

## A Comparison of HIV Infection and Related Risks Among Male Sex Workers in Different Venues in Shenzhen, China

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**Abstract** Different risks of HIV infection have been reported among different types of male sex workers (MSW). In order to compare the prevalence of HIV infection and related risk behaviors of MSW in different venues in Shenzhen, China, a time-location sampling survey was conducted in 2008. 5.1% of the 394 MSWs were tested positive for HIV, with 6.9% in those working in parks (PMSW), 11.3% in small family clubs (FMSW) and 1.7% in entertainment venues. PMSWs and FMSWs reported a higher proportion of self-identified homosexual/gay. Moreover, FMSWs reported a lower coverage of HIV-related education and services and were more likely to self-report coming from provinces with higher HIV prevalence. The results indicated that MSWs in small venues and parks were comparatively at higher risk of being infected and suggested that current HIV preventive intervention needs to be expanded to the small venues in Shenzhen.

**Keywords** Male sex workers · HIV infection · Syphilis · Venue · Time-location sampling · China

### Introduction

HIV epidemic among men who have sex with men (MSM) is an increasing concern in China [1–6]. Male sex workers (MSWs), also known as men who sell sex to men or “money boys” (MB), are particularly at high risk. However, literature reporting the HIV prevalence and related characteristics of MSWs in China is still very limited [7, 8].

Street MSWs and brothel MSWs (or agency-based MSWs) can be regarded as different subgroups with different characteristics and risks. Some studies conducted in Western countries indicated that street MSWs have relatively higher rates of HIV-related risky sexual behaviors and higher rates of injection drug use than other types of MSWs [9, 10]. By comparison, MSWs who typically solicit clients through an agency (i.e., “indoor MSW,” “call boy” or “escort”) appeared to engage in less risky behavior with their commercial sex partners than do street workers [11]. In addition, a number of risk factors for HIV infection among MSWs have been reported in Western countries, including certain risky sexual behaviors with paying or non-paying sexual partners, the location where MSWs meet clients, as well as being sero-positive for syphilis or other sexual transmitted infections [12, 13]. However, no venue-related MSWs study has been reported in China.

Shenzhen is a newly developed city located in the southern tip of China and shared a border with Hong Kong. The city has one of the largest migrant populations in China, which accounts for more than 85% of the total population [14]. In accordance with an overall trend of

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migration of people from rural places in inland China to Shenzhen, the city also attracts MSM from different parts of China, including Hong Kong, for the job opportunities and open atmosphere of the city. It was estimated that there were 65,860–96,600 MSMs living in Shenzhen City by 2006 [15]. Together with the MSMs from Hong Kong who seek cross-border same-sex partners (15.2%) [16], the MSM community in Shenzhen expanded rapidly. The large number of MSMs drove up the demand for MSWs despite their illegal status in China. The total number of MSWs in Shenzhen exceeded 4,000 (documented data from Shenzhen CDC). Most of them were agency-based and controlled or managed by a boss or manager (pimps). They could be divided into two subgroups: (1) MSWs working at big entertainment venues like bars and massage centers (EMSW), acting like waiters or masseurs but providing sex services under the table. They usually worked in large groups (16–80 MSWs in a venue). (2) MSWs acting like call boys in family clubs, a kind of small home-based call boy brothel (FMSW). There were fewer MSWs working in each family club (average 8 MSWs, with a range of 3–15) and no existing license for entertainment services, but a just an illicit sex trade. (3) Besides the agency-based MSWs, there was a significant proportion of MSWs who were self-employed and found clients by going to public MSM venues like parks (PMSW), thus acting as street MSWs. Nearly all of these MSWs also solicited clients over the internet.

The HIV prevalence among MSMs was 5.1% (0.5–12.5%) [1, 2, 6, 17–20] with an unequal distribution among geographic areas in China. A significantly higher prevalence was observed in poor southwest area (Sichun, Chongqing, Yunnan and Guizhou, the four provinces located in southwest China with >10% HIV prevalence among MSMs) [21]. But very few of the research studies previously published discussed venue-based prevalence [18], though most of the health education and interventions relied on outreach efforts that were fully based in venues. Up to this point, all HIV-related health education and intervention strategies have mainly focused on big entertainment venues in Shenzhen for the purpose of covering more target populations with one outreach effort. Health education and condom distribution were occasionally provided in parks. The variance between venues of services being offered might influence the HIV risks among MSWs working in the venues. Our previous study on MSWs reported venue as one of the independent determinants related to HIV infection [22]. To better understand the correlates of different working venues for HIV and syphilis infection, and to identify risky sexual behaviors among MSWs in different venues, we compare the characteristics among MSWs working in bars/massage centers, family clubs, and parks, with data

collected from a time-location sampling survey conducted in 2008.

