Sexually transmissible infections among female sex workers: an international review with an emphasis on hard-to-access populations

Julie G. Cwikel, Tal Lazer, Fernanda Press and Simcha Lazer

The Center for Women's Health Studies and Promotion, Ben-Gurion University of the Negev, Beer-Sheva 84105, Israel.
Department of Obstetric and Gynecology, Soroka University Medical Center, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva 84105, Israel.
Women's Health Center, Clalit Medical Services, Beer-Sheva 84105, Israel.
Corresponding author. Email: jcwikel@bgu.ac.il

Abstract. Background: Women who work commercially in sex work (female sex workers [FSW]) are considered a high-risk group for sexually transmissible infections (STI), yet the level of reported pathogens varies in studies around the world. This study reviewed STI rates reported in 42 studies of FSW around the world published between 1995 and 2006 and analysed the trends and types of populations surveyed, emphasising difficult to access FSW populations.

Methods: Studies were retrieved by PUBMED and other search engines and were included if two or more pathogens were studied and valid laboratory methods were reported. Results: The five most commonly assessed pathogens were Neisseria gonorrhoea (prevalence 0.5–41.3), Chlamydia trachomatis (0.61–46.2), Treponema pallidum (syphilis; 1.5–60.5), HIV (0–76.6), and Trichomonas vaginalis (trichomiasis; 0.11–51.0). Neisseria gonorrhoea and C. trachomatis were the most commonly tested pathogens and high prevalence levels were found in diverse areas of the world. HIV was highly prevalent mostly in African countries. Although human papillomavirus infection was surveyed in few studies, prevalence rates were very high and its aetiological role in cervical cancer warrant its inclusion in future FSW monitoring. Hard-to-access FSW groups tended to have higher rates of STI. Conclusions: The five most commonly detected pathogens correspond to those that are highly prevalent in the general population, however there is an urgent need to develop rapid testing diagnostics for all five pathogens to increase prevention and treatment, especially in outreach programs to the most vulnerable groups among FSW.

Introduction

The Global Burden of Disease Report estimated that sexually transmitted infections (STI) are the second most important cause of healthy life lost in women in their reproductive years. STI constitute a major public health threat in both developed and developing countries, with an estimated 340 million incident cases of curable STI. These cases are in addition to the 5 million incident cases of HIV (2002 data) (range 3.6–6.6 million [2006 data]) each year. Prostitutes or commercial female sex workers (FSW) have been viewed both by laypersons and epidemiologists as one of the high-risk groups for infection and transmission of STI. Although FSW are often the target of behaviour change campaigns to mitigate STI, this may oversimplify the complex relationships between host, agent and environment associated with STI transmission. For example, a recent analysis of the global HIV pandemic found that the proportion of FSW among the adult female population was strongly associated with HIV prevalence in a cross-national analysis. Yet this same study also points to female illiteracy rates and income inequality, as well as the proportion of migrant workers being other potent predictors of HIV prevalence, suggesting that the context of commercial sex work affects transmission.

For example, among sub-groups of FSW where there are workplace safeguards to prevent pressure to forego condoms, the infection rate among prostitutes may be low and associated primarily with personal sexual partners where consistent condom use is less common. It is also clear that prostitutes are not a single homogeneous group; the personal circumstances and behaviours of some may increase their risk for both STI and other health problems. Legal residency status, recent immigration and citizens’ rights including access to health care can affect the ability of FSW to negotiate consistent condom use among their clients. For example, prostitutes of foreign origin who had also worked in another country before entry into Australia, were more likely to report inconsistent condom use and thus increase their risk of STI, even when working in an area where prostitution is decriminalised. A similar finding of inconsistent condom use was reported among
the prostitutes who had migrated to the Netherlands from Latin America. 

The two most common STI, *Chlamydia trachomatis* and *Neisseria gonorrhoea*, are often asymptomatic and therefore more likely to go undetected and untreated. Therefore, screening and early treatment for infection is very important in sexually active populations to prevent adverse health effects, particularly among adolescents and those who began sexual activity early as do many women who enter the sex industry before the age of 18. 14–17 In populations where access to health care is problematic, such as among migrant FSW, or where poverty and health inequalities leave many without access to health care, women may not be able to seek care, even in the presence of symptoms. For example, in a study of poor, pregnant Zulu women coming for prenatal care, no woman volunteered abnormal, urogenital symptoms. However, on direct questioning, at least one symptom was elicited from 83% and 80% had more than one symptom. Lower abdominal pain was the most commonly reported and 52% of these women had at least one STI. 18

