

# HIV and other sexually transmitted infections in women with illegal social behavior in Isfahan, Iran

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## Abstract

**Background:** Little is known about sexually transmitted infections (STIs) among females who engage in illegal sexual behavior in Iran. So, this study was conducted to obtain knowledge about the prevalence and associated risk factors in this population.

**Materials and Methods:** In a cross-sectional study, a total of 100 women who had exchange of sex for money in previous 3 months according to self report were recruited during 2009–2010 by simple non probable sampling method in Isfahan, Iran. HIV-Ab, *Chlamydia trachomatis*-IgG and syphilis infection were measured. A questionnaire on demographics and prostitution-associated risk data was collected as well. Chi-square and multivariate logistic regression models were used for data analysis.

**Results:** Of 100 participants, the samples of 91 ones could be tested for STI markers (nine samples were hemolysis or insufficient). The overall prevalence of *C. trachomatis* was 19.8%. There was no case with syphilis or HIV infection. Multiple logistic regression analysis demonstrated that participants who reported temporarily marriage were less likely to be infected with *C. trachomatis* (AOR=0.003, 95%CI=0.001–0.58). The other risk factors for the tested STIs were not statistically significant in multiple logistic regressions.

**Conclusion:** The results of our study indicated that seroprevalence and associated risk factors of HIV and other STIs among female with illegal social behaviors is not considerable in Isfahan, Iran.

**Key Words:** Chlamydia, HIV, illegal social behaviors, syphilis, women

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## INTRODUCTION

Sexually transmitted infections (STIs) are among

major causes of mortality in developing countries that occur most commonly in those with multiple sex partners.<sup>[1]</sup> It is estimated that 340 million new cases of STIs occur globally in 15–49 year age group each year.<sup>[2]</sup>

Some people carry the infection for long period and during this time; an infected individual can spread the disease. Complications of STIs include inflammation of pelvic and cervix in women, inflammation of urethra and prostate in men, and fertility and reproductive system problems in both sexes. Also, infants may be

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infected in the womb or during birth with possible consequences include still birth, blindness, and permanent neurological damage.<sup>[3]</sup>

Womanhood and high number of sexual partners in addition of high rates of risk behavior accelerates sexually transmitted infections among female with illegal social activities.

These women have also traditionally been considered as an important source of transmission of STIs to their sexual partners.<sup>[4]</sup> The prevalence of STIs in high-risk groups can vary depending on the geographic origin, and in prostitutes there are different rates in the world.<sup>[5,6]</sup> Little is known about HIV, cyphilis, and *Chlamydia trachomatis* STIs in Iran among female with illegal social behaviors. So, in order to obtain knowledge of the prevalence of STIs associated risk factors determine the demographic and other characteristics of these females on whom this study was conducted.

## MATERIALS AND METHODS

This cross-sectional quantitative study was conducted in Isfahan between December 2009 and September 2010, a densely populated province in center area of Iran.

A total of 100 women selling sex were recruited by a simple nonprobable sampling method. The cases were from prison, an existing drop in center (DIC) for women and their friends by a snowball sampling method. Eligible criteria were exchange of sex for money in previous 3 months according to a self-report.

The women received detailed information about study aims and procedures, and those who agreed to participate signed a written informed consent form and were enrolled. The enrollees reported age, time in sex work, condom use, number of clients per week, history of vaginitis, drug use behavior, intravenous

drug injection, sex-related behavior, frequency, and type of marriage.

Information was collected by a trained female social worker in private rooms via structured questionnaire anonymously and enrollees could skip any question. The face and content validity of the questionnaire were confirmed by 10 experts and its reliability by alpha cronbach = 0.78.

Samples of blood measuring 10cc were taken to test Chlamydia, HIV, and Syphilis infection. *C. trachomatis* IgG screening was performed by the enzyme-linked immunosorbent assay (ELISA: Euro immune Kit, Italy). Evidence of syphilis infection was determined by rapid plasma reagin (RPR: ENISON, Iran) and HIV-Ab by ELISA: Diapro, Italy.

This project has been approved by the ethic committee of vice chancellor in Isfahan University of Medical Sciences.

## Statistical analysis

Data from questionnaire and Laboratory tests were entered into SPSS-15 for windows (Inc, Chicago, IL) for analysis. Prevalence of STIs was estimated using descriptive statistical methods. Chi-square test was used to assess bivariate associations between risk factors and STIs.

Multiple logistic regressions were used to evaluate adjusted odds ratio for risk factors associated with infections. *P* value  $\leq 0.05$  was considered as statistically significant.

## RESULTS

Of the 100 participants, the blood samples of 91 ones could be tested for STI markers (nine samples were hemolysis or insufficient).

