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# Sex with Women Among Men Who Have Sex with Men in China: Prevalence and Sexual Practices

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## Abstract

Men who have sex with men and women (MSMW) are a potential bridge population for transmitting HIV to heterosexual women. This study assessed key characteristics of this subgroup of men who have sex with men (MSM) in China. Of 1141 eligible MSM, 45.6% reported bisexual behaviors. Besides marriage as a strong predictor (odds ratio: 23.90, 95% confidence interval: 14.29–39.98), older age (1.12, 1.10–1.15) and lower education (or no college education) (1.98, 1.52–2.59) were also independently associated with having ever had sex with women. MSMW reported higher proportions of alcohol drinking, heterosexual/bisexual orientation, and preference for an insertive role in anal sex than men who had sex with men only; but there was no statistically significant difference between two groups in prevalence of HIV and syphilis infections and in history of sexually transmitted infections. HIV prevention intervention programs should break the bridging role of HIV transmission in MSMW population.

## Introduction

Homosexuality has a long history in China, and can be traced with historical evidence back to the Shang dynasty in 1523–1027 BC.[1] Under the influence of Confucianism, male homosexuality fell into official disfavor.[2] Since China adopted its "open door" policy in the late 1970s, Chinese society has become increasingly tolerant of stigmatized sexual behaviors, including extramarital, commercial, and homosexual activities. In the past decade, men who have sex with men (MSM) have become visible;[3] however, homosexual behaviors still carry a stigma in Chinese society and the stigma for MSM is mainly due to social norms against homosexuality, males' responsibility to carry the family line, and their high risks for human immunodeficiency virus (HIV) infections or sexually transmitted infections (STIs).[4,5] Therefore, many MSMs marry women to cover their sexual orientation and fulfill their social and family obligations.

Because HIV prevalence has increased from 0.9% in 2003 to 6.8% in 2011, and syphilis prevalence has fluctuated from 2.4% to 7.8% among Chinese MSM based on national surveillance data,[6] Chinese MSM have become a potential bridge to transmit HIV/STIs from their high risk male sexual partners to their low-risk wives or other female sexual partners.[7] In comparison, HIV prevalence is much lower among Chinese women, (e.g., 0.3% among low-risk pregnant women and 1.5% among high-risk female sexual workers).[8] Therefore, great attention should be given to the mode of HIV/STIs transmission from homosexual men to women. Numerous publications have assessed the prevalence of having female sexual partners among Chinese MSM,[9–13] but there is no study investigating the predictors for bisexual behaviors and comparing the sexual behaviors among those who ever have and those who never have female sexual partners. We conducted this study in the metropolitan city of Beijing, China to evaluate the demographic factors related to the behavior of having had sex with women among Chinese MSM.

## Materials and Methods

### *Study design and population*

We conducted a cross-sectional study among MSM in Beijing during 2010 and 2011. Participants were recruited

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Table 1. Demographic Predictors for Having Female Sexual Partners Among Chinese Men Who Have Sex with Men

| Demographic predictor | Ever having female sexual partners (%) | | Crude OR (95% CI) | Adjusted OR (95% CI) |
|---|---|---|---|---|
| | Yes | No | | |
| All MSM ($n=1141$) | 520 (45.6) | 621 (54.4) | | |
| Ethnicity | | | | |
| Han majority | 494 (95.0) | 580 (93.4) | 1.00 | |
| Other minorities[a] | 26 (5.0) | 41 (6.6) | 0.74 (0.43, 1.27) | NA |
| Ever married | | | | |
| No | 234 (45.0) | 597 (96.1) | 1.00 | |
| Yes | 286 (55.0) | 24 (3.9) | 30.4 (19.3, 49.4) | 23.90 (14.29, 39.98)[b] |
| Education | | | | |
| College or above | 216 (41.5) | 386 (62.3) | 1.00 | 1.00 |
| High school or lower | 304 (58.5) | 234 (37.7) | 2.32 (1.82, 9.67) | 1.98 (1.52, 2.59)[c] |
| Beijing *Hukou* | | | | |
| No | 412 (79.5) | 474 (76.3) | 1.00 | 1.00 |
| Yes | 106 (20.5) | 147 (23.7) | 0.83 (0.62,1.11) | 1.16 (0.86, 1.58)[d] |
| Occupation | | | | |
| Stable | 293 (56.6) | 397 (64.0) | 1.00 | 1.00 |
| Temporary | 147 (28.4) | 104 (16.8) | 1.92 (1.43, 2.57) | 1.32 (0.93,1.86)[e] |
| Retired | 45 (8.7) | 39 (6.3) | 1.56 (0.99,2.46) | 1.11 (0.66, 1.88)[e] |
| Students | 7 (1.3) | 50 (8.1) | 0.20 (0.08,0.42) | 0.54 (0.23,1.26)[e] |
| Others | 26 (5.0) | 30 (4.8) | 1.17 (0.68,2.03) | 1.35 (0.74,2.47)[e] |
| Age (year) | | | | |
| Median (IQR) | 32 (27, 38) | 26 (23, 30) | 1.12 (1.10, 1.15) | NA |

