GLOBAL VIEW

Rural sex work in Cambodia: work characteristics, risk behaviours, HIV, and syphilis

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Objective: To identify prevalence and risks factors for syphilis and HIV among rural female sex workers (FSWs) in Cambodia and to describe differences between rural and urban FSWs.

Methods: Interviews and sera were collected from 114 FSWs and tested for HIV using the Serodia-HIV test and positives confirmed with the enzyme linked immunosorbent assay. Syphilis was tested for with the rapid plasma reagin with passive particle agglutination test for detection of antibody of *Treponema pallidum*. Study data were merged with data from a study of urban FSWs from Phnom Penh that applied similar questionnaires and sampling design to compare STI prevalence and behaviours.

Results: 42% of rural FSWs were HIV positive; 22% had past or current syphilis. In multivariate models HIV was significantly associated with age ⩾25 (OR = 6.1 95% CI: 1.0 to 36.6), a non-commercial partner in the past year (OR= 0.33, 95% CI: 0.11 to 0.93), and prevalence of past or current syphilis (OR = 2.9, 95% CI: 1.0 to 8.8). There was significantly higher active syphilis (14% *v* 4%), older mean age (25 *v* 21), fewer daily clients (2 *v* 5), lower monthly income ($61 *v* $174), and longer duration of sex work (2.3 years *v* 1.4 years) among rural than among urban FSWs.

Conclusions: These findings reveal a high burden of HIV and syphilis among FSWs in rural Cambodia. As FSWs age and become infected with STI/HIV they may move out of cities into less competitive but less savvy markets; their high mobility may contribute to the expansion of the HIV epidemic into rural Cambodia and lower risk populations.

The HIV Sentinel Surveillance (HSS) of Cambodia's National Center for HIV/AIDS, Dermatology and STDs (NCHADS) in 2000 reported HIV rates reflecting a generalised epidemic: 31% of "direct" female sex workers (DFSWs), 16% of "indirect" female sex workers (IDFSWs), and 2.3% of women receiving antenatal care tested positive for HIV.[1] The estimated prevalence for syphilis was 4%–25% among DFSWs in cities and border provinces in 1996.[2] Heterosexual intercourse is the predominant mode of transmission for sexually transmitted infections (STI) including HIV and these epidemics are largely attributed to a local sex industry that is both large (55 000 FSWs estimated in 2001[3]) and low cost ($2–$4 per brothel sexual encounter).[4] STI/HIV control in Cambodia is concentrated in cities even though 85% of the population are rural.[5] To identify factors contributing to the generalisation of Cambodia's HIV epidemic into rural populations, identify prevalence and risks factors for syphilis and HIV among rural FSWs, and differences between rural and urban FSWs, a study was conducted of FSWs in Kampong Chnnang province where less than 15% of people live in the provincial capital.[6]

METHODS

All FSWs in provincial sex establishments (23 brothels and six karaoke bars in three districts) were listed (a complete census) and 114 of the 126 FSWs agreed to participate. In December 2000 FSWs were interviewed by female staff using a sexual behaviour questionnaire; then 5 ml of blood was drawn and a unique code number assigned. HIV was tested with Serodia-HIV and positives confirmed by enzyme linked immunosorbent assay (GENSCREEN-HIV1/2 version 2, Sanofi Pasteur). Syphilis was tested for using rapid plasma reagin (RPR) and passive particle agglutination test for detection of antibody of *Treponema pallidum* (TPPA, Fujirebio, Japan). Subjects testing positive for both RPR and TPPA indicated active syphilis; those positive for TPPA alone were considered having past or current syphilis infection. Those positive on both RPR and TPPA were treated following the national STI guidelines.[7] Subjects were not provided with HIV test results in accordance with the national policy on HIV research.

The study data from 71 DFSWs were merged with data from Phnom Penh from an urban STI prevalence survey conducted the following month (January 2001). Study questionnaires and data collection were designed to be similar to the larger STI survey to allow for combining the data to compare differences between rural and urban FSWs; blood samples from the STI survey were only tested for active syphilis.

The study was approved by the human subjects review board, University of Washington and the Ministry of Health of Cambodia. Data were entered twice in Epi-Info; Stata (Stata Corporation, TX, USA) was used for statistical analysis, associations between HIV/STI and behavioural factors were assessed bivariately using Student's *t* test and χ^2 test/Fisher's exact test. Unadjusted odd ratios (OR) and 95% confidence intervals (CI) were calculated using univariate logistic regression and a multiple logistic regression for adjusted ORs.

