

PREVALENCE OF HIV AND OTHER SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE COMMERCIAL SEX WORKERS IN ARGENTINA

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Abstract. Sexually transmitted infections (STIs) have shown to enhance the transmission of human immunodeficiency virus (HIV) and to be more common among female commercial sex workers (FSWs). A cross-sectional study was conducted among 625 FSWs in six cities of Argentina in 2000–2002. The seroprevalence of HIV, hepatitis B virus (HBV), hepatitis C virus (HCV), human T-cell lymphotropic virus type I/II, and syphilis was 3.2%, 14.4%, 4.3%, 1.6%, and 45.7%, respectively. Syphilis was associated with older age (≥ 30 years, adjusted odds ratio [AOR] = 2.6 to 4.9), ≥ 10 years in sex work (AOR = 2.2), use of illegal drugs (AOR = 2.1), and a prior history of an STI (AOR = 3.0). HBV and syphilis was the most common co-infection in 44 (7.5%) subjects. FSWs in Argentina are exposed to HIV and other STIs due to high-risk sexual and illegal drug use behavior. Renewed efforts are necessary to intervene effectively in this high-risk population.

INTRODUCTION

Sexual transmission accounts for a majority of cases of human immunodeficiency virus (HIV) infection worldwide.¹ Sexually transmitted infections (STIs) other than HIV have been found to enhance the transmission of HIV² and to be more prevalent among female commercial sex workers (FSWs).³

A history of multiple sex partners, irregular condom use by clients, and co-infection with other STIs constitute potential risk factors associated for HIV infection among FSWs.^{4,5} Elevated HIV prevalences (62–80%) have been reported in some countries of Africa, such as Kenya,⁶ Ivory Coast,⁷ and Ethiopia.⁸ By contrast, the prevalence of HIV among FSWs in Latin America appears to vary greatly, as low as 0–1% in South America (with the exception of Guyana and Brazil) and as high as 5–10% in certain countries of Central America, such as Guatemala and Honduras.^{9–11}

Argentina, after Brazil, is the country with the highest number of acquired immunodeficiency syndrome (AIDS) cases reported in South America.¹⁰ Of the approximately 27,000 AIDS cases reported in Argentina between 1982 and 2004, 30% of these were accounted through heterosexual transmission. However, during 2003, 47% of notified AIDS cases were due to heterosexual transmission. In this country, spillover of HIV transmission takes place from the high-risk groups of injection drug users into the heterosexually active general population.¹²

Hepatitis C virus (HCV), hepatitis B virus (HBV), human T-cell lymphotropic virus types I/II (HTLV-I/II), and syphilis infections are commonly reported in the same high-risk groups where HIV infection is present due to shared modes of transmission.¹³ A recent cross-sectional study conducted among 174 heterosexually active, HIV-infected men and women in Buenos Aires in 1999 reported prevalences of 30%

for HCV, 12.2% for HBV, and 3.8% for HTLV-I/II.¹⁴ In addition, an association between HTLV-I/II and HIV infection has been also observed among 237 FSWs in Buenos Aires in 1996.¹⁵ Thus, it is likely, although unproven, that viral pathogens such as HBV, HCV, HTLV-I/II, and *Treponema pallidum* (syphilis) infections may influence the HIV epidemic among FSWs in Argentina.

To better guide future HIV and STI-specific prevention strategies, an epidemiologic cross-sectional study was conducted among FSWs to estimate the seroprevalence of HIV and other STIs, as well as to identify potential risk factors for exposure to these STIs in Argentina.