CI, confidence interval; IQR, interquartile range; NA, not applicable (no confounding variables according to the directed acyclic graph analysis); OR, odds ratio.

[a]Other minorities were mainly Man and Hui; [b]adjusted for age, race, education, Beijing *Hukou*, and occupation; [c]adjusted for age, race, Beijing *Hukou*; [d]adjusted for education and occupation; [e]adjusted for age, race, education, and Beijing *Hukou*.

from the community by using mixed sampling approaches, including VCT clinic patients, advertisement on gay websites, outreach to MSM frequented venues (e.g., bars, clubs, bathhouses, and parks), and snowball sampling.[14] We also recruited MSM with known HIV-infected status from other ongoing studies. A total of 1155 MSM were recruited; of them, 242 had known HIV positive status at enrollment. The inclusion criteria were: (1) self-reporting anal sex with men in the past 3 months; (2) age 18 years or older; (3) living in Beijing more than 12 months; (4) able and willing to provide consent. Our study was approved by the institutional review boards of National Center for AIDS/STD Control and Prevention (NCAIDS), the Chinese Center for Disease Control and Prevention (China CDC), and Vanderbilt University School of Medicine.

### Questionnaire interview and laboratory testing

Trained investigators administrated a questionnaire-based interview with each participant to collect data on demographic characteristics, sexual behaviors, drug and alcohol use, and history of STIs.

A blood sample was collected from each participant and tested for HIV and syphilis infections. Enzyme-linked immunosorbent assay (ELISA, Wantai Biological Medicine Company, Beijing, China) and Western blot (HIV Blot 2.2 WB, Genelabs Diagnostics, Singapore) were used for HIV screening and confirmation, respectively. For syphilis, a positive screening test by rapid plasma reagin (RPR, Shanghai Kehua Biotechnology Ltd, Shanghai, China) was confirmed with a *Treponema pallidum* ELISA (TP-ELISA, Beijng Wantai Biological Pharmacy Enterprise Co. Ltd, Beijing, China). We report only confirmed HIV and syphilis infections.

### Statistical analysis

Of 1155 interviewed MSM, 1141 were included in this analysis; 14 participants were excluded due to missing data regarding the outcome variable of ever having had sex with women. The outcome variable was defined as a dichotomous variable, and potential demographic predictors were explored. Confounders for each covariate were identified based on directed acyclic graph (DAG) analysis and biological plausibility.

We compared demographic covariates between men who have sex with men only (MSMO) and MSMW in univariate logistic analyses, and the association between outcome variable, and each demographic predictor was adjusted for specific panels of confounders using multivariable logistic regression models. We compared risky behaviors between MSMW and MSMO using Chi-square tests. HIV and syphilis prevalence were also compared among those with unknown HIV status at enrollment. As marriage could be a strong predictor for bisexual behaviors among MSM in China where gay marriage is not legalized, we also performed subgroup analysis among unmarried MSM. As homogeneity analyses did not detect heterogeneity at a 20% significance level between 242 participants with known HIV-positive status and those with unknown HIV status at enrollment, we combined them in all analyses.

All analyses were conducted using SAS Software (version 9.3, SAS, Cary, NC, USA).

Table 2. Comparison of Risky Behaviors Between Men Who Have Sex with Men (MSM) Who Had and Who Did Not Have Female Sexual Partners in Beijing, China

