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Men Who Have Sex with Men and Human Immunodeficiency Virus/ Sexually Transmitted Disease Control in China

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Abstract

Objectives: To address the role of men who have sex with men (MSM) in the human immunodeficiency virus (HIV)/sexually transmitted disease (STD) epidemic in China.

Goal: To explore the prevalence of risky sexual behaviors and the existing prevention efforts among men who have sex with men (MSM) in China.

Study Design: Review of behavioral and STD/HIV prevention studies addressing MSM in China.

Results: Sexual risk behaviors including unprotected group sex, anal sex, casual sex, and commercial sex were prevalent among Chinese MSM. Many Chinese MSM also engaged in unprotected sex with both men and women. Most MSM either did not perceive that they were at risk of HIV/AIDS or underestimated their risk of infection. Surveillance and intervention research among these men are still in the preliminary stages.

Conclusions: Chinese MSM are at risk for HIV/STD infection and potential transmission of HIV to the general population. In addition to sexual risk reduction among MSM, reduction of homosexualityrelated stigma should be part of effective intervention efforts. Volunteers from the MSM community and health care workers in primary health care system may serve as valuable resources for HIV/STD prevention and control among MSM.

MEN WHO HAVE SEX WITH men (MSM) are at high risk of human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) transmission because of risk behaviors such as multiple partners and unprotected anal intercourse. Globally, around 5%-10% of all HIV/AIDS infections are transmitted via male homosexual behaviors.[1] There are differences in the frequencies of the various transmission modes in different countries, but unprotected homosexual behavior continues to be one of the primary modes of HIV/AIDS transmission worldwide. In many developed countries/regions, such as in North America, Western Europe, and Australia, nearly 70% of infections have been among homosexuals.[1] However, limited data are available in many developing countries, including China, regarding the seropositive rates and sexual risk behaviors among MSM population.

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MSM in China

Although male homosexuality can be traced back several thousand years in China, it has received increased attention in recent years as a result of the rapid growth of the AIDS epidemic in China. An estimated 2% to 5% of male Chinese adults are homosexual/bisexual.[2] MSM reside throughout China in both urban and rural areas that vary in geography, size, economy, culture, and level of economic development, but most of the known MSM population resides in the major metropolitan areas. Public awareness of MSM has increased in recent years in China. Homosexual bars, saunas, and baths are increasingly common in many metropolitan and large Chinese cities. Popular MSM gathering places including public toilets, gardens, and parks also exist, with knowledge of their presence more widespread. Currently, 200 to 300 MSM-oriented websites are available in China. Even major commercial websites like Netease and Sina include information about MSM.[3] These meeting places and websites provide an environment for MSMs living in China to meet and be supported by other MSM. However, some of these sites also promote homosexual prostitution, erotic activity, and the practice of unprotected sex.[3]

Historically, China has not experienced wide-scale persecution of MSM, nor have laws forbidding or punishing MSM been enacted. However, under the strong influence of Confucian and Taoist philosophy, Chinese society emphasizes procreation and social order[4] and therefore stigmatizes homosexual behavior. Under societal and family pressure, most MSM fear revealing their true sexual orientation. Many Chinese MSM have married women and have a sexual relationship with their wives while maintaining a concurrent secret homosexual relationship.[2]

Following the implementation of the “open-door” policy in China in the 1970s and the economic reforms of the middle of 1980s, beliefs and attitudes in Chinese society toward sexuality (including homosexuality) have been changing.[5] With the introduction and rapid development of a market economy and the wide exchange between Western and Chinese cultures, personal freedom, private life, and individuals’ rights are receiving more attention in Chinese society. Greater numbers of individuals are considering sex to be a private matter and hold a more tolerant or favorable attitude toward various sexual practices, including homosexuality.[4,6] *The China Psychiatrics Classification and Diagnostic Criteria*, Version 3, excluded homosexuality as a psychosis in April 20, 2001, indicating that homosexuality is no longer regarded as pathologic. Homosexuality had been declassified as a psychosis in the US 28 years earlier; the World Health Organization (WHO) had deleted homosexuality from the “Psychiatric and Behavioral Disorders” of the *International Statistical Classification of Diseases, 10th Revision* (ICD-10) 9 years earlier.[7,8]

