

## SEX WORK

## Sex worker health: San Francisco style

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**Objectives:** To describe the characteristics of sex workers accessing care at a peer based clinic in San Francisco and to evaluate predictors of sexually transmitted infections (STI).

**Methods:** We conducted an observational study of sex workers at St James Infirmary. Individuals underwent an initial questionnaire, and we offered screening for STI at each clinic visit. We performed univariate, bivariate, and multivariable analyses to assess for predictors of STI in this population.

**Results:** We saw 783 sex workers identifying as female (53.6%), male (23.9%), male to female transgender (16.1%), and other (6.5%). 70% had never disclosed their sex work to a medical provider. Participants represented a wide range of ethnicities, educational backgrounds, and types of sex work. The most common substance used was tobacco (45.8%). Nearly 40% reported current illicit drug use. Over half reported domestic violence, and 36.0% reported sex work related violence. Those screened had gonorrhoea (12.4%), chlamydia (6.8%), syphilis (1.8%), or herpes simplex virus 2 (34.3%). Predictors of STI included African-American race (odds ratio (OR) 3.3), male gender (OR 1.9), and sex work related violence (OR 1.9). In contrast, participants who had only ever engaged in collective sex work were less likely to have an STI (OR 0.4).

**Conclusions:** The majority of sex workers have never discussed their work with a medical provider. Domestic violence is extremely prevalent as is work related violence. Working with other sex workers appears to be protective of STIs. STI prevention interventions should target African-American and male sex workers. Addressing violence in the workplace and encouraging sex workers to work collectively may be effective prevention strategies.

In June of 1999, the St James Infirmary (SJI) began providing free medical services for male, female and transgender sex workers in the San Francisco Bay Area. Leaders from the sex worker community, in collaboration with the San Francisco Department of Public Health STD Prevention and Control Section, started the clinic.<sup>1–3</sup> The stated mission of SJI is to provide compassionate and non-judgmental health care and social services for all sex workers while preventing occupational illnesses and injuries through a comprehensive continuum of services.<sup>4</sup> SJI is a weekly, peer based clinic, with the majority of staff and board members being former or current sex workers. The clinic uses a harm reduction approach, with an emphasis on engaging sex workers in addition to identifying and reducing the individual and community level risks associated with sex work.<sup>5</sup> Services offered include primary medical care, HIV and STI screening and treatment, transgender health, harm reduction and peer counselling, psychiatric evaluation and management, acupuncture, massage, support groups, food, clothing, and needle exchange. Additionally, clinic staff distributes safer sex supplies and offers HIV testing to sex workers in the setting of street and venue based outreach.<sup>6</sup> The purpose of this study is to describe the characteristics of sex workers accessing health care at this specialty sex worker clinic and to evaluate predictors of sexually transmitted infections (STI) among those sex workers testing for gonorrhoea, chlamydia, syphilis and herpes simplex virus 2 (HSV-2).

## METHODS

Since September 1999, we have been conducting an ongoing, prospective evaluation of all individuals accessing care at SJI. We limited this analysis to those current or past sex workers who sought care at SJI between September 1999 and November 2004. We defined sex work as the provision of

sexual services or performances in exchange for money or goods of economic value including but not limited to drugs, housing, and food.<sup>7</sup> Peer counsellors administered a structured intake questionnaire to sex workers during their initial visit to SJI. The questionnaire ascertained demographics, sex work history, drug use, social support, legal history, and violence. We modified the questionnaire in September 2001 to include additional questions about previous HIV and STI diagnoses, past drug use, and mental health history.

## STI testing

At the initial and any subsequent clinic visits, SJI staff offered voluntary screening for STI to all clinic patients. The medical providers and/or harm reduction counsellors decided which test(s) to obtain based on patient request and clinical judgment. In particular, all individuals reporting unprotected oral, vaginal, and/or anal intercourse were encouraged to undergo STI screening. There were no set screening intervals. Screening included pharyngeal, rectal, and urine based chlamydia (CT) and gonorrhoea (GC) nucleic acid amplification tests (LCx, Abbott Labs and BDProbeTec, Becton Dickinson) as well as syphilis (Venereal Disease Research Laboratory Slide Test (VDRL) with confirmatory SerodiaTP-PA, Fujirebio, Inc) and HSV-2 antibodies (HerpeSelect 2 ELISA for HSV IgG, Focus Diagnostics).