## Methods

### Sampling Procedures and Participants

The recruitment of participants was carried out from April to July 2008, using the venue-day-time (VDT) sampling scheme, also known as time-location-sampling (TLS) [23]. We surveyed venues providing commercial sex for MSM. In total, 38 venues were randomly selected from all available venues (48 venues) with 16 venues selected per month. A monthly work calendar was planned based on the randomly selected VDTs. At the sampled VDTs, men were approached by our survey staff and asked brief eligibility questions. Criteria of eligible MSWs in the study included: (1) more than 18 years of age; (2) having lived in Shenzhen for more than 1 month at the time of the survey; (3) ever had sold sex (oral or anal) to another man during the period of time they lived in Shenzhen [22].

### Behavioral Measures

The participants were invited to participate in a behavioral survey by finishing a guided self-administered questionnaire focusing on their demographic information, commercial and noncommercial sexual behavior, drug use, history of sexually transmitted infection (STI), access to HIV services, HIV-related knowledge and condom use knowledge. High HIV prevalence hometown areas were defined as the southwest provinces including Sichuan, Chongqing, Yunnan and Guizhou, the four provinces with >10% HIV prevalence by the 2008 National MSM surveillance study [21]. There were nine core questions to evaluate HIV-related knowledge [24]. A high knowledge level was defined as having answered correctly six or more out of the nine core questions. Coverage of prevention services was defined as receiving any services including condom distribution, lubricant distribution, peer education, STI diagnosis or treatment, HIV counseling or testing, or AIDS/STI educational materials in the past year. No risky anal sex was defined as no anal sex in the past 6 months or consistent use of condoms during anal sex with men; any other responses were coded as unprotected anal intercourse (UAI).

### HIV and STI Testing

The participants were asked to have their blood drawn for HIV and syphilis testing according to standard procedures established by the Shenzhen CDC laboratory. In brief, HIV

was tested using a rapid test (Determine HIV-1/2/O, Abbott Laboratories, IL) and ELISA (enzyme linked immunosorbent assay, Wantai Biotech Inc, Beijing) for screening and Western Blot (Genlabs Diagnostics, Singapore) for confirmation. Syphilis was tested with rapid plasma regain method (Rongsheng Biotech Inc, Shanghai) for qualitative screening and *Treponema pallidum* particle agglutination assay (Fujirebio Inc, Japan) for confirmation.

#### Data Analysis

A descriptive analysis was first performed to examine the distributions of demographic characteristics and sexual behavior patterns including commercial sex work status. Pearson's  $\chi^2$  tests and Fisher's exact tests were carried out to determine the extent to which each of the demographic and behavioral variables was associated with different MSW settings. Data were adjusted for the recruitment rate of each event through the weighting of cases using percentage of enumeration divided by percentage of actually finished questionnaires [23]. Multivariate logistic regression was then undertaken to evaluate the determinants for HIV risk from different candidate variables among the different groups while controlling for confounding factors. Candidate variables included in the analysis were: hometown, length of time living in Shenzhen, occupation status, sexual orientation, number of non-commercial male partners in the previous 6 months, commercial male clients in the previous 1 month, payment for each encounter with male client, exclusive receptive anal intercourse with male clients, ever having received HIV related services, previous HIV test within 6 months, duration of sex work, unprotected anal intercourse with male clients, and unprotected anal intercourse with non-commercial male partners. Further, a comparison was conducted between MSWs coming from high HIV prevalence areas [21] and other areas.

#### Results

A total of 494 potential participants were identified, of whom 456 men meeting eligible criteria (92.3%) were approached successfully for screening, including 70 from parks, 142 from family clubs and 244 from entertainment venues. Finally, 394 (86.4%) of the eligible participants participated and completed both the survey and biological testing, including 40 (57.1%) street MSWs from public areas like parks and public restrooms (PMSW, or self-administered MSWs), 119 (83.8%) call boys from family clubs (FMSW, each club hold <15 MSWs) and 235 (94.3%) non-independent escorts (or call boys) from entertainment venues like bars and massage centers (EMSW, each venue hold  $\geq 15$  MSWs). The PMSW represented the smallest

organizations, while FMSW worked in bigger organizations and EMSW worked in the biggest organizations.