The risk of STI may increase even more when those working in the sex industry have been trafficked across borders illegally. Based on the United Nations Protocol against Trafficking in Persons, trafficking is characterised by the illegal movement of persons across borders for work in any part of the sex industry, with the use of threat, coercion, violence, abrogation of human and workers rights and economic exploitation. 19 The exact numbers of women and children who are trafficked are estimated to range from 700 000 to as high as 4 million. 15,16,18 What is clear is that trafficking increases the health risks of women and their risk of STI, because of their precarious social and legal situation, which makes access to sexual health care difficult if not impossible and their ability to demand safe working conditions very tenuous. 14,17,20,21

The purpose of the present study is to assess the current global literature on STI among FSW to lead to better monitoring, data collection and assessment procedures. In addition, we tried to find all studies that collected data on either trafficked, migrant or illegal FSW working in difficult to access venues, such as unlicensed brothels or in border areas between countries, as a way to provide indications of how future epidemiological studies might capture STI information among populations who are at higher risk of STI among FSW.

Methods

We conducted a review of the literature on STI among commercial sex workers, to: (1) describe world trends in the prevalence of multiple STI among FSW; (2) to examine what STI tests are the most commonly assessed in multiple assessment studies; and (3) to specifically review articles about STI procedures for FSW working illegally or in marginal venues. To do so, through MEDLINE searches, we retrieved studies conducted from 1995 to 2006 that met the following criteria: (a) data on prevalence rates of at least two STI; (b) detailed laboratory procedures and research methods; and (c) particular attention to studies that assessed trafficked, migrant, illegally working FSW or those in precarious social situations. The definition of ‘hard-to-access populations’ of FSW has been debated. 20–23 The terms used varied from study to study and region of the world (e.g. migrant workers without access to health care, clandestine workers, unregistered workers) and therefore we followed the authors’ designation of hard-to-access or marginalised populations. For example, in some countries where prostitution is officially illegal but tolerated, workers are relatively easy to access on the streets and in brothels. The studies were grouped according to the regions of the world that appear in the WHO HIV statistical tables 24 (Table 1 lists the full bibliographic details of each study in the order presented at the end of the Table). A pathogen had to be reported by at least two studies to be included in the table, and those pathogens that were tested but were not detected in the study are listed as 0.

Studies of only one pathogen, such as the study by Adaciefan and colleagues in Turkey, which tested for *C. trachomatis*, 25 a study in the Russian Federation of HIV 26 or human papillomavirus HPV among Thai FSW 27 were excluded.

Results

World trends

We identified 42 studies that reported the prevalence of multiple pathogens that included data from 44 different samples (two studies reported on two samples each), 28–30 representing 27 900 FSW. Studies were conducted in 29 countries (as listed in Table 1) and all regions of the world except the Caribbean region, with South Asia and Africa contributing nine and eight studies, respectively. In addition, where reported or calculable from the data reported, a measure of infection by any STI was also reported for 11 of the studies. This provided an estimate of the burden of disease attributable to all of the pathogens combined.

This summary measure showed that the highest prevalence of any STI was reported in countries of Africa, South Asia and Papua New Guinea (PNG), with low to moderate levels reported in other locales. *Neisseria gonorrhoea* was highly prevalent in Japan, Ghana, Bangladesh, Indonesia and PNG. Thus, most of the high prevalence countries were in the developing world (except Japan). High prevalence levels of *C. trachomatis* were found in diverse areas of the world – in Japan in one out of three studies, China, Israel, USA, in one out of two studies in PNG and Bangladesh, in both developed and developing countries. Syphilis did not have a consistent regional pattern with high prevalence rates found in Indonesia, Bangladesh, Dakar, South Africa, PNG and the USA. The highest rates of HIV were reported from countries in Africa; in six of eight studies from that region the HIV seroprevalence rates were over 20%.
Table 1. Prevalence of sexually transmissible infections (STI) in studies among female sex workers (FSW) worldwide, 1995–2006