MATERIALS AND METHODS

Study design and enrollment. This cross-sectional seroprevalence study was conducted among FSWs in six different cities of Argentina (Buenos Aires, Salta, Rosario, Córdoba, Mendoza, and La Plata) between March 2000 and March 2002. FSW participants from different cities were previously contacted through AMMAR (Asociación de Mujeres Meretrices de Argentina), a nongovernmental organization (NGO). The geographic location and number of inhabitants of the six cities are shown in Figure 1. FSW participants (following the UNAIDS definition,¹⁶ women who receive money or goods in exchange for sexual services, either regularly or occasionally, and who may or may not consciously define those activities as income generating) ≥ 18 years of age were eligible for this study. In Buenos Aires, street-based FSWs were contacted and referred to the offices of an NGO. In the other five cities, FSWs were contacted in the street, bathhouses, nightclubs, and brothels. Additionally, in each city, FSWs were also contacted by other FSWs.

Confidential one-to-one interviews were conducted on-site by psychologists and by health care workers with experience in HIV and STI prevention. During these encounters, the study was explained and subjects were invited to participate on a voluntary basis. Only those subjects who were willing to participate and provided written informed consent were enrolled and sampled. Study participants were interviewed us-

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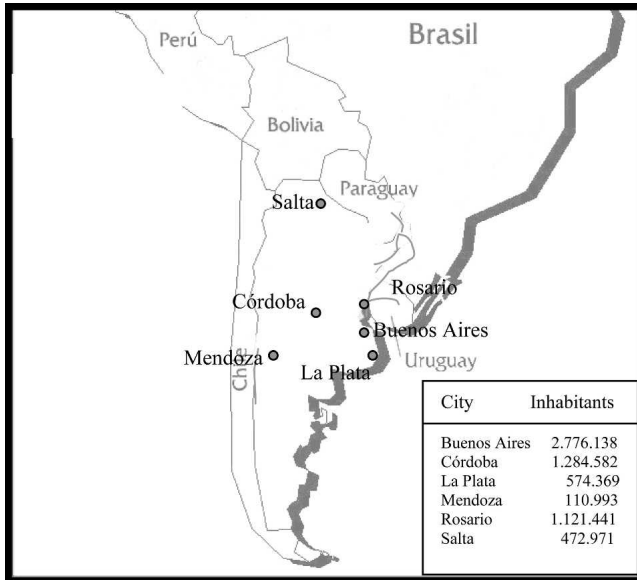


FIGURE 1. The geographic location and number of inhabitants of the six sampling sites in Argentina.

ing a standardized questionnaire with information regarding sociodemographic characteristics (age, nationality, educational level, marital status, jobs), sexual practices (numbers of sexual contacts, frequency of condom use with clients and steady partners, sexual contact with foreigners, years in sex work activity, place of work, most frequent sex practices, fee per sexual contact), current or past use of illegal drugs, alcohol consumption, and a prior history of an STI.

Serological test results were linked to the questionnaire by a unique numeric code that preserved confidentiality and anonymity of the participants. All participants received free STI counseling and HIV testing and were scheduled to return in a period of 2 weeks to receive their serological test results and post-test counseling. All HIV-positive participants were referred to an infectious diseases clinic for further clinical assessment and provision of antiretroviral treatment. This research was reviewed by institutional review boards and scientific ethical committees at the University of Buenos Aires and at the U.S. Naval Medical Research Center (NMRC) in the United States and was conducted in compliance with all federal regulations governing the protection of human subjects.

Blood sample collection and diagnosis of STI. A sample of anticoagulated blood was collected in sterile fashion for determination of STI. All sera samples were sent to the Centro Nacional para el SIDA laboratory for analysis. HIV diagnosis was performed by means of enzyme-linked immunosorbent assay (ELISA) and by agglutination techniques (GENSCREEN Plus HIV AgAb, BioRad; Marnes la Coquette, France; Serodia HIV, FUJIREBIO, Tokyo, Japan). Samples found to be reactive were confirmed by Western blot (WB) assay (Novapath HIV-I, Immunoblot, BioRad, CA). The presence of antibodies to HTLV-I/II was initially determined by particle agglutination technique (Serodia-HTLV-I, FUJIREBIO, Tokyo, Japan) and by ELISA (Platelia HTLV-1 New, BioRad, Marnes la Coquette, France). Those samples that resulted repeatedly reactive for HTLV-I/II were subsequently confirmed by WB (HTLV Blot 2.4, Genelabs