#### HIV/Syphilis Infections

Of the 394 participants, 21 MSWs were tested to be HIV-seropositive, for an adjusted (by recruitment rate) HIV positive rate of 5.1% (95% CI 3.1–7.5). The rates were 6.9% among PMSWs, 11.3% among FMSWs and 1.7% among EMSWs. Among them, nobody was infected with HIV among the 87 participants from bars. The difference was statistically significant in HIV rates among different groups. Overall, 56 tested positive for syphilis: 10/40 from parks, 21/119 from family clubs, and 25/235 from licensed entertainment venues. The differences were statistically significant among these venues.

There was a trend that MSWs working in larger MSW groups were less likely to self-identify as gay or homosexual. PMSWs reported a significantly higher percentage of unprotected anal intercourse with both commercial and non-commercial male partners, and a lower percentage of having a HIV testing history (Table 1).

#### Demographic Characteristics

Among the 394 MSWs enrolled in the study, the average age was 22.8 years, with only 16% older than 25 years (Table 1). Independent PMSWs were significantly older and less educated compared with those working in group venues. In addition, PMSWs generally had lived in Shenzhen for a longer time, and were more likely to live with sexual partners and have other jobs besides engaging in commercial services that involved the selling of sex. A higher proportion of PMSWs and FMSWs came from regions with high HIV prevalence rates, such as Sichuan, Chongqing, Yunnan and Guizhou [21]. MSWs working in larger MSW groups also tended to have higher incomes, including both higher monthly incomes and higher payments from each encounter.

#### Sexual Practices

Sexual behaviors of these MSWs were consistent with their sexual orientation, with a greater proportion of EMSWs and FMSWs having sex with women in the previous 6 months, and having multiple female sexual partners within the same time period compared with PMSWs (Table 1). In contrast, a greater proportion of PMSWs had non-commercial male partners (93%), compared with FMSWs (62%) and EMSWs (54%). Furthermore, PMSWs were twice as likely to practice unprotected anal intercourse with both commercial and non-commercial males,

**Table 1** HIV/syphilis prevalence and relevant characteristics in male sex workers by venue type, Shenzhen, China, 2008

	PMSW (n = 40)		FMSW (n = 119)		EMSW (n = 235)		Total (n = 394)		X <sup>2</sup>	P <sup>a</sup>
	n	%	n	%	n	%	n	%		
Test result										
HIV positive	3	8	13	11	5	2	21	5	14.46	0.001
Syphilis positive	10	25	21	18	25	11	56	14	6.56	0.038
Demographic information										
Age (Years)									11.56	0.021
18–21	12	30	51	43	79	34	142	36		
22–25	20	50	43	36	127	54	190	48		
>25	8	20	25	21	29	12	62	16		
Education level									6.86	0.143
Junior high school or less	16	40	34	29	71	30	121	31		
Senior high school	17	43	72	61	131	56	220	56		
College or higher	7	18	13	11	32	14	52	13		
Hometown									6.61	0.037
High HIV prevalence areas	7	18	25	21	26	11	58	15		
Other areas	33	83	94	79	209	89	336	85		
Length of stay in Shenzhen									28.53	<0.001
≤3 months	2	5	52	44	82	35	136	35		
>3 months	38	95	66	56	152	65	256	65		
Occupational status									74.81	<0.001
Fulltime MSWs	14	35	101	85	197	84	312	79		
Others	26	65	18	15	38	16	82	21		
Monthly income									7.97	0.019
≤1000	14	35	25	21	36	15	75	19		
>1000	26	65	94	79	199	85	319	82		
Self-identified sexual orientation									54.66	<0.001
Homosexual/gay	22	55	37	31	37	16	96	24		
Bisexual	16	40	45	38	87	37	148	38		
Heterosexual or unsure	2	5	37	31	111	47	150	38		
Sexual behavior										
Female sex partner <sup>b</sup>									46.80	<0.001
0	29	73	55	46	61	26	145	37		
1	2	5	27	23	44	19	73	19		
>1	9	23	37	31	130	55	176	45		
Number of non-commercial male partners <sup>b</sup>									53.15	<0.001
0	3	8	44	37	106	45	153	39		
1–2	6	15	36	30	69	29	111	28		
>2	31	78	39	33	60	26	130	33		
Number of male clients, past 1 month									12.59	0.050
≤2	10	25	30	25	56	24	96	24		
3–5	11	28	46	39	62	26	119	30		
6–10	14	35	25	21	66	28	105	27		
>10	5	13	18	15	51	22	74	19		
Payment for selling sex to male clients									12.42	0.002
≤500	33	83	77	65	131	56	241	61		
>500	7	18	42	35	104	44	153	39		