When *The China Psychiatrics Classification and Diagnostic Criteria*, Version 3, was revised, a survey was conducted regarding public attitudes toward MSM among 500 health care providers and 300 college students.[9] More than two-thirds (77.2%) of the health care providers and 86% of students in the survey thought that homosexual individuals deserved sympathy and understanding.[9] In recent years, the Chinese mass media has increasingly portrayed MSM in an objective and impartial manner. MSM have been interviewed on TV in an attempt to help the public deepen their understanding of homosexuality. As societal tolerance toward MSM increases in China, MSM have begun to increase their participation and public appearance in social and cultural events.

STD/HIV Epidemic and Surveillance System in China

STDs reemerged in mainland China in the late 1970s, and since 1988, STDs have been reported in all Chinese provinces.[10] In 2003, about 730,000 episodes of STDs were reported nationwide.

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[11] Experts estimate the actual number to be 5 to 10 times higher than the reported cases. No data exist about the proportion of MSM among these reported cases.

An STD surveillance system was established in 16 cities in 1987 to monitor the STD epidemic in China. The system includes STD regional (sentinel) surveillance, case reporting, *Neisseria gonorrhoeae* resistance surveillance, and behavioral survey. In 1988, a national STD reporting system was launched and has since become the standard surveillance system. STD surveillance sites have increased from 16 in 1987 to 105 in 2003, but surveillance work has not focused on the MSM population, and no surveillance data on STD infection among MSM are available. [12]

Although intravenous drug use remains the main route for HIV transmission, the proportion of HIV infection from sexual transmission is on the rise in coastal cities and some inland cities, increasing in frequency from 2002 to 2003 by 23.3%. It is estimated that among the 840,000 Chinese people currently living with HIV, 11% (or 90,000) are MSM.[13]

Since 1995 when the first 42 sentinel sites were established, China's national HIV/AIDS sentinel surveillance has been limited to 5 at-risk groups, including STD patients, female sex workers, drug users, long-distance truck drivers, and pregnant women.[14] It was not until 2003, when there were 194 sentinel sites nationwide, that the first sentinel site targeting MSM was established. In 2004, the surveillance sites increased to 247, but the number of MSM sites remained at 1.[15] One hundred seventy-three MSM were screened at this single MSM national sentinel site in 2003, revealing an HIV infection rate of 1.2% (n = 2). Behavioral surveillance among MSM in China is extremely limited, with only a single AIDS behavioral surveillance study of MSM having been conducted to date (China-UK AIDS Care Project in Sichuan in 2003, Table 1).[16]

Purpose of the Study

Available statistics indicate that the AIDS epidemic in China is a serious problem. However, surveillance among the high-risk MSM population is preliminary and limited. Furthermore, there are limited data in the scientific literature regarding the sexual risk behaviors and prevention intervention efforts among MSM in China. Therefore, we conducted this review to (1) identify the risk of HIV transmission among MSM and from MSM to the general population in China; (2) assess the existing resources and identify the gaps between the epidemic and prevention needs; and (3) offer recommendations for future HIV/STD control in this high-risk population.

Methods

Published and unpublished reports in the past 15 years (1990-2004) relevant to MSM in China served as resource for the review. A Chinese literature search was conducted using the China Hospital Knowledge Database (chkd) of the China Hospital Digital Library (http://www.chkd.chki.net), and the China Journal Fulltext Database (http://www.cnki.net) (the largest continuously updated Chinese full-text journal database in the world). The key words (in Chinese) were *MSM, homosexuality, AIDS*, and *STD*. English-literature searches were conducted in PubMed. The key words were *MSM, gay, AIDS, HIV, prevention, homosexual, bisexual*, and *STD*. Because of the scarcity of published literature regarding Chinese MSM and the concern of publication bias, we also included unpublished reports from government or research projects (in either Chinese or English), based on the authors' knowledge and research networks.

