

SYPHILIS

Commercial sex venues: a closer look at their impact on the syphilis and HIV epidemics among men who have sex with men

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Sex Transm Infect 2006;**82**:439–443. doi: 10.1136/sti.2006.020412

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Accepted for publication 25 July 2006

Objective: To provide insight into the role of commercial sex venues in the spread of syphilis and HIV among men who have sex with men (MSM).

Study: A cross sectional study of 1351 MSM who were diagnosed with early syphilis who did and did not encounter sexual partners at commercial sex venues.

Results: Overall, 26% MSM diagnosed with syphilis had sexual encounters at commercial sex venues. Of these, 74% were HIV positive, 94% reported anonymous sex, and 66% did not use a condom. Compared to those who did not have a sexual encounter at these venues, they were twice as likely to be HIV positive (OR = 1.91, 95% CI 1.36 to 2.68), six times more likely to have anonymous sex (OR = 6.18, 95% CI 3.37 to 11.32), twice as likely not to use condom (OR = 2.02, 95% CI 1.71 to 2.38), and twice as likely to use non-injecting drugs (OR = 1.65, 95% CI 1.21 to 2.37).

Conclusions: MSM diagnosed with syphilis who frequent commercial sex venues are engaging in high risk behaviours for syphilis and HIV transmission and acquisition. Thus commercial sex venues are one of the focal points of syphilis and HIV transmission and acquisition.

The introduction of highly active antiretroviral therapy (HAART) to industrialised countries in late 1996 resulted in an immediate reduction in HIV related morbidity and mortality with dramatic improvement in quality of life for people infected with HIV.¹ Paradoxically, this may well have contributed to changes in the way many men who have sex with men (MSM—includes gay and bisexual men, male to female transgenders, and men who have sex with male to female transgenders) view the consequences of HIV transmission, resulting in an increase in high risk sexual behaviours. Some HIV negative MSM are no longer as fearful of becoming HIV infected and some HIV positive men, believing that they are less likely to transmit the virus, are less concerned with the practice of safe sex.^{2–5} Alcohol and drug use, unrecognised HIV infection, misperception of risk,^{6–8} and the resulting laxity in condom use and safe sexual practices have led to a resurgence of sexually transmitted diseases (STDs) in MSM. Since 1997, syphilis outbreaks among MSM have occurred in US cities—New York, Seattle, Chicago, San Francisco, Los Angeles, and Miami—suggesting a shift away from safer sex behaviours.^{9–14} In each of these outbreaks, high rates of HIV co-infection were documented, ranging from 20% to 73%.

Bathhouses and sex clubs have received a great deal of attention for being sexually charged settings in which MSM find opportunities for sex with anonymous or casual partners and have been associated with unprotected sex and substance use.^{15–18} Therefore it is especially important to understand the role these venues have in the spread of HIV and STDs so that interventions can be tailored and/or marketed to those who frequent these venues. A recent study in Los Angeles found that young MSM who frequent bathhouses and sex clubs were more likely to be HIV positive, have a history of STDs, report more sexual partners, engage in more risk sexual behaviours, and have used drugs or alcohol during their last sexual experience.¹⁹

Although it has been shown that HIV positive MSM are more likely to attend bathhouses and sex clubs than their

HIV negative counterparts,²⁰ little is known of the part these venues play in the spread of syphilis and HIV and how MSM diagnosed with early syphilis who frequent bathhouses and sex clubs differ from those who do not attend these venues in their risk taking behaviours. Here we explored the part commercial sex venues played in the syphilis epidemics in Los Angeles by examining differences in sexual risk behaviours, drug use, and demographic characteristics between MSM diagnosed with syphilis who do and do not report having met their sexual partners at bathhouses and sex clubs during the critical period when syphilis infection probably occurred. We also assessed whether they were also using other venues for the same purpose.

