principle. Syphilis serology testing was done in local MOPH laboratories using a Rapid Plasma Reagin (RPR, Human Diagnostics, Wiesbaden, Germany) as a screening test and the *Treponema pallidum* hemagglutination assay (TPHA; Fuji-rebio, Japan) was used as a confirmatory test.

This project was approved by the Thai MOPH and the US Centers for Disease Control and Prevention (CDC) as a programmatic activity not requiring approval from an Institutional Review Board.

Statistical analysis

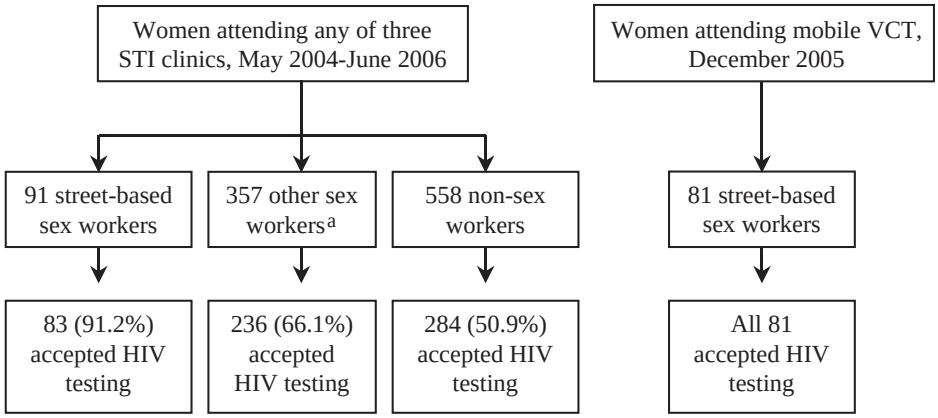
Data were entered into a Microsoft Access database. Laboratory data were entered twice to ensure accuracy; data in the two entry tables were compared and only validated records were consolidated into a master table. Data were analyzed and statistical tests performed using Statistical Package for Social Sciences (SPSS) for Windows, version 12 software (SPSS Inc, Chicago, IL.). Chi-squared tests were used to test for differences in proportions. Logistic regression was used to calculate odds ratios (OR) and 95% confidence intervals (CI). Multiple logistic regression was used to identify risk factors associated with HIV infection and reactive syphilis serology. The final choice for the model was based on backward stepwise regression; risk factors from bivariate analysis with p-values <0.2 were included in the initial models. Continuous variables were dichotomized at median levels for inclusion in the model.

Analysis of mobile VCT data was limited to infection prevalence by sex worker type, as no other demographic or behavioral data were collected. Multiple logistic regression using clinic data was limited to sex workers to allow inclusion of behavioral factors related to sex work.

RESULTS

Clinic population

From May 2004 to June 2006, a total of 1,006 women attended the three public



[a]Other sex workers include those working brothels and entertainment venues

Fig 1–Acceptance of HIV testing among women attending STI clinics and mobile VCT in Bangkok, Thailand.

STI clinics (Fig 1). HIV testing at the clinics was carried out in 83 of 91 (91.2%) street-based sex workers, 236 of 357 (66.1%) other sex workers (brothel-based, entertainment venue-based, and others), and 284 of 558 (50.9%) other women who did not report sex work. All women who had an HIV test at the STI clinic returned to the clinic to learn their test results.

The demographics and risk behavior characteristics are shown in Table 1. The street-based sex workers were older than the other sex workers and non-sex workers (median age 36 years *vs* 26 years *vs* 32 years; $p<0.001$) (Table 1). About half the sex workers were born in northeastern Thailand, and nearly half the non-sex workers were born in central Thailand.

A higher proportion of sex workers compared to non-sex workers reported having had casual sex partners (not including paying partners) during the last 3 months (78.8% *vs* 6.5%; $p<0.001$). Of those with casual partners, sex workers had a higher number of casual partners [median 15 (range 1-168) *vs* median 1 (range 1-6), $p<0.001$], and a higher proportion of sex workers reported condom use during last sex with a casual partner (89.2% *vs* 29.4%; $p<0.001$). A history of drug use was more often reported by street-based sex workers compared to other sex workers and non-sex workers (39.8% *vs* 26.7% *vs* 15.1%; $p<0.001$).