RESULTS

Overall, 42% of rural FSWs tested positive for HIV and 22% for past or current syphilis (table 1). Of the 114 sex workers 71 were brothel based and 43 were karaoke or bar based, their mean age was 24 years, less than 20% had secondary education, and their mean monthly income was $60. In univariate logistic regression having a non-commercial partner (sweetheart) in the past year and age at first commercial sex were associated with HIV. FSWs who worked longer in the brothels were more likely to report always using condoms than FSWs who worked less (12 months *v* 6 months, p=0.05). FSWs with sweethearts were less likely to be HIV positive but more likely to be younger (23.9 *v* 25.2), newer to the brothels (5.5 months *v* 9.6 months, p=0.03), and working in karaoke bars (64.3% *v* 39.4%, p=0.01) than FSWs without sweethearts. In multivariate logistic regression current age (age ⩾25, OR= 6.1 95% CI: 1.0 to 36.6), having a non-commercial partner in the past year (OR = 0.33, 95% CI: 0.11 to 0.93), and being TPPA positive (OR=2.9, 95% CI: 1.0 to 8.8) were independently associated with HIV.

Table 1 Univariate logistic regression between HIV seroprevalence and risk factors among all female sex workers (FSWs) in Kampong Chnnang, Cambodia

	FSWs (n=114)	HIV+ (%)	OR*	95% CI†
Current age (years)				
⩽18	14	21	1	
19–24	54	39	2.33	0.58 to 9.35
⩾25	46	52	4.00	0.98 to 16.24
Education level‡				
Primary school	96	39	1	
Secondary school	18	61	2.50	0.89 to 7.03
Monthly income				
⩽ 200 000 riels	62	40	1	
> 200 000 riels	52	44	1.17	0.55 to 2.47
Number of clients in the last day				
⩽ 2 clients	91	44	1	
> 2 clients	20	40	0.85	0.31 to 2.27
Time in current brothels/karaoke establishments				
⩽ 3 months	56	41	1	
4–6 months	12	67	2.86	0.77 to 10.66
⩾ 6 months	36	39	0.91	0.38 to 2.14
Condom use with clients				
Always	80	49	1	
Not always	19	32	0.48	0.17 to 1.40
Reported past year sweetheart				
No	58	52	1	
Yes	55	33	0.45	0.21 to 0.97
Previous places of sex work				
Other cities/provinces	35	43	1.0	
Kampong Chnnang	77	43	1.0	0.44 to 2.24
Ethnic group				
Cambodian	74	41	1	
Others§	39	46	1.25	0.57 to 2.74
Age at first commercial sex				
⩽18	29	24	1	
19–24	45	44	2.51	0.89- 7.10
⩾25	35	57	4.19	1.42- 12.36
Type of work				
IDFSWs (karaoke)	43	35	1	
DFSWs (brothel)	71	47	1.62	0.74 to 3.54
TPPA				
Negative	89	38	1	
Positive	25	56	2.05	0.83 to 5.05
RPR and TPPA positive				
Negative	100	40	1	
Positive	14	57	2.00	0.64 to 6.20

*Unadjusted odd ratio; †95% confidence interval; ‡Primary = less than or equal 5 years, secondary = more than 5 years; §Including Vietnamese, Cham, and Kampuchea Krom.

Significantly more of the 71 DFSWs from Kampong Chnnang tested positive for syphilis than the 150 DFSWs from Phnom Penh (14.1% *v* 4%, p=0.007) (table 2). The following were significantly different between rural and urban FSWs: current age (24.7 *v* 21.3, p<0.001), age at first commercial sex (22.4 *v* 20, p<0.001), number of daily clients (1.6 *v* 5.1, p<0.001), monthly income ($61.4 *v* $174.3, p<0.001), and duration of sex work (2.3 years *v* 1.4 years, p=0.004). For illustrative purposes HIV prevalence was compared from Cambodia's 2000 HSS; HIV prevalence among FSWs in Kampong Chnnang was nearly twice as high as among FSWs in Phnom Penh.