Original studies relevant to behavior and prevention/intervention among Chinese MSM were reviewed and summarized. Since most studies among MSM were conducted among

convenience samples and may not provide representative data, we have provided herein information on the study design and sample characteristics to enable adequate assessment of the quality of the data. Studies in Hong Kong were not included in this paper because the health care system in Hong Kong is significantly different from that throughout the rest of China.

Results

Sexual Risks of MSM in China

As early as in 1993, a Chinese sociologist studied HIV-related risk behavior among 165 MSM from public settings in Beijing and 3 other cities. The results showed that one-third of MSM had had at least 1 female sexual partner in the past year; one-half had engaged in anal sex; one-sixth had contracted at least 1 STD; only two-fifths had ever used a condom; and one-third acknowledged that they were at high risk for HIV infection.[17]

Since 1997, researchers from Qingdao and Beijing have conducted behavioral surveys among MSM across the country using mailing surveys and face-to-face interviews. Most of the MSM participating in the surveys resided in large or midsized cities and were well educated. They met most of their sexual partners in parks, public lavatories, bars, friends' homes, public baths, or dance halls. A summary of studies concerning sexual behaviors among MSM is presented in Table 2.[16,18-34] Most MSM had multiple sexual partners of both genders. The median number of male partners was 10, and that of female partners was 1. About half (range, 24%-67%) of the MSM had sex with a woman, and one-third (range, 15%-44%) had been married to a woman. Oral and anal sex was common among MSM. Approximately 18%-38% reported having engaged in group sex. More than 10% reported involvement in buying or selling sex. Condom use rate was low, with reported rates of "always use" ranging from 0.5% to 14%. Many MSM reported never using a condom during sex (ranged from 22% to 65%). Self-reported history of STD was high, ranging from 18% to 31%. A study among 729 MSM from 30 provinces of China in 1999 found that of 62 MSM who had undergone HIV testing, 11 were HIV positive.[21]

Older MSM tended to have a higher HIV infection rate. A study among 481 MSM aged 18 to 69 years reported an overall infection rate of 3.1%.[27] However, the infection rate was 12.1% among MSM 40 years or older, compared to 2.5% among MSM younger than 40 years of age. Older MSM were also more likely to have been married. Sixty-four percent of the older MSM were married, while only 11% of MSM younger than 40 were married.[27]

MSM who frequented public places to find sexual partners appeared to be at higher risk of HIV/STD infection. Compared to those who did not seek sexual partners in public places, MSM who did so had more male sexual partners (56 versus 16) in the previous year; were more sexually promiscuous (54.6% versus 28.7%); showed higher rates of being penetrating partners (31.1% versus 17.4%); were more likely to have been victims of sexual abuse (27.6% versus 18.2%), and were more likely to have sex with older MSM (30% versus 14.5%). However, no significant difference was found in the rates of condom use during anal intercourse (50.1% versus 49.3%).[35]

Compared to MSM who had casual male partners, most MSM who had stable sexual partners were young or middle-aged, well-educated, white-collar professionals living in large or mid-sized cities. There were no significant differences in STD rates and risk behaviors between the 2 groups. A significant number of men from both groups were married or were planning to be married.

Although most of the MSM could correctly identify major routes of HIV infection/transmission,[26] only a small proportion believed that they were likely to be infected. A cross-

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sectional survey of 215 MSM in a bar in northeast China found that 52.8% denied they were at higher risk of contracting HIV, 34.1% reported having a low risk, and only 3.7% perceived themselves at a high risk. The belief that they were unlikely to get infected was one of the main reasons for not accessing HIV testing or for not using a condom.[29]

HIV/STD Intervention Among MSM

The intervention prevention efforts targeting MSM in China are minimal and were mostly initiated by volunteers from within the MSM community. In some large Chinese cities, well-educated MSM self-organized in the late 1990s to offer counseling and intervention services. An MSM hotline, supported by MSM volunteers, was set up in Beijing in 1997 to answer calls from MSMs from all of China's 30 provinces, except Tibet. Hotline personnel listened to complaints from MSM, offered support, and promoted safe sex and a healthy lifestyle. In addition to telephone counseling, the hotline organized team sports among MSM and carried out various health promotion and intervention activities in cooperation with local health departments and nongovernmental organizations (NGOs). Such hotlines have been established and staffed by MSM volunteers in Nanjing, Shenyang, Harbin, Dalian, Guangzhou, Chongqing, Qingdao, Shanghai, and Chengdu. These grassroots activities have gained extensive cooperation from international and local AIDS prevention agencies in 2004. However, no evaluation of the effectiveness of these grassroots programs has been performed so far.