Compared to other sex workers, street-based sex workers were older (median age 36 years *vs* 26 years; $p<0.001$), were engaged in sex work longer (median 5 years *vs* <1 year; $p<0.001$), and had more clients per week (median 10 *vs* 5; $p<0.001$) (Table 1). Consistent condom use with clients during the last three months was reported by 85.9% of street-based sex workers and by 93.9% of other sex workers ($p=0.04$) (Table 1); the proportion reporting condom use was similar among those with positive HIV and negative HIV test screening results (88.1% *vs* 90.4 %; $p=0.6$).

Mobile VCT population

During the December 2005 mobile VCT event, 81 street-based sex workers were tested for HIV and syphilis (Fig 1). The median age was 35 years old (IQR 27-44 years old).

Table 1
Characteristics of 603 women receiving HIV testing at any of three public STI clinics in Bangkok, Thailand.

Characteristics	Street-based sex workers (*n*=83) *n*/*N* (%)	Other sex workers (*n*=236) *n*/*N* (%)	Non-sex workers (*n*=284) *n*/*N* (%)	*p*-value
Demographics				
Median age, years (IQR)	36 (27-48)	26 (21-33)	32 (26-40)	<0.001
Place of birth				0.016
Northern Thailand	14/83 (16.9)	40/232 (17.2)	36/279 (12.9)	
Central Thailand	29/83 (34.9)	69/232 (29.7)	128/279 (45.9)	
Southern Thailand	2/83 (2.4)	5/232 (2.2)	3/279 (1.1)	
Northeastern Thailand	35/83 (42.2)	116/232 (50.0)	106/279 (38.0)	
Outside Thailand	3/83 (2.4)	2/232 (0.9)	6/279 (2.2)	
Completed primary school or less	72/83 (86.7)	103/229 (45.0)	169/280 (60.4)	<0.001
Behavior				
Steady partner	56/83 (67.5)	164/230 (71.3)	240/280 (85.7)	<0.001
Condom use last sex	21/53 (39.6)	70/161 (43.5)	46/234 (19.7)	<0.001
Casual partner in last 3 months	59/81 (72.8)	186/230 (80.9)	18/278 (6.5)	<0.001
Number of casual partners in the last 3 months; median (range)	10 (1-150)	20 (1-168)	1 (1-6)	<0.001
Condom use last sex	52/59 (88.1)	130/145 (89.7)	5/17 (29.4)	<0.001
Sex work				
Median age started, years (range)	26 (11-57)	24 (13-50)	NA	0.06
Median duration, years (range)	5 (0-30)	0 (0-20)	NA	<0.001
Median number of clients past week (range)	10 (1-100)	5 (1-60)	NA	<0.001
Consistent condom use in last 3 months	61/71 (85.9)	155/165 (93.9)	NA	0.04
History of injecting drug use	33/83 (39.8)	63/236 (26.7)	43/284 (15.1)	<0.001
Laboratory				
Positive HIV test	38/83 (45.8)	10/236 (4.2)	28/284 (9.9)	<0.001
Reactive syphilis serology	11/83 (13.3)	5/234 (2.1)	7/272* (2.6)	<0.001

NA, not applicable
Denominators vary due to missing data.

HIV infection and syphilis

The HIV prevalences among women attending the clinic were 45.8% for street-based sex workers, 4.2% for other sex workers and 9.9% (28/284) for non-sex workers (p<0.001) (Table 1). Street-based sex workers who had mobile VCT had an HIV prevalence of 21.0% (17/81).

The syphilis seroprevalence among women attending the clinic was 13.3% for street-based sex workers, 2.1% for other sex workers and 2.6% among women not reporting sex work (p<0.001) (Table 1). Two women, both HIV negative and not sex workers, had syphilis titers of 1:8 or higher. The syphilis prevalence among street-

Table 2
Factors associated with HIV infection among 319 sex workers tested at any of three public STI clinics in Bangkok, Thailand.