## Statistical analysis

Predictor variables included demographics, history of previous HIV and STI diagnosis, and behaviour self reported in the questionnaire. We analysed each type of sex work as a

**Abbreviations:** BDSM, bondage-dominatrix-sado-masochism; CT, chlamydia; GC, gonorrhoea; HSV, herpes simplex virus; IDU, injecting drug use; MTF, male to female; SJI, St James Infirmary; STI, sexually transmitted infections

**Table 1** Participant characteristics

Variable	% (n)	Male (n=187)	Female (n=419)	MTF (n=126)	Other (n=51)	p Value
Median age (range) (n=783)	33.1 (17–76)	33 (17–58)	30 (17–76)	35 (18–60)	31 (18–76)	<0.01
Race/ethnicity (n=783)						<0.001
White	58.4 (457)	63.1 (118)	62.8 (263)	31.8 (40)	70.6 (36)	
African-American	8.9 (68)	9.1 (17)	6.9 (29)	14.3 (18)	7.8 (4)	
Latino/a	10.1 (79)	9.6 (18)	6.0 (25)	24.6 (31)	9.8 (5)	
Asian-Pacific Islander	8.6 (67)	2.1 (4)	11.0 (46)	11.1 (14)	5.9 (3)	
Native American	1.8 (14)	1.6 (3)	1.7 (7)	3.2 (4)	0	
Mixed/other	12.5 (98)	14.4 (27)	11.7 (49)	15.1 (19)	5.9 (3)	
Highest level of education (n=743)		(n=167)	(n=404)	(n=124)	(n=48)	<0.001
≤8th grade	7 (52)	3.0 (5)	8.7 (35)	8.9 (11)	2.1 (1)	
High or technical school	45.2 (336)	41.3 (69)	42.1 (170)	60.5 (75)	45.8 (22)	
College or grad school	47.8 (355)	55.7 (93)	49.3 (199)	30.6 (38)	52.1 (25)	
Contact with family (n=783)	69.4 (543)	68.4 (128)	75.9 (318)	51.6 (65)	62.8 (32)	<0.001
Presence of support network (n=783)	80.8 (633)	77.5 (145)	82.6 (346)	81.0 (102)	78.4 (40)	0.51
History of arrest (n=757)	49.4 (374)	49.4 (81)	43.7 (178)	71.9 (87)	40.8 (20)	<0.001
Prostitution related conviction (n=757)	8.2 (62)	4.4 (8)	7.1 (29)	19.0 (23)	4.1 (2)	<0.001
Partner/family violence (n=783)	53.4 (418)	44.4 (83)	55.1 (231)	57.9 (73)	60.8 (31)	<0.05
Sex work related violence (n=783)	36.0 (282)	26.7 (50)	36.3 (152)	53.2 (67)	25.5 (13)	<0.001
Customer	27.8 (218)	18.2 (34)	28.4 (119)	42.9 (54)	21.6 (11)	<0.001
Employer/manager/pimp	9.1 (71)	3.2 (6)	12.4 (52)	8.7 (11)	3.9 (2)	<0.01
Police	8.4 (66)	4.8 (9)	7.9 (33)	17.5 (22)	3.9 (2)	0.001
Disclosure to medical provider (n=714)						<0.05
Always	12.6 (90)	10.8 (18)	11.7 (45)	19.7 (23)	8.9 (4)	
Sometimes	17.4 (124)	12.6 (21)	17.4 (67)	23.1 (27)	20.0 (9)	
Never	70.0 (500)	76.6 (128)	70.9 (273)	57.3 (67)	71.1 (32)	

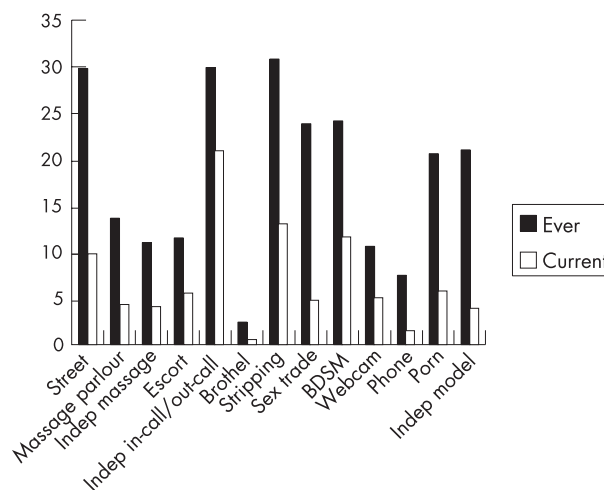
MTF, male to female.