A health promotion project exclusively targeting MSM, consisting mainly of an MSM-oriented newsletter, *Friend Communication*, and hotline counseling, was launched by the Sex Health Center, Qingdao Medical College, in 1998.[36-38] The project focuses on the distribution of health promotion materials, in conjunction with hotline counseling by volunteers. The contents of health promotion materials include 4 components: (1) STD/AIDS-related knowledge; (2) information about MSM in biology, psychology, sociology, and ethnicity; (3) debate and discussion articles; and (4) life experiences of MSMs. The *Friend Communication* newsletter is published bimonthly, 6000 copies per issue, and direct-mailed free of charge to 1600 MSM nationwide. Copies are also available at MSM-oriented venues in 20 cities. One thousand copies of each issue are also mailed to health care and counseling professionals and to media organizations. Preliminary evaluation (Table 3) of the impact of the *Friend Communication* suggests that, while persistent and intensive outreach efforts such as newsletters might be beneficial to the MSM population, a short-term, knowledge-based HIV/AIDS intervention for MSM may not be sufficient to promote changes in their risky sexual behaviors.[36-38] In addition, validity of these evaluation studies was compromised by weaknesses of the research methodology, including sampling and measurements.

In 2002, a multimodular HIV/AIDS intervention project for MSM was implemented in Chengdu, Sichuan Province, with support from the China-UK AIDS Care Project.[39] The project, initiated and organized by volunteers (peer-educators) from the MSM community, promoted safe sex among MSM through community-based care, hotlines, peer education, health promotion, and culture building. The results of this 1-year intervention program showed that among the 3158 MSM who participated in some intervention activities, consistent condom use increased from 3% to 14% during the first 6 months and further increased to 28% by 12 months. This was one of the few projects initiated by MSM themselves which provided intervention activities across cultural, health, and social domains. The main factors that contributed to the feasibility and effectiveness of the Chengdu project include the participation of well-organized and committed MSM at a community level, qualified volunteers, professional guidance by HIV/AIDS prevention workers, and an adequate organizational structure including sufficient funding.[39]

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Since 2004, surveillance and intervention work among MSM in China has gained support from the WHO and the Global AIDS Project of the United States CDC, both of which have sought to sustain and standardize intervention work among the MSM in China. Special community-level clinics serving the MSM population were established in Shenzhen and Chengdu in 2004. Specially trained health care providers at these clinics provided a range of medical services and also delivered STD/HIV behavior intervention to the MSM community.

Discussion

Sexual Risk for Infection and Transmission

Chinese MSM are at great risk for HIV/AIDS infection. Two studies with HIV testing suggest an infection rate of 1.3% and 3.1%, respectively,[27,28] which are close to the prevalence rates reported among male patients attending STD clinics.[27] Surveillance data among MSM also revealed an HIV infection rate of 1.2%. Although this rate is lower than the rates among injection drug users and illegal blood/plasma donors in the same year, it is higher than the rates among other risk populations in China, such as female sex workers (with an average infection rate of 0.88%), and STD patients (0.24%).[14] Consistent with the experience in other countries, risky sexual behaviors are common among Chinese MSM. Despite the fact that most MSM had a fairly high level of knowledge of the routes of HIV infection and transmission, they continued to engage frequently in high-risk sexual behaviors, including multiple sexual partners, unprotected anal or oral sex, group sex, casual sex, and commercial sex. Condom use rate was low during these sexual activities. Further, most of the MSM either do not perceive that they are vulnerable to HIV/AIDS or severely underestimate their risk of infection.