Diagnostics, Science Park, Singapore). Markers of infection by HBV, such as surface antigen (HBsAg) and anti-core antibody (anti-HBc) were determined by ELISA (HBsAg ELISA, Wiener Laboratories S.A.I.C., Rosario, Argentina; anti-HBc ELISA, Wiener Laboratories S.A.I.C., Rosario, Argentina). HBV infection was considered to be positive if at least one of the markers of HBV infection was present. To determine past infection with HCV, anti-HCV testing was performed by ELISA (anti-HCV ELISA, Wiener Laboratories S.A.I.C., Rosario, Argentina). Past infection with syphilis was determined by a recombinant ELISA (Sfíllis, ELISA recombinante; Wiener Laboratories S.A.I.C., Rosario, Argentina) at the Laboratorio de Hemoterapia, Hospital de Clínicas José de San Martín, Buenos Aires, Argentina.

Statistical analysis. Chi-square and Fisher's exact test were used to compare differences in categorical variables. ANOVA (analysis of variance) test was used to compare differences among means of continuous variables. Ninety-five percent confidence intervals (95% CI) for seroprevalence were estimated by using exact binomial formula. The magnitude of associations of potential risk factors in univariate analyses was expressed as odds ratio (OR). Multiple logistic regression analysis was applied to determine adjusted odds ratio by age and city (AOR). All risk factors that were found to be statistically significant in univariate analyses or with a $P < 0.05$ were entered into a forward, stepwise selection multivariate logistic regression to identify independent risk factors associated with HIV and STI. All reported P values were two-sided; P values < 0.05 were considered to be statistically significant. All statistical analyses were carried out using Epi-Info version 6.4 and STATISTICA (StatSoft, version 5, 1997 Edition).

RESULTS

Characteristics of study participants. A total of 625 FSW subjects were enrolled. Table 1 shows the sociodemographic and behavioral characteristics of study participants. Participants' age ranged from 18 to 73 years (mean = 33.8 years), and around three-fourths (456) of study participants were Argentinian. The foreigner FSWs were mostly from Paraguay (65), Dominican Republic (54), Brazil (17), Peru (12), and Uruguay (11). Only one in five FSWs reported having a second job (such as housewife or street saleswoman). Thirty-six percent (226) of subjects reported a high school education level.

Fifty-four percent (336) of FSWs reported a steady sexual partner. A pattern of irregular condom use (never or sometimes) with the steady partner was noted in almost 90% (294) of subjects. A prior history of an STI was reported by 21% (131) of study participants. Syphilis infection was the STI most frequently reported (10.2%), followed by urethritis (3.4%), and gonorrhoea (3.2%). Alcohol consumption (more than once a week) was reported among 139 (22%) FSWs. The cities of La Plata and Rosario reported higher alcohol consumption, which coincided with predominant work location in bars and cabarets in these cities. One-fourth (157) of subjects reported use of illegal drugs. Use of inhaled cocaine and marijuana smoking were frequently reported (12.2%) among participants. Only two FSWs reported injection drug use. In addition, sexual contact with foreigners was reported among 320 (51.2%) subjects; most of them from Brazil and Paraguay.

TABLE 1
Sociodemographic and behavioral characteristics among FSWs in six cities of Argentina, 2000–2002