distinct predictor variable. For the purpose of multivariable analysis, we categorised the sex workers into three mutually exclusive groups—those who had engaged in exclusively independent sex work, both independent and collective sex work, and exclusively collective sex work. Independent sex work included street based, independent massage, independent in-call/out-call, sex trades, webcam based sex work, phone sex, and independent modelling. Collective sex work included massage parlours, escort, brothels, stripping, bondage-dominatrix-sado-masochism (BDSM), and pornography. The main outcome variable was any positive chlamydia, gonorrhoea, syphilis, or HSV-2 screening test. Some individuals underwent repeat STI screening, so we calculated the percentage of positive STI results as the proportion of unduplicated sex workers with any positive test among the total population of individuals testing. We performed univariate analysis, calculating proportions and means/medians for the demographic, health history and behavioural data, as appropriate. We then performed bivariate analysis, using the  $\chi^2$  test or Fisher’s exact test for categorical variables and Student’s *t* test for continuous predictor variables. We assessed for multicollinearity and normal distribution. We performed logistic regression using forward stepwise technique including those variables with a p value <0.2 by bivariate analysis.<sup>8</sup> A p value of <0.05 was considered statistically significant. We evaluated all models using likelihood ratio and goodness of fit tests and conducted all analyses using Stata SE 8.0 statistical software (College Station, TX, USA).

We obtained approval to conduct this study by the committee on human research at the University of California San Francisco.

**RESULTS**

Overall, we conducted intake questionnaires on 783 sex workers who identified as female (53.6%), male (23.9%), male to female (MTF) transgender (16.1%), or other gender (6.5%). Of these 783 sex workers, 230 underwent the original intake questionnaire and the remaining 553 were administered the modified intake questionnaire. Table 1 shows the characteristics of participants.



**Figure 1** Types of sex work.

The mean age of participants was 33.1 (SD) 9.4; range 17–76), and this differed significantly by gender. Race/ethnicity and educational level also differed significantly by gender.

**Sex work**

As described in figure 1, clinic attendees participated in a diverse array of sex work activities including street based, massage parlour, independent sexual massage, escort, independent in-call/out-call, brothel, stripping/dancing, sex trades (for example, for housing, drugs, food), BDSM, webcam/internet, phone sex, pornography and independent modelling for customers. With sex specifically defined as oral, anal, vaginal intercourse, sharing sex toys, and/or manual stimulation, 95% of participants reported having sex as part of their sex work, and this finding did not differ by gender, though it vary by type of sex work. Strippers were less likely to have sex as part of their sex work (86.3%; p<0.001) as were those engaged in BDSM (85.7%; p<0.001).