| | *All MSM* | | | *Unmarried MSM* | | |
|---|---|---|---|---|---|---|
| | *Ever having sex with women in lifetime (%)* | | | *Ever having sex with women in lifetime (%)* | | |
| *Behaviors* | *Yes* | *No* | p *Value* | *Yes* | *No* | p *Value* |
| All MSM ($n=1141$) | 520 (45.6) | 621 (54.4) | | 234 (28.2) | 497 (71.8) | |
| Travelling outside Beijing City during the past 12 months | | | 0.87 | | | 0.52 |
| No | 395 (76.1) | 470 (75.7) | | 171 (73.4) | 451 (75.5) | |
| Yes | 124 (23.9) | 151 (24.3) | | 62 (26.6) | 146 (24.5) | |
| Frequency of alcohol drinking | | | <0.001 | | | <0.001 |
| More than once per week | 163 (31.4) | 102 (16.4) | | 66 (28.3) | 94 (15.8) | |
| Less than once per week | 356 (68.6) | 519 (83.6) | | 167 (71.7) | 503 (84.2) | |
| History of drug use | | | 0.29 | | | <0.001 |
| No | 501 (96.5) | 605 (97.6) | | 221 (94.8) | 582 (97.6) | |
| Yes | 18 (3.5) | 15 (2.4) | | 12 (5.2) | 14 (2.4) | |
| Sexual orientation | | | <0.001 | | | <0.001 |
| Homosexual | 216 (41.9) | 543 (88.9) | | 108 (46.7) | 525 (89.4) | |
| Heterosexual or bisexual | 300 (58.1) | 68 (11.1) | | 123 (53.3) | 62 (10.6) | |
| Sexual role preference when having anal sex with men | | | <0.001 | | | 0.03 |
| Mainly receptive | 129 (26.0) | 229 (37.9) | | 65 (28.4) | 222 (38.1) | |
| Mainly insertive | 240 (48.4) | 241 (39.8) | | 104 (45.4) | 232 (39.8) | |
| Dual | 127 (25.6) | 135 (22.3) | | 60 (26.2) | 129 (22.1) | |
| Ever having commercial sex | | | 0.057 | | | 0.03 |
| No | 485 (93.6) | 593 (96.1) | | 215 (92.3) | 569 (95.9) | |
| Yes | 33 (6.4) | 24 (3.9) | | 18 (7.7) | 24 (4.1) | |
| Ever diagnosed with sexually transmitted infections | | | 0.65 | | | 0.71 |
| No | 350 (69.2) | 419 (70.4) | | 166 (72.4) | 410 (71.2) | |
| Yes | 156 (30.8) | 176 (29.6) | | 63 (27.5) | 166 (28.8) | |
| HIV infection[a] | | | 0.60 | | | 0.98 |
| No | 385 (95.1) | 461 (94.3) | | 172 (94.0) | 442 (94.0) | |
| Yes | 20 (4.9) | 28 (5.7) | | 11 (6.0) | 28 (6.0) | |
| Syphilis infection[a] | | | 0.99 | | | 0.95 |
| No | 337 (83.2) | 407 (83.2) | | 154 (83.7) | 396 (83.9) | |
| Yes | 68 (16.8) | 82 (16.8) | | 30 (16.3) | 76 (16.1) | |

[a]Excluding 242 participants who had been infected with HIV at enrollment.

## Results

### *Demographics*

Of 1141 participants, the median age was 28 years (interquartile range [IQR] 24, 34); the majority were of Han ethnicity (94.1%), never married (72.8%), college educated (52.8%), non-Beijing residents (77.8%), and currently employed (82.7%). Nearly half (45.6%) were MSMW, and the remaining (54.4%) were MSMO.

### *Predictors for having female sexual partners*

Univariate analyses indicated MSMW were more likely to be older or married, and less likely to have college education or be stably employed than MSMO (Table 1). Nighty-two percent of 309 ever married MSM and 28% of 831 single MSM reported ever having sex with women. Being ever married was a strong predicator for having female sexual partners (adjusted odds ratio [aOR]: 23.90; 95% confidence interval [CI]: 14.29, 39.98). MSM without college education were 98% more likely to have sex with women than those with college education (aOR: 1.98; 95% CI: 1.52, 2.59). A 1-year increase of age was associated with a 12% increase in odds of having had sex with a woman (crude OR [cOR]: 1.12; 95% CI: 1.10, 1.15). There was no association between occupation and having had female sexual partners after the adjustment for age, race, education, and Beijing *Hukou* (or household registration).

In the subgroup analysis among unmarried MSM, lower education (aOR: 1.41; 95% CI: 1.00, 1.96) and older age (cOR: 1.02; 95% CI: 0.99, 1.05) remained associated with having had a female sexual partner (not shown in table).

### *Risk behaviors between MSMW and MSMO*

About three-quarters (67.3%) of participants self-identified themselves as homosexuals; 43.7% preferred an insertive role when having anal sex with men, 32.5% preferred a receptive role, and the rest (23.8%) reported a dual role; 28.4% of MSMW reported consistent condom use with female sexual partners. Five percent of participants had a history of commercial sex; over a quarter (27.8%) of participants were frequent alcohol drinkers (more than once peer week); 3% were drug users.