Approximately one-half of Chinese MSM reported also having sex with a woman; one-third had been married to a woman. A similar high prevalence of marriage and sexual relationship with women has been reported among MSM in India, Indonesia, and Peru.[30,40,41] The high rates of marriage to a woman and having both female and male sexual partners concurrently among Chinese MSM might be due to the pressure from society and family. Traditional Chinese sexual culture focuses on procreation; no offspring (especially sons) has been viewed as the most undutiful act. Chinese MSM might engage in heterosexual behaviors to avoid societal and family pressures. This common sexual practice among MSM in China increases the probability of HIV/AIDS spreading from MSM to their female partners and, further, to the general Chinese population. This transmission pattern has been observed in black communities in the United States, where dramatic increases of HIV incidence rates have been documented for black MSM and women.[42] Social pressures of establishing a family and maintaining masculinity were identified as powerful social factors leading to bisexual engagements and secret nonheterosexual preferences and practices among black MSM.[42] HIV prevention efforts targeting MSM should not only focus on individual behaviors but also skills dealing with the pressures of conforming to social and sexual norms. In addition, efforts to reduce stigmatizing perceptions about MSM among the general population should be included in intervention efforts.

Limitations and Future Needs

Several significant gaps exist between the growing HIV epidemic and the prevention efforts in China, which include surveillance, research, policy, and training of both volunteers and health care professionals. Based on the literature review, we have identified the following areas as critical for successful HIV prevention efforts among MSM in China.

1. *Strategies and Policies.* Systematic, standardized, and sustainable intervention work among MSM will require both government and societal support in policy, organization, funding, and guidance. The Chinese national government has recently recognized the magnitude of the HIV/AIDS epidemic and is increasingly placing a

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higher value on the prevention and control of HIV.[14] Government at each level is gradually strengthening its efforts in HIV/AIDS intervention targeting high-risk groups. Harm-reduction and prevention strategies that have previously proven to be effective in other countries are now being implemented or pilot-tested in China. These strategies include methadone replacement, free needle exchange, and 100% condom use in entertainment establishments. AIDS prevention in MSM has also received increasing attention from the government.

However, programs and policies to control AIDS among MSM are lacking, which makes it difficult for health care professionals to obtain governmental support and prevents volunteers from participating in AIDS control. This deficiency continues to impede STD and AIDS prevention among MSM.

Policy makers must recognize the high-risk nature of MSM sexual behavior, the importance of AIDS prevention in this group, and its impact on AIDS control throughout China. The grassroots network established by the MSM community and peer education efforts should be given reliable financial, social, and legislative support. Health care professionals should be encouraged to provide continuous technical support and training. Multisector cooperation should be established at the societal level to fight against STD and AIDS.

2. *Surveillance and Research.* HIV-related studies among MSM are limited and biased, and prevention efforts among them are significantly weaker than those among other high-risk groups. The limited data generated at China's sole MSM surveillance site cannot provide an accurate estimate or assessment of HIV infection and HIV risk among MSM in China, which further inhibits effective intervention for this population.

   Most MSM participating in the existing surveillance and healthpromotion activities were from large or medium-sized cites and were well educated. Little is known about the life and HIV risk of MSM in rural areas, where more than 70% of the Chinese population resides. In addition, there are no data available regarding HIV risk of MSM among military personnel, prisoners, college students, and rural-to-urban migrants. Most of the existing intervention studies have numerous methodological weaknesses, and their generalizability is questionable. Emphases of existing intervention programs have largely concentrated on health education and outreach.

   Systematic surveillance of HIV/AIDS/STD among MSM needs to be greatly strengthened. More sentinel sites targeting MSM should be established across the country, especially in the rural areas. Specific behavioral survey and qualitative studies among MSM may be more helpful in exploring the risks for infection and social and cultural context of the risk behaviors of MSMs. Theory-driven and culturally appropriate intervention programs targeting MSM need to be developed and tested using rigorous research methodology.