**Table 2** Health behaviour, STI history, and current STI

Variable	% (n)	Male	Female	MTF	Other	p Value‡
Illicit drug use ever (n=756)	61.2 (463)	71.3 (129)	55.2 (224)	64.5 (78)	66.7 (32)	<0.01
History of IDU (n=756)	22.9 (173)	27.6 (50)	16.3 (66)	33.9 (41)	33.3 (16)	<0.001
Current use						
Tobacco (n=756)	46.0 (348)	48.6 (88)	41.4 (168)	57.0 (69)	47.9 (23)	<0.05
Any illicit drug (n=755)	39.6 (299)	53.3 (96)	35.7 (145)	29.8 (36)	45.8 (22)	<0.001
Methamphetamines (n=755)	19.5 (147)	29.8 (54)	13.3 (54)	24.8 (30)	18.8 (9)	<0.001
Heroin (n=755)	9.0 (68)	8.3 (15)	8.9 (36)	8.3 (10)	14.6 (7)	0.57
Cocaine/crack (n=755)	20.4 (154)	27.1 (49)	18.0 (73)	17.4 (21)	22.9 (11)	0.06
Current injection drug use (n=756)	7.9 (60)	11.0 (20)	5.9 (24)	9.1 (11)	10.4 (5)	0.15
Self reported infections* (n=543)						
Genital herpes	9.6 (52)	8.7 (11)	12.3 (34)	3.0 (3)	10.3 (4)	<0.05
Gonorrhoea	14.4 (78)	23.6 (30)	10.1 (28)	15.8 (16)	10.3 (4)	<0.01
Chlamydia	13.4 (73)	12.6 (16)	17.4 (48)	1.0 (1)	20.5 (8)	<0.001
Genital warts	11.6 (63)	7.9 (10)	15.6 (43)	6.9 (7)	7.7 (3)	<0.05
Syphilis	5.0 (27)	7.9 (10)	1.8 (5)	10.9 (11)	2.6 (1)	0.001
HIV (n=495)	8.7 (43)	16.0 (19)	1.2 (3)	20.0 (19)	5.3 (2)	<0.001
Any STI† (n=456)	105 (23)	31.9 (36)	17.9 (45)	25.0 (18)	30.0 (6)	<0.05
Gonorrhoea‡						
Pharyngeal (n=199)	6.0 (12)	8.8 (5)	1.1 (1)	10.3 (4)	18.2 (2)	0.01
Rectal (n=120)	4.2 (5)	7.3 (3)	0	5.3 (2)	0	0.50
Urine (n=421)	1.9 (8)	5.7 (6)	0.4 (1)	1.6 (1)	0	0.01
Chlamydia‡						
Pharyngeal (n=171)	0.6 (1)	2.3 (1)	0	0	0	0.50
Rectal (n=97)	5.2 (5)	3.4 (1)	3.4 (1)	8.8 (3)	0	0.71
Urine (n=428)	1.9 (8)	3.7 (4)	1.7 (4)	0	0	0.43
HSV-2† (n=230)	34.8 (80)	41.4 (24)	30.4 (38)	34.3 (12)	50 (6)	0.33
Syphilis† (n=387)	1.8 (7)	2.1 (2)	0.9 (2)	3.3 (2)	5.3 (1)	0.15

MTF, male to female; IDU, injecting drug use.

\*These data were ascertained on the modified questionnaire only.

†Prevalence of any STI, gonorrhoea, chlamydia, HSV-2, and syphilis was calculated as the proportion of individuals with any positive STI result among all individuals tested for each particular STI. Overall, 456 individual sex workers (58.2%) were tested for one or more STI.

‡We performed a Fisher exact test if fewer than five outcomes in any category, otherwise we used a  $\chi^2$  test.

### Social support

Overall, 69.4% of participants stated that they were in contact with their family, though MTF were less likely to be so. Eighty one per cent of sex workers reported having a support network or community. The presence of a network/community did not differ by gender but did by current type of sex work. Street based sex workers were less likely to have a network/community (60.0%;  $p < 0.001$ ). On the other hand, strippers were more likely to report having a network/community (93.1%;  $p = 0.001$ ) as were those involved with BDSM (91.1%;  $p < 0.05$ ).

### Legal history

Almost half of participants had been arrested in the past, with MTF sex workers more likely to be arrested and convicted of sex work related charges. Those most likely to be arrested included those involved with street based work (74.2%;  $p < 0.001$ ), sex trades (63.7%;  $p < 0.001$ ), and escort (65.2%;  $p < 0.001$ ).

### Violence

Fifty three per cent of participants reported a history of family/partner violence. In addition, 36.0% reported a history of sex work related violence. MTF sex workers were at significantly higher risk of work violence, customer violence, and police violence. Also at higher risk of work related violence included those engaged in street based sex work (61.8%;  $p < 0.001$ ), sex trades (56.6%;  $p < 0.001$ ), massage parlours (48.1%;  $p = 0.01$ ), and stripping (43.2%;  $p < 0.05$ ). Legal history was also significantly associated with violence, with 47.1% of those ever arrested experiencing work related violence compared to 25.9% of those without a history of arrest ( $p < 0.001$ ).

### Sex work disclosure

Seventy per cent of patients had never disclosed their sex work to a healthcare provider before their initial visit to SJI.

MTF sex workers were significantly more likely to disclose to providers. The reasons for not disclosing one's sex work history included negative past experiences with disclosure (4.8%), fear of disapproval (31.2%), embarrassment (7.6%), and not thinking their sex work was relevant to their health needs (31.8%).

### Drug use

The most common substance reported was tobacco, with 46.0% of participants currently smoking (table 2).

Nearly 40% of participants reported current illicit drug use. Male sex workers were the most likely to be actively using drugs, particularly methamphetamines. Although there were no gender differences in current injecting drug use (IDU), MTF were more likely to have a history of IDU and were more likely to be current smokers.