Feature		Total (N = 625)	Cordoba (n = 86)	La Plata (n = 100)	Mendoza (n = 33)	Rosario (n = 12)	Salta (n = 98)	Buenos Aires (n = 296)
Age (years)	Mean (SD)	33.8 (10.8)	32.5 (10.2)	27.9 (7.2)	35.9 (10.7)	26.7 (4.9)	33.3 (11.2)	36.4 (11.1)
Nationality	Argentinian	456 (73)	84 (97.7)	38 (38)	32 (97)	2 (16.7)	98 (100)	202 (68.2)
	Other	169 (27)	2 (2.3)	62 (62)	1 (3)	10 (83.3)	0 (0)	94 (31.8)
Other occupation	Yes	125 (20)	3 (3.5)	16 (16)	5 (15.2)	3 (25)	29 (29.6)	69 (23.3)
	No	500 (80)	83 (96.5)	84 (84)	28 (84.8)	9 (75)	69 (70.4)	227 (76.7)
Educational level	≤ Elementary	399 (63.8)	59 (68.6)	51 (51)	26 (78.8)	11 (91.7)	60 (61.2)	192 (64.9)
	≥ High school	226 (36.2)	27 (31.4)	49 (49)	7 (21.2)	1 (8.3)	38 (38.8)	104 (35.1)
Steady partner	Yes	336 (53.8)	43 (50)	78 (78)	25 (75.8)	6 (50)	45 (45.9)	140 (47.3)
	No	289 (46.2)	43 (50)	22 (22)	8 (24.2)	6 (50)	53 (54.1)	156 (52.7)
Use of condom with steady partner	Regular	42 (6.7)	2 (4.7)	16 (20.5)	2 (8)	4 (66.7)	0 (0)	18 (12.9)
	Irregular	294 (87.5)	41 (95.3)	62 (79.5)	23 (92)	2 (33.3)	45 (100)	122 (87.1)
A prior history of an STI	Yes	131 (21)	16 (18.6)	27 (27)	7 (21.2)	4 (33.3)	35 (35.7)	42 (14.2)
	No	494 (79)	70 (81.4)	73 (73)	26 (78.8)	8 (66.7)	63 (64.3)	254 (85.8)
Alcohol consumption	≤ Once a week	486 (77.8)	74 (86)	43 (43)	25 (75.8)	0 (0)	90 (91.8)	254 (85.8)
	> Once a week	139 (22.2)	12 (14)	57 (57)	8 (24.2)	12 (100)	8 (8.2)	42 (14.2)
Use of illegal drugs	Yes	157 (25.1)	37 (43)	33 (33)	11 (33.3)	2 (16.7)	40 (40.8)	34 (11.5)
	No	468 (74.9)	49 (57)	67 (67)	22 (66.7)	10 (83.3)	58 (59.2)	262 (88.5)
Sexual contact with foreigners	Yes	320 (51.2)	35 (40.7)	82 (82)	24 (72.7)	12 (100)	66 (67.3)	101 (34.1)
	No	305 (48.8)	51 (59.3)	18 (18)	9 (27.3)	0 (0)	32 (32.7)	195 (65.9)

FSWs, female commercial sex workers; STI, sexually transmitted infection, SD, standard deviation.

Table 2 shows the characteristics of sexual work among FSWs. A great variability was observed in terms of time (years) in sex work (mean = 7.9, range = 1 to 47), and in the number of sexual contacts a week (mean = 14.5, range = 1 to 140). Approximately 90% of the study participants reported less than 30 clients a week. A higher number of sexual contacts a week was especially noted among FSWs from the city of Salta (mean = 28). The most frequent sexual practice was vaginal intercourse (82.1%), followed by oral sex (64.8%) and anal intercourse (8.5%). Irregular condom use with clients was reported by 113 (18.1%) subjects. Eighty-seven percent (516 of 593) FSWs responded that clients preferred not to use condom during the sexual act. Of these, only 9.3% (48) accepted their client's request. In addition, a pattern of irregular condom use was also found to be significantly higher with steady partners (87.5%) than with clients (18.1%, $P < 0.05$).