MATERIALS AND METHODS

Data collection and case definition

California law requires that reactive syphilis serological results and suspected cases of syphilis be reported to local health departments.²¹ Public health staff interview all individuals with early syphilis to collect clinical, demographic, and behavioural data and to assure that these people and their partners receive adequate treatment. The demographic data collected included participants' age, race/ethnicity, and self reported HIV status. The behavioural data collected included self reported anal sex, oral sex, anonymous sex, condom use, incarceration, injecting and non-injecting drug use, and location where the patients had met their sex partners during the period in which the patient probably became infected with syphilis.

The study population consists of MSM diagnosed with early syphilis between January 2001 and March 2005 in Los Angeles. Early syphilis consisted of all reported primary, secondary, and early latent syphilis cases. The diagnosis of

Abbreviations: FTA-ABS, fluorescent treponemal antibody absorption; HAART, highly active antiretroviral therapy; MSM, men who have sex with men; STDs, sexually transmitted diseases; TPPA, Treponema pallidum particle agglutination

primary syphilis was made by the presence of one or more painless ulcers at the site of exposure and the demonstration of *Treponema pallidum* in a clinical specimen by dark field, fluorescent antibody tests, or a reactive serological test for syphilis; secondary syphilis was diagnosed by the presence of characteristic dermatological lesions and reactive treponemal test (fluorescent treponemal antibody absorption (FTA-ABS) or *Treponema pallidum* particle agglutination (TPPA) tests), or reactive non-treponemal test (titre >1:4); and early latent syphilis was diagnosed by a reactive non-treponemal test or less than fourfold lower titre from untreated patients exposed to syphilis within the previous 12 months.

The "critical period" is defined as the period during which the patient is likely to have contracted syphilis and during which the patient is most infectious to a subsequent sex partner. This period is dependent on the stage of syphilitic infection. The critical period for primary syphilis is 90 days preceding the onset of symptoms and for secondary syphilis is 6½ months preceding the onset of symptoms. The critical period for early latent syphilis is 1 year before the date of treatment.²²

Data analysis

Data were analysed using SAS statistical package version 8.00 (SAS Institute, Cary, NC, USA). "Having sex" or "meeting sex partner" at bathhouses and sex clubs during the critical

period for syphilis infection was the dependent variable. Various demographic characteristics (age, race and ethnicity, HIV status) and behavioural characteristics (anal insertive, anal receptive, oral sex, anonymous partner, condom use, incarceration, injecting drug use, non-injecting drug use) were the independent variables.

Initial descriptive analyses of all variables provided a basic overview of participants' demographic and behavioural characteristics. Association between demographic and behavioural characteristics with having had sex or meeting a sex partner at commercial sex venues and difference between those who did and did not by age group, race/ethnicity, and behavioural characteristics were evaluated at the 0.05 significance level using χ^2 and Fisher's exact tests.

Logistic regression was used to explore the influence of each independent variable on the dependent variable. Firstly, we considered each independent variable by itself in a single variable model. To determine the potential interaction of demographic characteristics with behavioural variables, we then entered all independent variables simultaneously in a multivariate logistic regression models. Odds ratios (OR) with 95% confidence interval (CI) were calculated to measure the degree of influence of the independent variables on having sex or meeting a sex partner at bathhouses and sex clubs by MSM diagnosed with syphilis at the critical period when infection is more likely to occur.

Table 1 Association of having sex or meeting sex partner at bathhouses and sex clubs with demographic and behavioural characteristics