### Self reported history of STI

Forty four percent of sex workers described a history of any STI, including genital herpes, gonorrhoea, chlamydia, genital warts, syphilis, non-gonococcal urethritis, trichomonas, and pelvic inflammatory disease. In addition, 91.2% of patients had undergone HIV testing in the past, with 8.7% having tested positive. Prevalence of known HIV infection was highest among MTF and men.

### Current STI

Overall, 58.2% of patients underwent testing for STI. Compared with those who did not test, STI testers were significantly younger (31.8 v 34.8 years old), though testing uptake did not differ by gender, current drug use, type of sex work, or ethnicity. Those with a known diagnosis of HIV, however, were significantly less likely to undergo STI screening (39.5%;  $p < 0.01$ ). Among testers, the proportion of those with at least one positive test included 34.3% for HSV-2, 12.4% for gonorrhoea, 6.8% for chlamydia, and 1.8% for syphilis. In bivariate analysis, there was no association

**Table 3** Predictors of STI among sex workers: bivariate and multivariable analyses

Predictor variable (n)	STI testing	STI positive	Odds ratio (95% CI)	
	% (n)	% (n)	Unadjusted	Adjusted*
All participants (n = 783)	58.2 (456)	23.0 (105)		
<b>Ethnicity (783)</b>				
African-American (68)	47.1 (32)	50.0 (16)	3.8 (1.8 to 7.8)	3.3 (1.3 to 8.3)
White (457)	58.4 (267)	19.9 (53)	0.7 (0.4 to 1.0)	
Latino/a (79)	62.0 (49)	28.6 (14)	1.4 (0.7 to 2.7)	
Asian-Pacific Islander (67)	61.1 (41)	17.1 (7)	0.7 (0.3 to 1.5)	
Native American (14)	50 (7)	14.3 (1)	0.6 (0.1 to 4.6)	
Mixed/other (98)	61.2 (60)	23.3 (14)	1.0 (0.5 to 1.9)	
<b>Gender (783)</b>				
Male (187)	60.4 (113)	31.9 (36)	1.9 (1.2 to 3.0)	1.9 (1.0 to 3.6)
Female (419)	59.9 (251)	17.9 (45)	0.5 (0.3 to 0.8)	
MTF (126)	57.1 (72)	25.0 (18)	1.1 (0.6 to 2.0)	
Other (51)	39.2 (20)	30.0 (6)	1.5 (0.5 to 3.9)	
<b>Education (743)</b>				
Middle school or less (52)	55.8 (29)	13.8 (4)	0.5 (0.2 to 1.5)	
High or technical school (336)	55.4 (186)	21.5 (40)	0.9 (0.6 to 1.4)	
College or grad school (355)	61.7 (219)	25.1 (55)	1.3 (0.8 to 1.9)	
<b>Type of sex work (ever)</b>				
Independent only (218)	56.9 (124)	28.2 (35)	1.5 (0.9 to 2.4)	
Collective and independent (336)	62.5 (210)	24.8 (52)	1.2 (0.8 to 1.8)	
Collective only (143)	55.9 (80)	11.2 (9)	0.4 (0.2 to 0.8)	0.4 (0.1 to 0.9)
<b>Violence</b>				
Sex work related violence (282)				1.9 (1.1 to 3.3)
Domestic violence (418)	56.7 (237)	24.9 (59)	1.2 (0.8 to 1.9)	
<b>Legal history</b>				
History of arrest (374)	54.5 (204)	27.4 (56)	1.6 (1.0 to 2.4)	
Sex work related conviction (62)	56.4 (35)	28.6 (10)	1.4 (0.6 to 3.0)	
<b>Drug use</b>				
Tobacco use (current) (348)	55.2 (192)	27.6 (53)	1.6 (1.0 to 2.4)	
Illegal drug use (current) (299)	61.5 (184)	21.2 (39)	0.8 (0.5 to 1.3)	
Injection drug use (current) (60)	51.7 (31)	22.6 (7)	1.0 (0.4 to 2.3)	

\*Final multivariable model built using forward stepwise technique, including variables significant at  $p < 0.2$  in bivariate analysis. The final multivariable model adjusted for age, race/ethnicity, educational level, category of sex work, current drug use, and history of sex work related violence.

found between presence of an STI and educational level, drug use, domestic violence or violence in the setting of sex work.