**Table 1** continued

	PMSW (n = 40)		FMSW (n = 119)		EMSW (n = 235)		Total (n = 394)		X <sup>2</sup>	P <sup>a</sup>
	n	%	n	%	n	%	n	%		
Commercial female sex <sup>b</sup>									22.20	<0.001
Yes	5	13	26	22	95	40	126	32		
No	35	88	93	78	140	60	268	68		
Receptive anal intercourse with client <sup>b</sup>									12.69	0.002
Every encounter	14	37	21	18	53	23	88	23		
Not every encounter	24	63	95	82	177	77	296	77		
Duration of sex work									15.05	0.005
<1 year	10	26	30	25	80	35	120	31		
1–3 years	16	42	75	63	114	50	205	53		
>3 years	12	32	14	12	35	15	61	16		
Unprotected anal intercourse (UAI) in commercial male sex <sup>b</sup>									32.56	<0.001
Yes	27	71	29	25	60	26	116	30		
No	11	29	86	75	172	74	269	70		
UAI in non-commercial male sex <sup>b</sup>									33.52	<0.001
Yes	25	63	32	27	54	23	111	28		
No	15	38	87	73	181	77	283	72		
UAVI with female partners <sup>b</sup>									6.09	0.048
Yes	12	30	41	35	111	47	164	42		
No	28	70	78	66	124	53	230	58		
STI, drug use, services and knowledge										
Ever have symptoms of STI									12.84	0.002
No	26	65	105	88	195	83	326	83		
Yes	14	35	14	12	40	17	68	17		
Ever took drugs									5.84	0.054
No	32	80	79	66	150	64	261	66		
Yes	8	20	40	34	85	36	133	34		
Ever drunk alcohol before sex									7.46	0.024
No	9	23	49	41	70	30	128	33		
Yes	31	78	70	59	165	70	266	68		
History of HIV test									12.17	0.016
No	16	40	75	64	131	56	222	57		
Yes	24	61	42	36	104	44	170	44		
Any HIV education and service									5.60	0.062
No	8	20	33	28	40	17	81	21		
Yes	32	80	86	72	195	83	313	79		

<sup>a</sup> Adjusted by recruitment rate at each event considering homogeneity of persons sampled in each VDT

<sup>b</sup> In the past 6 months; *UAI* unprotected anal intercourse, *UAVI* unprotected anal or vaginal intercourse, *STI* sexually transmitted infection

in comparison with agency-based MSWs. On the other hand, EMSWs were more likely to have more than ten commercial male partners in the previous 1 month and to have anal intercourse with such partners than either FMSWs or PMSWs. In addition, EMSWs were more likely to sell sex to women, but had less experience in sex trade (Table 1).

#### Self-Reported STIs, Drug Use, Services and Knowledge

There was a significantly greater proportion of PMSWs reporting ever having symptoms of sexually transmitted infections (STI), as well as having been tested for HIV. PMSWs were less likely to use illegal drugs, while they

had the greatest likelihood of drinking alcohol before having sex in the previous 6 months, doing so at a significantly higher rate than among FMSWs (Table 1).

#### Multivariate Analysis for PMSW vs. EMSW and FMSW vs. EMSW

To further evaluate the determinants for HIV risk from different candidate variables among the different groups, multivariate analysis was conducted as shown in Table 2.

Several key variables determined the MSWs' likelihood of soliciting their clients in a park. They were staying in Shenzhen for a longer time, having other jobs in addition to the sex trade, self-identifying as gay/homosexual, having a larger number of non-commercial male partners in the past 6 months, receiving lower payment in each encounter with a male client, and practicing unprotected anal intercourse with male clients.

Factors, including migrating from a high HIV prevalence area within China, self-identifying as gay/homosexual, having a smaller number of male clients in the past 1 month, and receiving less HIV-related education and services, were found to be the determinants predicting MSWs' likelihood of working in family clubs.

#### Discussion

The study investigated the differences in behaviors/diseases among MSWs working in different venues. Our findings support prior research in other countries [9, 11], which indicated that MSWs in different venues clearly acquired HIV at different rates. Significantly higher HIV and syphilis prevalence among street MSWs (6.9% for HIV and 22.4% for syphilis positive) was observed compared with indoor venue MSWs (4.9 and 13.0%). In addition, a significant difference between FMSWs (11.3 and 17.9% for

HIV and syphilis, respectively) and EMSWs (1.7 and 10.8%) was also found in this study.