Seroprevalence of HIV and STI. Serologic screening for HIV infection was performed in 625 samples, for HTLV-I/II

in 614 samples, for HBV and HCV in 602 samples, and for syphilis in 598 samples. Missing serologic data was due to insufficient amount of serum for testing. The seroprevalence for HIV infection was 3.2% (range = 0.0% to 6.1%). HTLV-I/II prevalence was 1.6% (range = 0% to 4.1%), and seroreactivity against HTLV-I was noted in 7 of 10 HTLV positive samples. These seven positive samples were reported in the cities of Buenos Aires (2), Salta (4), and La Plata (1). HBV, HCV, and syphilis prevalences were 14.4% (range = 0% to 17.9%), 4.3% (range = 0% to 8.2%), and 45.7% (range = 16.7% to 77.6%), respectively (Table 3). Forty-eight (17.6%) of the 273 FSW participants who were tested positive for syphilis infection were already aware of their serological status.

Risk factors. Despite a slightly higher prevalence of HIV infection noted among Brazilian FSWs (5.9%), among whom some had agreed not to use condoms in exchange for extra pay (4.2%) and among whom were some illegal drug users

TABLE 2
Characteristics of sexual work among FSWs in six cities of Argentina, 2000–2002

Feature		Total (N = 625)	Cordoba (n = 86)	La Plata (n = 100)	Mendoza (n = 33)	Rosario (n = 12)	Salta (n = 98)	Buenos Aires (n = 296)
Time in sex work (years)	Mean (SD)	7.9 (8.4)	11.4 (9.9)	3.5 (4.6)	11.6 (9.9)	3.4 (4.8)	7.9 (7.6)	8.1 (8.5)
Number of sexual contacts a week	Mean (SD)	14.5 (14.4)	12.7 (10.2)	9.0 (8.0)	8.7 (7.0)	17.8 (9.4)	27.6 (25.5)	13.1 (9.7)
Fee per sexual contact*	Mean (SD)	22.4 (13.0)	18.3 (10.7)	33.4 (14.6)	16.6 (6.5)	29.6 (7.5)	7.5 (3.5)	25.2 (10.6)
Place of work	Street	403 (64.5)	72 (83.7)	10 (10)	22 (66.7)	1 (8.3)	9 (9.2)	289 (97.6)
	Other	222 (35.5)	14 (16.3)	90 (90)	11 (33.3)	11 (91.7)	89 (90.2)	7 (2.4)
Most frequent sexual practices	Oral	405 (64.8)	67 (77.9)	62 (62)	6 (18.2)	4 (8.3)	29 (29.6)	237 (80.1)
	Masturbation	38 (6.1)	0	16 (16)	1 (3.0)	0	0	21 (7.1)
	Vaginal	513 (82.1)	39 (45.3)	81 (81)	29 (87.9)	11 (91.7)	95 (96.9)	258 (87.2)
Use of condom with clients	Anal	53 (8.5)	2 (2.3)	17 (17)	2 (6.1)	0	0	32 (10.8)
	Regular	512 (81.9)	64 (74.4)	91 (91)	27 (81.8)	11 (91.7)	64 (65.3)	255 (86.1)
Clients offered extra pay for unprotected sex	Irregular†	113 (18.1)	22 (25.6)	9 (9)	6 (18.2)	1 (8.3)	34 (34.7)	41 (13.9)
	Yes	516 (87.0)	68 (80)	87 (87)	27 (81.8)	10 (83.3)	77 (78.6)	247 (93.2)
Acceptance of extra pay for unprotected sex (n = 516)	No	77 (13.0)	17 (20)	13 (13)	6 (18.2)	2 (16.7)	21 (21.4)	18 (6.8)
	Yes	48 (9.3)	2 (2.9)	6 (6.9)	2 (7.4)	1 (10)	20 (25.9)	17 (6.9)
	No	468 (90.7)	66 (97.1)	81 (93.1)	25 (92.6)	9 (90)	57 (75.1)	230 (93.1)

FSWs, female commercial sex workers; SD, standard deviation.

* Fee per sexual contact expressed in Argentinian pesos (approximately 3 pesos per U.S. dollar).

† Irregular condom use (never or sometimes).