<table>
<thead>
<tr>
<th>Region</th>
<th>Country</th>
<th>Ref.</th>
<th>Type of FSW</th>
<th>n</th>
<th>Population site</th>
<th>Prevalence</th>
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<tr>
<td>Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sub-Saharan Africa</td>
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<td>East Asia Pacific</td>
<td>China</td>
<td>58</td>
<td>New FSW at drop-in clinic</td>
<td>150</td>
<td>2.5</td>
<td>85</td>
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<td>Greece</td>
<td>48</td>
<td>FSW at STI clinic</td>
<td>230</td>
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<td>3.9</td>
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<td></td>
<td>Japan</td>
<td>57</td>
<td>Street workers</td>
<td>396</td>
<td>4.1</td>
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<td></td>
<td>Malaysia</td>
<td>54</td>
<td>FSW at brothel</td>
<td>608</td>
<td>3.5</td>
<td>5.2</td>
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<td></td>
<td>Philippines</td>
<td>55</td>
<td>FSW at brothel</td>
<td>1873</td>
<td>2.6</td>
<td>18.6</td>
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<td>59</td>
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<td>4.5</td>
<td>11.0</td>
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<td>FSW at brothel</td>
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<td>Peru</td>
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<td>FSW at brothel</td>
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<td>USA</td>
<td>52</td>
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Notes: AThis sample included 81 females, 20 males and one transsexual. BBaseline prevalence reported here, incidence data available from follow-up data. CSeries of studies – last year taken – results show decrease in STI. DThree were two studies from Benin – and prevalence from last year’s study. EReported from the highest prevalence sub-sample in six locations (brothels, street, massage-parlours, barber shops, call-girl houses, nightclubs). FThese data are from the same paper.
The highest rate was reported in a study from Ghana where over three-quarters of those assessed were HIV-positive. The other relatively high rate was reported in India (43%). However, in a study of street-based FSW in the USA who also smoked crack-cocaine, Jones et al. reported a rate of 28% seroprevalence, a high rate for the developing world and much higher than any European country, which all had rates below 3%. One other study looked at cocaine use, but reported only that it was considerably more common among FSW than non-FSW, without analysing the unique contribution of drug use to STI infection. However, in this study, the seroprevalence rate among FSW was under 1%. Trichomoniasis was moderately high in most regions where it was studied (ranging from 13% to 45%), except in Australia and China. The highest reported rate was in PNG with 51%. The rest of the pathogens were sporadically reported across the regions, with high rates of bacterial vaginosis reported in Africa and Latvia. The six studies that examined herpes simplex virus (HSV) were from different regions but all reported high prevalence rates (range between 59% and 86%), except for HSV type 2 in the USA with an overall prevalence rate of 26.8% among women deemed HPV the most common STI in the USA, working illegally, unregistered, and found that gonorrhea prevalence was five times greater and chlamydia infection twice as common among unregistered FSW as compared with registered FSW. Two studies, one in Canada and one in the USA, specifically looked out street-based drug users, runaways or children working in prostitution. Several studies noted the increased risk for STI among FSW who used drugs, particularly injecting drug users. The majority of studies were collected among FSW working either in regular venues (bars, sex clubs, brothels, streets) and some were specifically from licensed FSW who undergo regular health monitoring.34

Discussion

Nearly a million persons worldwide acquire a STI each day, and the associated morbidity causes pain, discomfort, high health care costs, and stigma in the short-run and long-term infertility, pregnancy complications, cervical cancer and in the case of HIV, drastically shortened life expectancy.34 Valid and inexpensive laboratory techniques to rapidly identify these infections must be a global public health priority and should be routinely accessible to all FSW wherever they work and whatever their legal status.49 A finding that was recurrent was the lack of concordance between reported symptoms and detected pathogens.24,31,35 Among these, the rates were low to moderate for specific STI with higher rates from India, Dakar, and a high rate (86%) of HSV (herpes) from Mexico. Six studies yielded ‘any STI’ as a summary parameter and these ranged from a low (6.5%) in Canada, to moderate (48%) in India and Israel and to a high rate (75%) in Dakar, suggesting a moderate to high rate of general STI disease burden. One study35,37,41 compared the rates between registered and unregistered FSW in the Philippines and found that gonorrhea prevalence was five times greater and chlamydia infection twice as common among unregistered FSW as compared with registered FSW. More studies of this type are needed to ascertain if the reported rates are higher or comparable to other FSW in the same regions; however, the general picture suggests that these hard-to-access populations have higher rates than FSW working under less precarious social conditions.

Two studies, one in Canada and one in the USA, specifically looked out street-based drug users, runaways or children working in prostitution. Several studies noted the increased risk for STI among FSW who used drugs, particularly injecting drug users. The majority of studies were collected among FSW working either in regular venues (bars, sex clubs, brothels, streets) and some were specifically from licensed FSW who undergo regular health monitoring. However, even with monitoring, venue makes a difference. A study from Australia compared the rates between brothel and street-based FSW and found higher rates of STI among street-based workers.48 When sex workers have access to regular health services to detect STI among FSW working illegally or in hard-to-access populations, such as runaway street FSW, who are still adolescents. Because these are often mobile, they are largely invisible to health and welfare agencies, who may be arrested or deported at any time, it may be advisable
to concentrate on these five pathogens and to develop rapid diagnostics that will reduce the time required to get STI results. This effort would be a great advantage to treat both registered, legally working FSW and hard-to-access FSW in whatever venues they may be working.