African-American sex workers were at highest risk of having an STI (50%;  $p < 0.001$ ) and, specifically, HSV-2 (70.6%;  $p = 0.001$ ). Those ever engaging in escort work were more likely to be diagnosed with any STI (35.7%;  $p < 0.05$ ), as were those engaging in phone sex (43.6%;  $p = 0.001$ ). Another predictor of positive STI included a history of chlamydia (40.4%;  $p < 0.05$ ). Eighty per cent of those with a reported history of genital herpes were found to have antibodies against HSV-2, and over 34% of those without a known history of genital herpes were found to have HSV-2 antibodies ( $p < 0.05$ ). Lastly, those with a history of arrest were more likely to have an STI (27.4%;  $p < 0.05$ ).

In multivariable analysis, predictors of testing positive for an STI included African-American race (OR 3.3; 95% confidence interval (CI) 1.3 to 8.3), male gender (OR 1.9, 95% CI 1.0 to 3.6), and having a history of sex work related violence (OR 1.9; 95% CI 1.1 to 3.3). On the other hand, those with a history of only engaging in collective sex work were significantly less likely to test positive for an STI (OR 0.4; 95% CI 0.1 to 0.9).

## DISCUSSION

By characterising sex workers seeking care at a peer based specialty clinic, we have gained a window into the diverse sex industry in San Francisco. The sex workers covered a wide range of socioeconomic and racial/ethnic backgrounds and engaged in an extensive array of types of sex work.<sup>9</sup> Even defining sex work broadly, nearly all of these individuals, including strippers and phone sex workers, reported being sexually active in their sex work.

As has been seen in other studies, sex workers commonly reported illicit drug use.<sup>10</sup> As we have demonstrated before,

however, the most common substance used in this population was tobacco.<sup>11</sup> Violence, particularly at the hands of partners and family members, was markedly common in the lives of the sex workers we studied.<sup>12</sup> We also demonstrated the significant risk of customer, sex work employer/manager/pimp, and police related violence.<sup>12-13</sup> Street based and sex trade sex workers had the highest risk of sex work violence. None the less, many types of "indoor" sex work, including massage and stripping, were also associated with an increased risk of work related violence.<sup>14</sup>

While nearly all participants had previously tested for HIV, the vast majority had never discussed their sex work history in the healthcare setting. In our study, both self reported history of STI and documented STI prevalence was, overall, lower than has been seen in other studies of urban sex workers.<sup>11-15-17</sup> None the less, there were factors found to be associated with increased risk of STI in this population, including African-American race, male gender, and sex work related violence. Furthermore, risk of STI differed significantly by type of sex work. Interestingly, those working collectively with other sex workers were less likely to have an STI.

While this study depicts the landscape of the sex industry in San Francisco, there certainly are limitations. In particular, we had limited information on specific sexual practices with different types of sexual partners and, thus, could not fully explore the complex set of factors that constitute STI risk. While we attempted to ascertain detailed sexual histories, many of the sex workers expressed difficulty in accurately quantifying the number of partners and sex acts. Another limitation of this study was the use of a convenience sample of sex workers accessing health care at a sex work specific clinic. This self selected population may not represent the larger population of female, male, and transgender sex workers in San Francisco and, therefore, estimates of STI

prevalence may be biased. Furthermore, STI screening was offered to but not performed on all patients. Furthermore, repeat testing and the interval of such testing were, ultimately, decided by each individual patient.

Despite these limitations, there is value in assessing the local sex work environment and using this as the basis for public health interventions. Indeed, additional work must also be done to maximise the uptake of voluntary STI screening, particularly among HIV infected sex workers. This study suggests that STI prevention efforts in San Francisco must increasingly target sex workers who are African-American, male, and work independently of other sex workers. Moreover, anti-violence interventions should be an integral part of STI prevention. Our finding of decreased risk of STI among those individuals who have worked collectively with other sex workers is intriguing and warrants further study.

The St James Infirmary represents a novel collaborative effort between public health officials and the sex worker community. Through this unique model, sex workers have helped define public health priorities for their own community and public health officials have gained access to this hidden and stigmatised population.

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### CORRECTION

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In the February issue of the journal there was an error in the paper by Hamlyn E, McAllister J, Winston A *et al* (Is screening for sexually transmitted infections in men who have sex with men who receive non-occupational HIV post-exposure prophylaxis worthwhile? *Sex Transm Infect* 2006;**82**:21-3). In reference 10, the initial of the first author was incorrect. The correct name is K Manavi.