DISCUSSION

In a rural province of a country with a generalised HIV epidemic FSWs were found to have a high burden of disease and an epidemiology divergent from expected patterns. Unlike Vietnam,[8] FSWs reporting non-commercial partners (sweetheart) in the past year were less likely to be HIV positive than those without such partners, even though few used condoms with these partners. Because FSWs with such partners were younger and newer at sex work, their lower HIV prevalence was more likely to be the result of a shorter duration of exposure than their current behaviour. Also unexpected was that the number of daily clients was not associated with HIV, perhaps because few rural FSWs reported high numbers of daily clients or HIV positive FSWs could have previously had more daily partners at the time of infection. Finally, reported condom use was not associated with HIV/STI. Given that rural FSWs newer to sex work used condoms less than more experienced FSWs, those currently reporting consistent use may have become infected with HIV earlier in their sex career before adopting consistent use. This suggests condom counselling should target new FSWs.

Rural FSWs were twice as likely to be HIV positive and were older than urban FSWs, suggesting that after working in cities, FSWs may move to the provinces and be replaced by younger and less experienced FSWs. Indonesian FSWs working in cities or towns reported returning to their home after retiring from sex work.[9] Although there is a greater demand for commercial sex in Cambodian cities (urban FSWs report more daily clients than rural FSWs, a higher monthly income, and in a household survey more urban than rural males reported accessing commercial sex in the past year[10]) older FSWs may be outcompeted. In the 1999 BSS 70% of urban

Table 2 HIV and syphilis prevalence, and risk behaviour among rural sex workers in Kampong Chnnang province and urban sex workers in Phnom Penh, Cambodia

	Kampong Chnnang		Phnom Penh		
	No (%)	Mean	No (%)	Mean	p Value*
Current age	71	25 years	150	21 years	0.0001
Age at first sex	71	18 years	150	19 years	0.45
Age at first commercial sex	71	22 years	150	20 years	0.0001
Number of clients per day	71	2	149	5	0.0001
Monthly income	71	$61	148	$174	0.0001
Cost per client	71	$2	48	$2	0.14
Duration of sex work†	71	2 years	150	1 year	0.004
Brothel size	68	7	138	6	0.35
Consistent condom use					
With client	68 (79)		150 (67)		0.07
With regular clients	33 (76)		108 (71)		0.62
With sweetheart‡	18 (61)		58 (54)		0.56
Active syphilis (RPR/TPPA+)	71 (14)		150 (4)		0.007
HIV positive§	71 (47)		152 (26)		NA

*Significant level at p⩽0.05.
†Duration was calculated by using current age minus age at first commercial sex.
‡In Kampong Chhnang, the condom use with sweethearts was asked in past week, while in Phnom Penh it was asked in past month.
§The HIV data in Phnom Penh were taken from the report on HIV Sentinel Surveillance in Cambodia, 2000, National Center for HIV/AIDS, Dermatology and STDs, Ministry of Health.

Key messages

- High HIV and syphilis prevalence are reported among brothel based sex workers in one rural province in Cambodia, the country with Asia's fastest growing and now generalised HIV epidemic
- Differences in behaviour and morbidity between types of sex workers (direct versus indirect) within a rural setting are compared—few differences are found suggesting fluidity of sex work between establishments within provinces
- Sexually transmitted diseases and behavioural patterns are compared between these rural sex workers and sex workers in a large city—differences in age and duration of sex work suggest movement of sex workers out of cities to rural provinces as their careers evolve

FSWs reported being in the city less than one year,[4] yet there are no data on where they go after leaving their jobs.

The high prevalence of disease and risky behaviour among these rural sex workers suggests continuing transmission of HIV outside of the cities into rural areas. The spread of the HIV epidemic in Cambodia has been largely attributed to mobility of male clients who act as sexual bridges by having sex with both FSWs and their wives.[11] These findings suggest the mobility of FSWs is also important. Sex workers may begin their careers in major cities then relocate to rural provinces after becoming infected with STIs, including HIV. Smaller rural sex markets may pose a greater challenge for sex work to be lucrative, possibly resulting in FSWs to be less likely to insist on condom use by clients that are fewer and less savvy about HIV than urban clients. Approaches to reducing HIV incidence effective globally such as STI detection and treatment, voluntary HIV testing and counselling, and condom promotion have been greatly expanded in Cambodia in urban settings; however, they are also needed in rural areas. HIV prevention programmes have been successfully directed at rural general populations in developing countries (Mwanza study),[12] and these findings suggest HIV prevention programmes should consider targeting rural sex workers to control further generalisation of STI/HIV epidemics.

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CONTRIBUTORS

HS designed the data collection instruments, field methods, analysis plan, supervised the fieldwork, and undertook most of the writing; PMG participated in all aspects of the design, analysis, and writing; SG and HBL provided guidance in study design and writing of the manuscript.

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