Women working in prostitution may suffer from the complications or late effects of STI infections, such as pelvic inflammatory disease (PID). PID is the most common serious complication of STI (60% of cases of PID can be attributed to an STI) and the long-term sequelae include chronic pelvic pain, tubal infertility and ectopic pregnancy. The increased risk of PID-induced infertility is a health problem that is particularly important as FSW try to transition out of full-time prostitution and move into other personal roles, such as trying to establish a family of their own with a permanent, non-client partner.28

Two studies29,30 assessed HIV among a population that were mostly trafficked (according to the UN protocol). One additional study was not included in our review because it assessed only one pathogen.31 Still, the results are revealing as they show that trafficked women relied on self-reports or estimated infection rates,14,20,64 without any clinical verification. For example, Beyrer and colleagues estimated that as many as 60% of Burmese Shan women who are trafficked into Thailand are HIV infected from sex work.32 Many of these women are girls between the ages of 12 and 16, when the infection rate from clients is particularly high because of the immature physiology of their cervix, which then affords less protection to infectious agents.33

In one study of a sample of mostly trafficked brothel workers, those who were trafficked showed more symptoms of occupational risk which included symptoms associated with STI (e.g. increased pain, vaginal and pelvic pain) than did those working legally.34 Increased occupational risk was associated with both past and current exposure to violence in the workplace. Trafficked women reported being examined by physicians to detect HIV, but not in response to their experienced symptoms and were not assessed for other pathogens.

Trafficked women especially are a largely ‘invisible population’ who are frequently mobile, at risk of deportation and retaliation from traffickers and brothel owners, which compromises their sexual health.35 For example, in a study of women from abroad who were working in the US sex industry (n = 12), 53% reported STI at least once or multiple times. Furthermore, among foreign and US women working in the US sex industry in this study, there was a great reluctance to disclose information about their STI status and history.36 The characteristics of trafficked women and other vulnerable groups, such as migrant FSW or drug-using FSW, working in the sex industry are such that their life circumstances and work increase their chances of STI, although at the same time limiting their ability to seek health care treatment. Other groups of women, such as illegal agricultural, domestic or factory workers, may be similarly at risk for undetected STI and increased STI because of precarious social circumstances that limit their access to quality health care services. Although these populations were not assessed in this study, future research on STI among women should specifically reach out to include these other vulnerable populations of women.

Thus, several issues are important to consider in future studies of trafficked and other hard-to-access groups of FSW: the young age of some of these groups may require special research and treatment protocols, the length of time working and exposure to violence as additional risk factors for STI infection and the need to go beyond self-reports to clinical verification of STI status. Special efforts are required to reach out to these hard-to-access populations among FSW, for research, epidemiological monitoring and to provide them with the sexual health services they so urgently need.29,65

The high rates of HPV reported both among FSW and in the general population,42−44 suggest that more studies are needed to identify the dynamics of HPV transfer among populations. Given the recent development and approval of an effective prophylactic vaccine for the prevention of cervical cancer, it is advisable to include HPV prevalence in future studies of FSW and among services provided to high-risk populations to identify women in need of more intensive STI follow-up.73

Given the high prevalence of men who pay for sex from FSW around the world29 and the high frequency of women in low-income communities who have at one point in their lives traded sex for remuneration,66 it is time to evolve a much more effective public health strategy to both protect FSW from being infected by their clients, prevent STI among their clients and prevent clients from transmitting STI to their regular sexual partners and wives.42,47−49 Current initiatives by WHO are a step in this direction but are not aimed specifically at FSW.51 The WHO strategy calls for including good STI screening and detection much more widely in primary care. When there is a government commitment to reduce STI and protect FSW, excellent results are possible. This was demonstrated in Thailand which has reduced STI dramatically since a safer sex prevention program was introduced in the early 1990s.41,71

Future studies should consider alternative methods of recruitment, both of trafficked FSW and their clients. One example is the method used by Gomes do Espirito Santo in Senegal by asking clients to answer questions and donate saliva for HIV testing as they exited the rooms of brothel-based prostitutes who had agreed to participate in the study.72,73 This is one way of bridging between high-risk men, FSW and low-risk women who are infected by their partners. In addition, the use of a global marker that represents the disease burden is the use of the parameter ‘any STI’. Only a quarter of the studies in this review made this calculation (or presented findings that allowed this calculation), which helps to compare across studies and regions, especially when multiple pathogens are being monitored. This parameter is therefore recommended for inclusion in future studies.

It is encouraging to note that several of the studies reported on reductions over time in STI among FSW following focussed educational interventions.74−78 Particularly promising both because of their ability to reach hard-to-access populations and
their cultural sensitivity are peer-mediated interventions led by FSW or former sex workers who receive special training.7,6

In the developing world, there is an urgent need to combine STI preventive education with community development and capacity building in comprehensive programs for women’s health promotion. Throughout the world, it is time to recognise that STI know no borders and are a major source of the burden of disease, necessitating the development of services for sexual health for all FSW, regardless of their working status.

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et al


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