TABLE 3
Seroprevalences of HIV, HTLV-I/II, HBV, HCV, and syphilis among FSWs in six cities of Argentina, 2000–2002

Agent		Total	Córdoba	La Plata	Mendoza	Rosario	Salta	Buenos Aires
HIV	No. positive/no. tested	20/625	2/86	1/100	2/33	0/12	5/98	10/296
	Prevalence	3.2	2.3	1.0	6.1	–	5.1	3.4
	(95% CI)	(2.0–5.0)	(0.4–8.9)	(0.1–6.2)	(1.1–21.6)	–	(1.9–12.1)	(1.7–6.3)
HTLV-I/II	No. positive/no. tested	10/614	0/86	1/100	0/33	0/12	4/98	5/285
	Prevalence	1.6	–	1.0	–	–	4.1	1.8
	(95% CI)	(0.8–3.1)	–	(0.1–6.2)	–	–	(1.3–10.7)	(0.6–4.3)
HBV	No. positive/no. tested	87/602	12/86	13/100	0/32	1/12	12/98	49/274
	Prevalence	14.4	14.0	13.0	–	8.3	12.2	17.9
	(95% CI)	(11.8–17.6)	(7.7–23.5)	(7.4–21.6)	–	(0.4–40.2)	(6.8–20.8)	(13.6–23.1)
HCV	No. positive/no. tested	26/602	2/86	2/100	2/32	0/12	8/98	12/274
	Prevalence	4.3	2.3	2.0	6.3	–	8.2	4.4
	(95% CI)	(2.9–6.4)	(0.4–8.9)	(0.3–7.7)	(1.1–22.2)	–	(3.8–15.9)	(2.4–7.7)
Syphilis	No. positive/no. tested	273/598	39/86	29/100	13/32	2/12	76/98	114/270
	Prevalence	45.7	45.3	29.0	40.6	16.7	77.6	42.2
	(95% CI)	(41.6–49.7)	(34.7–56.4)	(20.6–39.1)	(24.2–59.2)	(2.9–49.1)	(67.8–85.1)	(36.3–48.4)

FSWs, Female commercial sex workers; HIV, human immunodeficiency virus type 1; HTLV-I/II, human T-cell lymphotropic virus type I/II; HBV, hepatitis B virus; HCV, hepatitis C virus; 95% CI, 95 percent confidence interval.

(4.5%), not statistically significant risk factors were found to be associated with HIV infection.

Foreign nationality was found to be a protector factor for HBV infection (OR = 0.6, 95% CI = 0.4 to 0.9). Past HBV infection was more prevalent but not statistically significant associated among those FSWs without formal education level (26.9%), among those street-based FSWs (16.3%), and among those who reported a prior history of an STI (17.2%). By contrast, HCV infection was found to be statistically associated among those Argentinian FSWs (OR = 4.7, 95% CI = 1.1 to 29.3) compared to other FSWs, and among those who were 40–49 years of age (OR = 3.0, 95% CI = 1.1 to 8.3) compared to participants less than 30 years of age. A higher risk for HTLV-I infection was found among Argentinian FSWs than among those FSWs from other countries (OR = 28.3, 95% CI = 4.9 to 154.1).

Several potential risk factors were found to be associated with syphilis infection in univariate logistics regression analysis, including 30 years of age or older, Argentinian nationality, other occupation than sex work, more than 10 years in sex work, earning less than 10 Argentinian pesos (equivalent to 3–4 USD) per sexual contact, use of illegal drugs, not having a steady partner, as well as for those who reported a prior history of an STI and alcohol consumption (more than once a week) (Table 4). In multiple logistic regression analysis after adjusting for age and city, study participants who were 30 years of age or older, or among those who reported more than 10 years in sex work, use of illegal drugs and a prior history of an STI remained to be statistically significant associated with syphilis infection. In addition, four independent risk factors were found to be associated for syphilis infection by the multivariate logistic regression analysis: these