Demographic characteristics	Total	Had sex or met sex partner at bathhouses and sex clubs†		p Value
		Yes No (%)	No No (%)	
Overall age (years)	1351	346 (25.6)	1005 (74.4)	0.003*
<20	17	0	17 (1.7)	
20–29	271	54 (15.6)	217 (21.6)	
30–39	579	163 (47.1)	416 (41.4)	
40–49	381	109 (31.5)	272 (27.1)	
50+	103	20 (5.9)	83 (8.3)	
Race/ethnicity				0.131
White	636	171 (49.4)	465 (46.3)	
African American	132	25 (7.2)	107 (10.7)	
Hispanic	502	124 (35.8)	378 (37.6)	
Other/mixed	81	26 (7.5)	55 (5.5)	
HIV positive				0.001*
Yes	835	241 (73.9)	593 (63.0)	
No	433	85 (26.1)	348 (37.0)	
Anal insertive sex				0.007*
Yes	1057	285 (86.1)	772 (79.4)	
No	246	46 (13.9)	200 (20.6)	
Anal receptive sex				0.009*
Yes	1026	281 (84.1)	745 (77.4)	
No	271	53 (15.9)	218 (22.6)	
Oral sex				0.069
Yes	1251	327 (97.0)	924 (94.6)	
No	63	10 (3.0)	53 (5.4)	
Anonymous partner				<0.001*
Yes	1044	320 (93.8)	724 (73.9)	
No	276	21 (6.2)	255 (26.1)	
Condom used‡				<0.001*
Yes	701	102 (33.7)	599 (68.1)	
No	482	201 (66.3)	281 (31.9)	
Incarcerated past year				0.250
Yes	53	10 (3.4)	43 (5.0)	
No	1111	288 (96.6)	823 (95.0)	
Injecting drug user				0.148
Yes	30	11 (3.3)	19 (1.9)	
No	1273	319 (96.7)	954 (98.1)	
Non-injecting drug user				<0.001*
Yes	360	118 (36.2)	242 (25.2)	
No	925	208 (63.8)	717 (74.8)	

Totals numbers in each group may differ because of missing data.

*p Value<0.05.

†Had sex or met sex partners during the period when syphilis infection probably occurred (critical period).

‡Condom was used at last intercourse.

Table 2 Determinants of having had sex or met sex partner at bathhouses and sex club†

Variables		Odds ratio (95% CI)	
		Univariate analysis	Multivariate analysis
Demographic			
Age (years)	30–39 v 20–29	1.88 (1.19 to 2.96)*	1.72 (1.06 to 2.80)*
	40–49 v 20–29	1.99 (1.23 to 3.19)*	1.82 (1.08 to 3.07)*
	50+ v 20–29	1.14 (0.56 to 2.31)	1.05 (0.49 to 2.24)
Race/ethnicity	African-American v white	0.64 (0.37 to 1.12)	0.77 (0.43 to 1.39)
	Hispanic v white	0.85 (0.62 to 1.18)	1.06 (0.74 to 1.53)
	Other/mixed v white	1.13 (0.61 to 2.09)	1.26 (0.65 to 2.43)
HIV positive	Yes v no	1.91 (1.36 to 2.68)*	1.69 (1.17 to 2.43)*
Behavioural			
Anal insertive	Yes v no	1.65 (1.09 to 2.52)*	1.60 (1.01 to 2.53)*
Anal receptive	Yes v no	1.57 (1.05 to 2.34)*	1.08 (0.69 to 1.68)
Oral sex	Yes v no	1.56 (0.64 to 3.83)	0.85 (0.32 to 2.28)
Anonymous partners	Yes v no	6.18 (3.37 to 11.32)*	5.37 (2.88 to 10.02)*
Condom use	No v yes	2.02 (1.72 to 2.38)*	1.98 (1.64 to 2.14)*
Incarcerated	Yes v no	0.74 (0.35 to 1.57)	0.78 (0.35 to 1.72)
Injecting drug user	Yes v no	2.22 (0.76 to 6.47)	1.69 (0.56 to 5.10)
Non-injecting drug user	Yes v no	1.65 (1.21 to 2.25)*	1.70 (1.21 to 2.37)*

*p Value<0.05.

†Had sex or met sex partners during the period when syphilis infection probably occurred (critical period).

‡Condom was used at last intercourse.

To assess whether those who had sex or met their sex partners at commercial sex venues also have sex or meet sex partners at other type of venues (bars and clubs, motels, streets, internet, parks, and dancehalls), we used χ^2 and Fisher's exact test of association.