The mean age of enrolls was  $30.84 \pm 9.34$  years. They

**Table 2: Risk estimating for *Chlamydia trachomatis* (n=91)**

Risk factor	Non adjusted OR (95%CI)	Adjusted OR (95%CI)
Age (year)	0.99 (0.93–1.04)	1.13 (0.88–1.45)
Education <sup>a</sup>	2.04 (0.37–11.07)	182.42 (0.48–67998.51)
Time of marriage	1.51 (0.61–3.71)	19.94 (0.77–511.33)
Temporary marriage history <sup>b</sup>	2.4 (0.74–7.78)	0.003 (0.001–0.58)*
Drug addiction <sup>b</sup>	2.65 (0.77–9.04)	6.67 (0.32–135.95)
Time in sex work (month)	1.005 (0.98–1.02)	0.99 (0.93–1.04)
Using condom <sup>c</sup>	4.27 (0.79–22.92)	206.31 (0.57–74105.91)
Oral sex <sup>b</sup>	0.82 (0.23–2.91)	1.77 (0.03–103.73)
Anal sex <sup>b</sup>	0.85 (0.26–2.8)	2.65 (0.01–391.68)

<sup>a</sup>University education = 0 (reference category), other levels=1, <sup>b</sup>No=0, Yes= 1 (reference category=0), <sup>c</sup>yes=0, No=1(reference category=0),

\*Statistically significant (*P*<0.05)

**Table 1: Main characteristics of participants who answered question**

Variable		Number	Percent
Education (n=61)	None or primary	15	24.6
	Secondary	16	26.2
	Diploma	19	31.1
	University	11	18
Ethnicity (n=79)	Iranian	78	98.7
	Afghan	1	1.3
Frequency of permanent marriage (n=61)	0	11	18
	1	38	62.3
	2	11	18
	3	1	1.6
Number of client per week (n=62)	1-2	16	25.8
	3-4	28	45.2
	≥ 5	18	29

had worked in the sex industry for  $36 \pm 28.5$  months on average.

The main characteristics of the sample are reported in Table 1. Among the participants who answered the questions, 54.2% had history of temporarily marriage, 74% had more than three clients per week, 67.5% had history of university 61.3% had taken some type of illegal drug whose 24.1% reported to have injected drugs and 36.3% had prison history.

60.3% of the women had used condom during sexual intercourse with clients. Anal sex, vaginal sex, and oral sex reported in 27.6%, 96.1%, and 34.2%, respectively.

The overall prevalence of *C. trachomatis* was 19.8%. There was no case with syphilis-RPR positive or HIV infection.

Of 18 sample who were positive for Chlamydia, 13 ones had prison history and 5 had not ( $P = 0.001$ ). Multiple-logistic regression analyses demonstrated that participant who reported temporarily marriage were less likely to be infected with *Chlamydia trachomatis* (AOR=0.003, 95%CI=0.001–0.58). The other risk factors for the tested STIs were not statistically significant in multiple logistic regressions [Table 2].

## DISCUSSION

In this study, *C. trachomatis* was observed in 19.8% of female with illegal social behaviors in Isfahan, Iran.

In Iran, there is no other evidence in this high risk group in recent years. However, in a study in 2005 in Tehran, *C. trachomatis* – IgG positive was reported in 23% of infertile and 12% of fertile women.<sup>[7]</sup>

In another parts of the world, there are different findings in this population. In a study in Tunisia in 2010, *C. trachomatis* was detected in 72.9% of female prostitutes who enrolled at their weekly medical visit.<sup>[8]</sup>

In Madagascar, 7% of hidden female sex workers were infected with *C. trachomatis*.<sup>[9]</sup> In New Guinea, the overall estimated rates for Chlamydia in female sex workers were 19%.<sup>[10]</sup>

In this study, there was no one with syphilis or HIV infection. It is known that the presence of an STI increases the risk of acquisition and transmission of HIV. So, HIV infection rates are expected to be high among female sex workers.<sup>[11]</sup>

However, there are various results in this group in the world. In New Guinea, Madagascar and Mongolia, no HIV infections were found in female sex workers.<sup>[9,10,12]</sup> In Kinshasa, Congo, HIV prevalence was 12.4% among prostitutes.<sup>[13]</sup>

The results of this study suggest that temporarily marriage in this group were closely linked to Chlamydia infection decreasing. Temporarily marriage with probable fewer clients in a period of the time can be the cause of this correlation.

Our study results reveal minimal correlation with known behavior factors such as duration of sex work, number of commercial clients, and using the condom.

## CONCLUSION

The results of our study indicated that seroprevalence of HIV and other STIs among female with illegal social behaviors is not considerable in Isfahan, Iran.

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