3. *Volunteer Support.* Many well-educated, responsible MSM are interested in combating the AIDS epidemic and actively cooperate with governmental organizations and NGOs. This attitude greatly enhances the strength of the MSM community over other high-risk groups in preventing the spread of HIV/AIDS. China should use this positive attitude to further mobilize, encourage, and empower the MSM community to take responsibility for AIDS prevention among MSM. The enthusiasm of the volunteers to participate should also be nurtured by identifying them as important members of the team. In this way, a large, stable, high-quality volunteer team can be maintained, with regular training and adequate funding. This is a cost-effective approach for AIDS prevention among MSM, as has been confirmed by the experience in the United States and Australia.[43,44]

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4. *Professional Support.* Training should be provided for health care professionals and public health workers on communicating with MSM, promoting safe sex, and eliminating discriminatory practices. Specialized STD/HIV clinics for MSM should be established to provide counseling, diagnosis, and treatment in a manner that will meet the unique needs of MSM. In rural areas with limited mass media coverage and limited availability of well-trained volunteers, health care workers at the primary health care system (including the county hospitals, township health centers, and village doctors) should be trained to meet the local needs of HIV/STD control and prevention.

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TABLE 1

AIDS Behavioral Surveillance in MSM by the China-UK AIDS Care Project in Sichuan, 2003*[16]

Items	Results
Sample size	576
Average age	28.1 years
History of marriage	29.5%
Sexual behaviors	
Female partners	24%
History of anal sex	83.9%
History of oral sex	82.6%
Percent of condom use in anal sex with regular partners in previous 6 months	15.8%
Percent of condom use at last episode of anal sex with regular partner	36.3%
Percent of condom use in anal sex with irregular partners in previous 6 months	16.3%
Percent of condom use at last episode of anal sex with irregular partner	31.6%
Percent of condom use in anal sex with commercial partners in previous 6 months	32.3%
Percent of condom use at last episode of anal sex with commercial partner	47.4%
Percent of intravenous drug use in previous year	1.9%
Percent of voluntary AIDS test in previous year	18.3%
AIDS-related knowledge	
Refusal to engage in anal sex could prevent HIV	78.6%
Persistent condom use could prevent HIV	74.4%
Lubrication alone cannot prevent HIV	88.3%
Self-evaluation of HIV risk	
No possibility	31.4%
Weak possibility	61.3%
Strong possibility	6.6%
Very strong possibility	0.5%

*Source of sample: bar/public bath, Internet/hotline, park/lavatory (20% sampling for each category).