Table 2 shows the comparisons of risk behaviors and HIV and syphilis infections between MSMW and MSMO in the entire and unmarried MSM population. In the entire MSM population, MSMW were more likely to be frequent alcohol drinkers (31.4% vs. 16.4%), to report heterosexual or bisexual orientation (58.1% vs.11.1%), to play an insertive sexual role during anal sex with male sexual partners (48.4% vs. 39.8%), and to report a history of commercial sex ($p = 0.057$). There were no statistical differences between two groups on travelling to other cities, history of drug use, and history of STIs. Among 894 participants with unknown HIV status at enrollment, the overall HIV prevalence was 5.4%, 4.9% among MSMW and 5.7% among MSMO ($p = 0.60$); the prevalence of syphilis among both MSMW and MSMO was 16.8% ($p = 0.99$).

Subgroup analysis among unmarried MSM showed the same pattern of differences in sexual behaviors between MSMW and MSMO as among all MSM participants (Table 2). In addition, unmarried MSMW were more likely to have a history of drug use than unmarried MSMO ($p < 0.001$).

## Discussion

Our study found that over a quarter (27.2%) of Chinese MSM who lived in the capital city of Beijing were married, and nearly half (45.6%) had ever had sex with women. While the latter observation is surely influenced by social response bias in self-reporting, these rates are considerably higher than the aggregate rates from recent two meta-analyses of Chinese studies, which suggested 17% of MSM to be currently married and 26–31% had had female sexual partners.[15,16] Based on published estimates, 70–90% Chinese MSM may eventually get married with societal and parental pressure,[12,17] as Chinese men are expected to get married and have babies to carry on their family lineages and names by the time they are in their late 20s. If a man gets older but has not married, colleagues and friends might also be curious why he is not married and even consider him as abnormal. Due to these social and family pressures, many MSM eventually choose to marry a woman and have a baby; they use the marriage as a sort of disguise, fulfilling their perceived social obligation and avoiding stigma.[18]

Fewer MSM are married to women in Western countries, ranging from an estimated 1.5–6%.[19–21] Though there is also stigma in homosexuality in Western countries, homosexuality is more open after decades of the gay human right movements, even leading to legalization of same-sex marriage in some countries.[22] In addition, we speculate that people in Western, higher-income countries have more privacy in their social lives, and therefore are less likely to be exposed to social pressure because of their sexual orientation. Lower marriage-to-women rates, then, may reflect greater MSM self-efficacy and choice, including whether to marry a woman or have children.

One significant social consequence of marrying a woman by a homosexual man is an unhappy marriage for both partners. An estimated 16 million Chinese MSM are married.[23] In most cases, married MSM do not disclose their sexual orientations to their wives, but their relative sexual indifference and infidelity cause tremendous psychological trauma to their wives, as now reported in the Chinese mass media. Another consequence is putting the wives or other female sexual partners of MSMs at risk of HIV and STIs.[24] Many Chinese MSM have unstable sexual relationships with male partners and have more lifetime sexual partners than heterosexual men.[25] Penile–anal intercourse also likely poses a higher biological risk of disease transmission than penile–vaginal intercourse.[26]

We found older MSM were more likely to have ever had sex with women and a possible explanation is that as Chinese men were getting older, they might face more pressure from society and family to marry and have female sexual partners than younger men. Another possible reason is part of generational pressure that affects older people more than younger people, as being MSM is becoming less stigmatized over time. We also found that less educated MSM were more likely to have female sexual partners, and a possible reason is that they tended to be subjected to influence of traditional social norms.

We are interested in any difference in HIV-related behaviors and disease rates among MSM who have and do not have female sexual partners. Our study showed difference in several behaviors, such as alcohol drinking and sexual role preference, but no difference in prevalence of HIV and syphilis infections.

Our study has limitations. Our study participants were recruited using mixed approaches; therefore they were a convenience sample. The primary outcome of having female sexual partners was based on self-reporting; therefore we could not exclude the possibility of information bias. However, our finding on bisexual behaviors among Chinese MSM is consistent with the literature.

In conclusion, our study primarily characterized MSMW features, and provided valuable information for future intervention. Public health workers and policymakers in China and elsewhere around the world should consider the risk of MSM in translating HIV/STIs from their high-risk male sexual partners to their low-risk wives or other female sexual partners, particularly given the low rates of condom use in within-marriage or steady-partner sex.[27]

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## Author Disclosure Statement

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