RESULTS

Demographic and behavioural comparison of those who had sex or met sex partners at bathhouses and sex clubs and those who did not is shown in table 1. Of 1351 MSM reported to have syphilis during the study period, 26% (346) had sex or had met their sexual partners at bathhouses and sex clubs. Of these, 74% were HIV positive ($p<0.05$), 94% reported anonymous sex ($p<0.05$), 66% reported not using condom during their sexual encounter ($p<0.05$), 36% reported non-injecting drug use ($p<0.05$), 49% were white, 36% were Hispanics, and 47% were between the age of 30 years and 39 years. Compared to those who did not report having had sex or meeting sex partners at these environments, they more frequently reported as being HIV positive (74% v 63%, $p<0.05$), having sex with an anonymous partner (94% v 74%, $p<0.05$), not using condoms (66% v 32%, $p<0.05$), and not using injecting drugs (36% v 25%, $p<0.05$).

The results of the univariate and multivariate logistic regression analysis of MSM diagnosed with syphilis who had sex or met their sexual partners at bathhouses and sex clubs during the critical period for syphilis infection are presented in table 2. In the univariate model, we found that, MSM diagnosed with syphilis were twice as likely to be HIV positive (OR = 1.91, 95% CI 1.36 to 2.68), six times more likely to have anonymous partners (OR = 6.18, 95% CI 3.37 to 11.32), twice as likely not to use condoms (OR = 2.02, 95% CI 1.72 to 2.38), and twice as likely to use non-injecting drugs (OR = 1.65, 95% CI 1.21 to 2.37).

The results of the multivariate logistic regression analysis of MSM diagnosed with syphilis who had sex or met their sexual partners at bathhouses and sex clubs are also presented in table 2. Variables that were independently associated and statistically significant ($p<0.05$) with having sex or meeting sexual partner at bathhouses and sex clubs among MSM diagnosed with syphilis in Los Angeles were being HIV infected, having anonymous sex, not using a condom, having anal insertive sex, using non-injecting drugs, and being between the age of 30 and 49.

Whether MSM with syphilitic infection who had sex or met their sexual partners at commercial sex venues do also have sex or meet their sexual partners at other venues during the critical period for syphilis infection is shown in table 3. Those who had sex or met their sexual partners at commercial sex venues were less likely to have sex or meet their sexual partners on the street and this interaction was statistically significant ($p<0.05$). They were also more likely to have sex or meet their sexual partners at motels, parks, and through the internet, and less likely to meet them at dancehalls, bars and clubs, although findings were not statistically significant ($p>0.5$).

DISCUSSION

The purpose of this study was to provide insight into the part commercial sex venues play in the spread of syphilis and HIV infection among MSM. It examined differences in demographic and behavioural characteristics of MSM with syphilis infection who had sex or met their sexual partners at commercial sex venues and those who did not during the critical period for syphilis infection. It also assessed whether those who reported using commercial sex venues for sexual encounters were also using other venues for the same purpose.

Similar to other studies, we found that those who had sexual encounters either at commercial sex venues or with those they met at those venues were more likely to be HIV positive, have anonymous and unprotected sex, use stimulant drugs, and practise anal receptive sex than those who did not,^{15 20 23 24} and these results were statistically significant. This might be because the environment of commercial sex venues fosters anonymous sexual expression, limited conversation, and negotiation and cognitive escape that may reduce the feeling of responsibility to disclose HIV status and to protect sexual partners.^{24 25}

The findings of more frequent anonymous sex, condom non-use, non-injecting drug use and HIV infection among MSM with a diagnosis of syphilis who had sexual encounters either at commercial sex venues or with those they met at those venues poses a significant threat for the spread of syphilis and HIV infection defining the role these venues have in the spread of syphilis and HIV infection among MSM who frequent them.