TABLE 4
Sociodemographic and sexual behavior factors found to be statistically significant associated for syphilis infection by univariate and multiple logistic regression analysis among FSWs in Argentina, 2000–2002

Feature	Category	Syphilis positive/ no. tested	Prevalence (%)	OR (95% CI)	AOR (95% CI)
Age group (in years)	< 30	79/254	(31.1)	Ref.	
	30–39	106/97	(53.8)	2.6 (1.8–3.8)	
	40–49	48/89	(53.9)	2.6 (1.6–4.2)	–
	> 50	40/58	(69.0)	4.9 (2.8–9.1)	
Nationality	Other	50/165	(30.3)	Ref.	Ref.
	Argentinian	223/433	(51.5)	2.4 (1.6–3.6)	1.5 (0.9–2.5)
Other occupation	No	205/481	(42.6)	Ref.	Ref.
	Yes	68/117	(58.1)	1.9 (1.2–2.9)	1.5 (0.9–2.3)
Time in sex work (years)	≤ 10	175/449	(39.0)	Ref.	Ref.
	> 10	98/149	(65.8)	3.0 (2.0–4.5)	2.2 (1.4–3.6)
Fee per sexual contact*	≥ 10	180/455	(39.6)	Ref.	Ref.
	< 10	88/133	(66.2)	3.0 (1.9–4.6)	0.8 (0.4–1.5)
Use of illegal drugs	No	190/447	(42.5)	Ref.	Ref.
	Yes	83/151	(55.0)	1.6 (1.1–2.4)	2.1 (1.3–3.2)
Steady partner	Yes	133/320	(41.6)	Ref.	Ref.
	No	139/277	(50.2)	1.4 (1.0–2.0)	1.1 (0.7–1.5)
A prior history of an STI	No	192/476	(40.3)	Ref.	Ref.
	Yes	81/122	(66.4)	2.9 (1.9–4.6)	3.0 (1.9–4.9)
Alcohol consumption	≤ Once a week	223/463	(48.2)	Ref.	Ref.
	> Once a week	50/135	(37.0)	1.6 (1.1–2.4)	0.9 (0.6–1.5)

STI, sexually transmitted infection; OR, odds ratio; AOR, adjusted odds ratio by age and city; 95% CI, 95 percent confidence interval; Ref., reference category for odds calculation.

* Fee per sexual contact expressed in Argentinian pesos (approximately 3 pesos per U.S. dollar).

were time exposure to sex work (OR = 8.2 per year, 95% CI = 2.3 to 29.1), age (OR = 6.9 per year, 95% CI = 1.9 to 24.5), other occupation than sex work (OR = 1.8, 95% CI = 1.1 to 2.8), and use of illegal drugs (OR = 1.7, 95% CI = 1.1 to 2.6).

Co-infections with STI. Co-infections with STI were analyzed for the 588 study participants in whom full serologic data was available. Almost one-half of study participants (47.1%) were negative for all STI agents analyzed. Approximately one-third (39.3%) of FSWs reported one STI, 71 (12.1%) of FSWs reported two STIs, and 8 (1.4%) reported three STIs. The distribution of co-infections is shown in Figure 2. The most common co-infection found was HBV and syphilis, which was detected in 44 (7.5%) of study participants. HTLV and HBV (OR = 12.0, 95% CI = 1.9 to 96.1) as well as syphilis and HBV (OR = 2.1, 95% CI = 1.3 to 3.4) were found to be significantly associated with each other.