Factors	HIV infection *n*/*N* (%)	OR (95% CI)	Adjusted OR (95% CI) in final model[a]
Type of sex worker			
Street-based sex worker	38/83 (45.8)	19.1 (8.9-41.1)	17.9 (7.3-43.9)
Other sex worker	10/236 (4.2)	1	1
p-value		<0.001	<0.001
Age group			
≥30 years	28/128 (21.9)	2.4 (1.3-4.5)	-
<30 years	20/191 (10.5)	1	-
p-value		0.006	-
Education completed			
Primary school or less	41/175 (23.4)	5.7 (2.5-13.1)	-
Secondary school or more	7/137 (5.1)	1	-
p-value		<0.001	-
Steady partner in last 3 months			
No	13/93 (14.0)	1	-
Yes	34/220 (15.5)	1.1 (0.6-2.2)	-
p-value		0.7	-
Casual partner in last 3 months			
Yes	32/245 (13.1)	0.6 (0.3-1.2)	-
No	13/66 (19.7)	1	-
p-value		0.2	-
History of injecting drug use			
Yes	19/96 (19.8)	1.7 (0.9-3.1)	-
No	29/223 (13.0)	1	-
p-value		0.1	-
Age started sex work			
≥25 years	23/157 (14.6)	1.0 (0.5-1.9)	-
<25 years	22/151 (14.6)	1	-
p-value		1	-
Duration of sex work			
≥1 years	40/180 (22.2)	7.0 (2.7-18.4)	3.4 (1.1-11.3)
<1 years	5/128 (3.9)	1	1
p-value		<0.001	0.03
Number of clients last week			
≥6 clients	23/125 (18.4)	1.5 (0.7-3.0)	-
<6 clients	15/113 (13.3)	1	-
p-value		0.3	-
Condom use last client			
No	5/27 (18.5)	1.3 (0.5-3.6)	-
Yes	37/243 (15.2)	1	-
p-value		0.7	-
Syphilis serology			
Reactive	6/16 (37.5)	3.8 (1.3-11.0)	-
Non-reactive	41/301 (13.6)	1	-
p-value		0.01	-

OR, odds ratio; CI, confidence interval. Denominators vary due to missing data.
[a] Initial model included type of sex worker, age group, education, casual partner in last 3 months, history of injecting drug use, duration of sex work, and syphilis serology. Non-significant factors were eliminated in the final model.

based sex workers accepting mobile VCT was 3.7% (3/81).

All 83 street-based sex workers who had HIV testing at the clinic returned to learn their HIV test results. Only 12 (14.8%) of the street-based sex workers tested by mobile VCT visited the clinic to receive their test results.

Risk factors for HIV infection among sex workers

The risk factors for HIV infection among the 319 sex workers tested at the clinics are shown in Table 2. On multivariate analysis only street-based sex work (adjusted OR 17.9) and duration of sex work of one year or longer (adjusted OR 3.4) remained associated with higher risk for HIV infection.

Risk factors for reactive syphilis serology among sex workers

On bivariate analysis, factors associated with reactive syphilis serology for 317 sex workers tested at the clinics were age ≥ 30 years (OR 11.3), completion of primary school or less (OR 5.9), no steady partner in the past 3 months (OR 2.9), duration of sex work of one year or longer (OR 4.9), and positive HIV serology (OR 3.8). No other demographic or behavioral factors were significantly associated with reactive syphilis serology (data not shown). On multivariate analysis, only street-based sex work (adjusted OR 3.9) and age ≥ 30 years (adjusted OR 7.1) remained significantly associated with reactive syphilis serology.

DISCUSSION

This is the first published report showing a high HIV prevalence among street-based sex workers in Bangkok. Other sex workers attending the STI clinics had an HIV prevalence similar to that reported with routine surveillance. Studies in other countries have also documented higher HIV prevalences among street-based sex workers than among other sex workers (Dandona *et al*, 2005; Todd *et al*, 2006). Similarly, a survey in Bangkok found a higher HIV prevalence among male sex workers soliciting clients on the streets compared to those working in establishments (van Griensven *et al*, 2006a).

Factors that could create a higher risk for HIV infection among street-based sex workers include a higher number of clients, higher-risk clients, or limited access to prevention tools, such as condoms and STI treatment. Street-based sex workers in our project were engaged in sex work for a longer period and reported more clients than other sex workers, providing more potential exposure to HIV. Though not mandated by government policy, many establishments monitor sex workers' HIV status, requiring periodic in-house testing or documentation of HIV-negative status in order to maintain employment (Guest *et al*, 2007). Sex workers may resort to soliciting clients on the street–a lower paying type of work–once they have become HIV-infected. Although we do not have specific data on why sex workers in this study were working on the streets, their longer duration of sex work could reflect a move to the streets after acquiring HIV while working in an establishment.

HIV prevalence measured among sex workers who had a history of injecting drug use was higher than among sex workers with no history of injecting drug use but this difference did not reach statistical significance. This may reflect the modest sample size of injecting drug users in this study, as well as the declining HIV prevalence among injecting drug users in Bangkok; from 53.7% in 2001 (UNAIDS,

2004) to 28.8% in 2007 (UNAIDS, 2008). In addition, we did not distinguish between current and former injecting drug use; further data regarding current drug use would be helpful in designing appropriate linkages to drug treatment programs.