In assessing whether those who reported having sexual encounters at commercial sex venues also frequent other

Table 3 Association of having sex or meeting sex partner at bathhouses and sex clubs with other venues

Other venues	Had sex or met sex partner at bathhouses and sex clubs†		p Value
	Yes No (%)	No No (%)	
Bars and clubs			
Yes	132 (40.0)	434 (43.3)	0.291
No	198 (60.0)	568 (56.7)	
Motels			
Yes	8 (2.6)	21 (2.1)	0.628
No	304 (97.4)	978 (97.9)	
Streets			
Yes	8 (2.6)	73 (7.3)	0.003*
No	301 (97.4)	927 (92.7)	
Internet			
Yes	79 (25.3)	244 (24.5)	0.762
No	233 (74.7)	753 (75.5)	
Parks			
Yes	18 (5.8)	47 (4.7)	0.445
No	294 (94.2)	954 (95.3)	
Dancehalls			
Yes	2 (0.7)	10 (1.0)	0.571
No	307 (99.3)	991 (99.0)	

*p value < 0.05.

†Had sex or met sex partners during the period when syphilis infection probably occurred (critical period).

venues, we found that they were less likely to meet their sexual partners on the streets. This may be explained by the fact that most of them were white and between 30 years and 49 years of age and the financial cost associated with attending a commercial sex venue, most of which require payment of "admission fees," may be less popular for young and minority MSM with less disposable income.²⁶

The results of our study should be viewed in light of the fact that the data are self reported and it is possible that some MSM in our sample, because of self report bias and social stigma, may have been reluctant to report their HIV status and episodes of unprotected sex, drug use, and history of incarceration. We therefore consider our data to provide conservative estimates of the risks for HIV and syphilis transmission and/or acquisition at commercial sex venues and underestimate the role they have in the syphilis and HIV epidemics among MSM in Los Angeles. Moreover, the study sample did not consist of participants randomly selected and those without syphilis diagnosis but MSM with diagnosis of syphilis, which limits generalisation of our findings to other subgroups of MSM and the population in general. Therefore to assess the extent to which our result could be generalised and to better understand the role commercial sex venues are having in the syphilis and HIV epidemics among MSM, complementary community based case-control studies are needed.

Key messages

Compared to those who did not visit commercial sex venues, men who have sex with men (MSM) with the diagnosis of syphilis who had visited commercial sex venues were:

- twice as likely to be HIV co-infected
- six times more likely to have anonymous sex
- half as likely to use condoms
- twice as likely to use non-injecting drugs

Therefore these findings suggest that commercial sex venues are markers for more frequent high risk behaviours and pose a significant threat for the spread of syphilis and HIV among MSM frequenting these venues.

However, despite the potential limitations of this study, several recommendations can be made. (1) HIV and STD prevention interventions tailored to MSM who frequent commercial sex venues is of immediate priority if we are to control the rising HIV and syphilis epidemics in this population. (2) Venue and behavioural specific interventions that foster positive attitudes and social norms for healthy sexual behaviours should be delivered on site. (3) Where possible, environmental barriers that inhibit communications, risk awareness, disclosure of HIV status, and condom use should be addressed. (4) The finding of high prevalence of HIV infection among MSM with syphilis infection who frequent these venues warrants the development and implementation of an integrated approach to HIV, syphilis and other STD prevention at these venues and should employ "prevention for positives" strategies to foster responsibility among HIV positive people to disclose their serostatus. (5) Recreational drug use should be addressed as a component of the integrated public health prevention strategy at these venues.

Finally, we do not believe that our findings provide justification for closing bathhouses and sex clubs, rather we argue that commercial sex venues can be suitable for targeted HIV, syphilis, and other STD prevention interventions. Further research regarding specific determinants of behaviours at these venues is needed to ensure maximum understanding of the public health impact of these environments and to develop appropriate public health interventions.

CONTRIBUTORS

GA conceived, initiated, wrote, and coordinated all aspects of the study; CB and KH contributed to data entry and analysis; LS, MT, and PK contributed to the revision and writing. All authors contributed to writing or commenting on the paper.

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Source of funding: none.

Conflict of interest: none.

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