Further, the characteristics of MSWs in different venues were compared. Compared with EMSWs, the risk factors for PMSWs included self-identified homosexual orientation, lower income, higher rate of receptive and unprotected anal intercourse, longer experience of selling sex and higher syphilis prevalence. These findings are similar to those reported in other countries [9–11]. FMSWs, on the other hand, only reported a couple of known correlates for HIV infection, including higher proportion of homosexual/gay and fewer female sex partners, fewer clients, and less coverage by HIV services. The lower self-reported coverage of HIV-related services among FMSWs indicated that the current strategy for HIV education and intervention failed to fully cover this particular at-risk subgroup of MSWs. The current HIV services in Shenzhen are mainly based on outreach that provides HIV education, condom distribution, testing and intervention in big venues including bars, massage centers and saunas for the purpose of covering a wider proportion of MSM using limited resources. In parks, only condom distribution and peer education had been applied before the time of this study, while no specific venue-based HIV related services had been provided to the more than 35 small family clubs. The results from this study suggest that further efforts to reduce the HIV risk and prevalence within this sub-population are needed.

The study also showed that a higher proportion of MSWs working in parks or family clubs came from poor regions of China with high HIV prevalence rates among MSMs (>10%) (Table 3) [21]. One explanation for this was that some study participants might have contracted HIV prior to their arrival in Shenzhen. However, among the nine HIV-positive participants from southwest China, four (44%) tested negative within 6 months after their arrival in Shenzhen. Since no significant difference was

**Table 2** A comparison of characteristics for PMSW vs. EMSW and FMSW vs. EMSW

	PMSW AOR <sup>a</sup> (95% CI)	FMSW AOR <sup>a</sup> (95% CI)
Hometown from high HIV prevalent area	2.16(0.40–11.76)	2.10(1.08–4.09)
Length of staying in Shenzhen >3 months	8.17(1.74–38.46)	0.69(0.41–1.15)
Fulltime MSWs	0.064(0.02–0.22)	1.38(0.68–2.79)
Self-identified as:		
Bisexual	0.14(0.04–0.52)	0.48(0.25–0.90)
Heterosexual or unsure	0.02(0.00–0.14)	0.30(0.16–0.59)
>2 non-commercial male sex partners	3.95(1.18–13.21)	1.41(0.78–2.56)
Average payment per encounter >500RMB	0.25(0.07–0.84)	0.61(0.37–1.01)
EMSW served as reference group		
>5 commercial male clients, past 1 month	1.12(0.37–3.34)	0.57(0.34–0.93)
Never received HIV related service	2.73(0.61–12.30)	1.83(1.00–3.34)
Unprotected anal intercourse with male clients	6.60(1.94–22.49)	0.94(0.50–1.76)

<sup>a</sup> Adjusted for other variables listed in the text

**Table 3** Correlation of hometown and HIV risk among MSWs in different venues Shenzhen, China, 2008

	Hometown	HIV n(%)		Adjusted OR (95%CI)
		Negative	Positive	
PMSW	Low prevalence areas	32(97.0)	1(3.0)	20.14(1.83–221.69)
	High prevalence areas	5(71.4)	2(28.6)	
FMSW	Low prevalence areas	87(92.6)	7(7.4)	4.28(1.23–14.82)
	High prevalence areas	19(76.0)	6(24.0)	
EMSW	Low prevalence areas	205(98.1)	4(1.9)	2.03(0.22–18.89)
	High prevalence areas	25(96.2)	1(3.8)	

found in the socioeconomic status of this subgroup of MSWs compared with the others, the higher HIV infection rate could perhaps be explained by the higher proportion of risky behaviors that the MSWs perhaps carried over from their hometowns. Significantly lower rates of condom use with non-commercial partners were found among this group compared with the other groups (19.0 vs. 10.1%,  $P < 0.05$ ). In addition, in Chinese societies, close relationships (networks) tend to form among people from the same hometown (*Laoxiang*) when they migrate to other locations. The close networks, which likely include sexual networks, could be further spreading the virus within this population.

This study has a number of limitations in addition to deficiencies in the representativeness of the cross sectional studies. First, because the population was recruited and sampled in MSM venues by TLS, there was a strong possibility that a sub-group of MSWs who did not go to any physical existing venues would not be recruited. Second, past sexual behaviors, and illicit drug use, may be subject to reporting bias. Finally, the sample size for each type of MSWs was small, especially for PMSWs, which may affect the representativeness of the survey.

This study is the first report comparing HIV prevalence among male sex workers in different venues by using a time location sampling method in China. Besides working on the street, MSWs working in small family clubs are also at higher risk of being infected by HIV compared with those working in entertainment venues. This finding indicated that the ongoing prevention and intervention strategies being executed in entertainment venues is likely effective, and a park and family club-oriented intervention strategy would be urgently needed to provide better health services for MSWs. In addition, based on the fact that most Shenzhen MSWs were internal migrants from other places in China and higher HIV infection was observed in those coming from high HIV prevalent area, special services should be targeted toward this specific subgroup.

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