Street-based sex workers who choose to be tested for HIV may not be representative of all street-based sex workers. The provision of free CD4 tests and HIV care referrals in our project may have motivated those with HIV-related symptoms to be tested. Under the universal health coverage scheme in Thailand, persons who test HIV-positive are referred from the counseling and testing unit to HIV care and treatment services.

The HIV positivity rate at an anonymous VCT clinic in Bangkok, serving a broad population and also providing referral and care, was similarly high at 17.5% (Khongphatthanayothin *et al*, 2006). A survey using a method appropriate for hidden populations, such as respondent-driven sampling, could provide reliable HIV prevalence estimates for sex workers, including those soliciting clients on the streets and in venues other than brothels. A recent respondent-driven sampling survey of female sex workers in Bangkok (Manopaiboon *et al*, 2008) showed non-venue-based sex workers had a 20% HIV prevalence, which is clearly much higher than the 2.5% reported by sentinel surveillance (Bangkok Metropolitan Administration, 2007).

The HIV prevalence among women who did not report sex work was higher than that for some sex workers. These women might be engaged in sex work but were unwilling to disclose that information, might have other undisclosed behavioral risks for HIV or might have a partner at high risk or known to be HIV-infected. STI clinic attendance indicates self-identification of risk for STI; It is important to continue providing HIV prevention, testing and care services to this population.

It is important to increase access to VCT for street-based sex workers identified as a population with a high HIV prevalence. Knowledge of HIV status provides an opportunity for HIV-infected persons to receive antiretroviral treatment, now widely available in Thailand, and to take measures to protect others from contracting HIV infection. Although all street-based sex workers tested at the clinics returned for test results, few sex workers receiving mobile VCT did so. This may be due to street-based sex workers who accessed HIV testing at the clinic intended to learn their HIV status and were more likely to take good care of their health, whereas sex workers receiving mobile VCT did not intend to learn their HIV status but were invited to be tested. Cost for transportation to health facilities and the time consuming process might be barriers for returning for test results. Rapid HIV testing with same day test results is needed for future mobile VCT as efforts to scale up access to HIV testing.

Reactive syphilis serology was common among street-based sex workers, potentially reflecting duration of sex work and thus potential exposure to infection. Street-based sex workers may have limited access to STI services and thus be less likely than other sex workers to have received previous screening and treatment for syphilis, as was recently observed in the United Kingdom (Jeal and Salisbury, 2007). Syphilis seroprevalence among other sex workers was comparable to the prevalence found during national surveillance. Reactive syphilis serology was more common in women testing positive than

testing negative for HIV infection. Although false positive syphilis serology can occur in HIV infection, most positive syphilis serologies reflect true infection and treatment is particularly important as the risk for neurosyphilis is increased among HIV-infected persons (Musher *et al*, 1990). Syphilis has been associated with decreased CD4 cell counts and increased HIV viral load; both improve after treatment of syphilis (Kofoed *et al*, 2006).

Both groups of sex workers had high rates of reported condom use, although lower than the target of 100% condom use. Reported condom use may be higher than actual use due to social desirability bias, a phenomenon which has been observed previously in Thailand (van Griensven *et al*, 2006b). A recent anonymous survey in Thailand reported overall condom use to be in 50% of sex acts among sex workers (Buckingham *et al*, 2005).

A lower proportion of street-based sex workers reported consistent condom use with their clients than other sex workers. Sex workers may choose to receive increased payment for not using condoms, as has been shown in Thailand (Buckingham *et al*, 2005) and elsewhere (Bucardo *et al*, 2004; Ntumbanzondo *et al* 2006). HIV-infected sex workers no longer have the motivation of self-protection from HIV to use condoms, and those working on the streets lack the reinforcement provided by establishments to use condoms. The needs of street-based sex workers, especially those infected with HIV, should be addressed by prevention and care programs.

Our findings show a high HIV prevalence among street-based sex workers in Bangkok. Street-based sex workers should be systematically included in routine surveillance to measure both the extent of HIV in the population and associated behaviors and contextual information that could inform program planning. The Bangkok Metropolitan Administration is exploring strategies to increase access to HIV testing, care and prevention for this vulnerable group.

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