DISCUSSION

The findings of this study clearly indicate that this population of FSWs was found to be at high risk of STIs, as illustrated by the high prevalence found for syphilis (45.7%), HBV (14.4%), HIV (3.2%), HCV (4.3%), and HTLV-I/II (1.6%) infections. Evidence of infection with these STIs was significantly higher compared with a group of healthy adult volunteer blood donors in Argentina in 2002 (0.95%, 1.03%, 0.25%, 0.74%, and 0.29%, respectively).¹⁷

This cross-sectional study provides an important opportunity to assess the status of the HIV infection among FSWs in different cities of Argentina and represents the first STI seroprevalence study conducted among FSWs in this country. Previous epidemiologic studies conducted among FSWs in Argentina have been based on samples from individuals who sought assistance (represented biased sampling), therefore the prevalences of HIV reported were probably overestimated, ranging from 1.4% to 2.3% in the city of Rosario¹⁸ and from 3.4% to 11.6% in the capital city of Buenos Aires.^{19–21} A previous cross-sectional study conducted among FSWs in Buenos Aires in 1996¹⁵ reported a prevalence of 6.3% for HIV and 13.2% for syphilis. However, this study was conducted among those FSWs who worked exclusively in brothels, and not especially among mostly street-based workers.

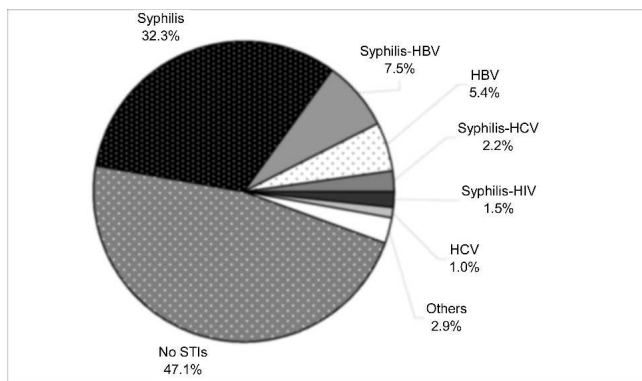


FIGURE 2. Distribution of viral co-infections among 588 FSWs in Argentina, 2000–2002. HIV, human immunodeficiency virus type 1; HBV, hepatitis B virus; HCV, hepatitis C virus; STIs, sexually transmitted infections.

Our study suggests that there may exist subpopulations of female sex workers that are likely to be more vulnerable to STIs than others. For example, FSWs from the northern city of Salta reported high STI prevalences, which is most probably associated with their poor working conditions in the region (as reflected by the lowest fee per sexual contact) and increases in risk behavior such as concomitant drug use, alcohol use, and risky (unprotected) sexual contact with clients. A higher prevalence of HTLV-I infection was also found in this city, a finding that correlates with the known higher level endemicity of HTLV-I among populations in the province of Jujuy (a neighbor province of Salta).²²

The high prevalence of syphilis found in this study (45.7%) contrasts with the results obtained in a similar study conducted among 212 FSWs who attended STI clinics/centers in Venezuela²³ in 2003 (2.4%). The low prevalence of syphilis reported may be attributed to the routine control of syphilis performed in Venezuela, where FSWs who are diagnosed with syphilis have their work licenses revoked until treatment is completed. In addition, a lower seroprevalence for HCV (0.5%), HBsAg (3.8%), anti-HBc (13.8%), and HIV (0%) infection were also noted.

Vaccination for HBV has been available since 1982²⁴; however, in Argentina it is not obligatory. Recently, it has become compulsory for children and preadolescents, but the adult population does not have access to this vaccine unless they buy it. Due to the high transmission rate of HBV and the unvaccinated adult population in Argentina, it is advisable to give the vaccine to the FSW population in whom a high prevalence has been reported as well as to recommend HBV vaccination to the adult heterosexual population.

The irregular condom use noted in this study especially among those FSWs with their steady partners suggests that female sex workers only consider being at high risk with clients or nonsteady partners. Future studies are necessary to better understand this behavior.

The high STI prevalences found among FSWs in Argentina suggest that it is essential that prevention programs focus not only on the high risks associated with commercial sex work but also the risks with other sexual partners (casual or steady). However, such programs need to be locally adjusted to the prevalent distribution of behavioral and societal factors associated with transmission of STIs among female sex workers and should not permit the stigmatization of and discrimination against this high-risk group.

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