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TABLE 2

A Summary of Behavioral Study Among MSM in China

Source	Study Year/ Site/ Design	Sample	No. and Type of Partner	Sexual Practice	Condom Use	HIV or STD Infection	Comments
Zhang, 2001 [18, 19]	1997.8-1998.3; 31 provinces and cities of China; cross-sectional survey; convenience sample	N = 426 Age: 31 years (17 years-78 years); Married: 37.8%; Educ.:>12 grades: 63.4%; From city: 89.6%	Median # lifetime partners: 9; Median # partners last year: 3; Median # lifetime female partner: 1;≥1 lifetime female partner: 48.4%	Oral-genital sex: 93.4%; Anal sex: 63.6%; Oral-anal sex: 41.0%; Bought sex: 12.7%; Sold sex: 4.9%; Group sex: 18.1%; During last year: casual sex: 43.7%; bought sex: 7.5%; sold sex: 3.0%	Never: 65.3%; Always: 0.5%	STD among 302 responded: lifetime: 25.5%; last year: 6.8%; 40 had ever tested HIV, and 1 was positive	
Zhang, 2001 [21]	1999; 30 provinces and cities of China; cross-sectional survey; convenience sample	N = 729 Age: 31 years (SD 7.8); Married: 38.2%; Han ethnicity: 96%; Educ.:< 12 grades: 59.2%; From city:≥66.1%	Median # lifetime partners: 10; Median # partners last year: 4; ≥1 lifetime female partner: 52.4%;≥1 female partner last year: 29%	Oral sex: 84.9%; Anal sex: 75.7%; During last year: casual sex: 63.6%; bought sex: 3.8%; sold sex: 9.3%	Never: 36.2%	Self-report STD: lifetime: 18.2%; 62 had ever tested HIV, and 11 were positive	Mail 1800 questionnaires, return 729 (40.5%)
Shi, 2003 [22]	2000; 30 provinces and cities of China; cross-sectional survey; convenience sample	N = 857 Age: 32 years (19 years-65 years); Married: 40.1%; Educ.: >12 grades: 62.1%; From city: 72.5%;	N/A	During last year: casual sex: 65.0%; group sex: 37.8%	Never: 22.5%	Self-report STD: Lifetime: 21.2%; Last year: 6.8%	NA
Li, 2001 [23]	Year: n/a; 31 provinces and cities of China; cross-sectional survey; convenience sample	N = 337 Age: 31 years (17 years-78 years); Married: 32.3%; Education: 65.3%; From city: 20.5%	Mean # lifetime male partners: For MSM w. STD: 19; For MSM w. no STD: 10; Mean # lifetime female partners: For MSM w. STD: 6; For MSM w. no STD: 1	Oral sex: 89.0%; Anal sex: 67.7%; Oral-anal sex: 44.2%; Casual sex last year: 43.9%; Unfaithful male partner: 33.5%; Bought sex from men: 40/337; Sold sex to men: 18/337; Group sex: 18.6%;	Ever use: w. men: 38.4%; w. women: 40.7%	Self-report STD: 25.8%	NA
Zhang, 2002 [24, 31,32]	2001.5-9 30 provinces and cities of China; cross-sectional survey; convenience sample	N = 1109 Age: 33 years (SD 9.7); Married: 44.2%; Educ.: >12 grades: 56.0%; From city: 75.3%	Median # lifetime male partners: 10; Median # male partners last year: 6; Median # lifetime female partners: 3;≥1 female partners lifetime: 50.4%	Oral sex: 93.8%; Anal sex: 79.5%; Bought sex: 13.8%; Sold sex: 5.9%; Group sex: 37.4%; During last year: casual sex: 82.0%; bought sex: 8.3%; sold sex: 3.0%; group sex: 18.5%	Never use: w. men: 39%	Self-report STD: Lifetime: 22.6%; Last year: 11.4%; 110 had ever tested HIV, and 6 (5.4%) were positive	Mail 2900 questionnaires, return 1124, valid 1109 (38.2%)
Zhang, 2003 [25]	2001; 31 provinces and cities of China; cross-sectional survey; convenience sample	N = 689 Age: 34 (SD: 10); Married: n/a; Educ.: >12 grades: 57.1%; From city: 94.1%	Median # lifetime male partners: 12; Median # male partner last year: 3; Median # lifetime female partners: 1; 1 female partner last year: 53.1%	Casual sex last year: 53.7%; Oral sex: 92.4%; Anal sex: 82.9%	Ever use: w. men: 66.2%;	Self-report STD: 26.9%; 69 had HIV test, and 3 were positive Never use last year: w. women 58.1%	Mail 2900 questionnaires, return 1124, 1109 valid; 689 (62.1%) with stable male partner included
Liu, 2001 [26]	2000.8-10; Beijing; cross-sectional survey; convenience sample	N = 84 Age: 30.1 years (SD 9.5); Married: 33.4%; Educ.: >12 grades: 79.8%; Beijing local: 81%	# Lifetime female partners:1-10 partners: 50.0%; 11-20 partners: 2.4%; >20 partners: 1.2%; # Lifetime male partners: 1-10 partners: 50%; 11-20	Oral sex: 100%; Anal sex: 100%; Vaginal sex: 100%	Never use w. men: Oral sex: 82%; Anal sex: 22%	Self-report STD: 23.8%; 11 had ever tested HIV, and 1 was positive	Send out 100 questionnaires; 84 valid questionnaires returned

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Source	Study Year/ Site/ Design	Sample	No. and Type of Partner	Sexual Practice	Condom Use	HIV or STD Infection	Comments
Choi, 2003 [27,30]	2001.9-2002.1; Beijing; cross-sectional survey; convenience sample	N = 482 Age: 18-39 years: 93.1%; Married: 15%; Educ.: >12 grades: 41.4%; Beijing local: 35.1%	partners: 17.9%; 21-50 partners: 14.3%; 51 partners: 17.9%; ≥1 lifetime female partner: 53.8% # Lifetime male partners: 1-20 partners: 73%; 21 +partners: 25.5%; ≥1 lifetime female partner: 63.9%	In the last 6 months: Unsafe anal sex w. men: 49%; Unsafe sex w. women: 22%		Self-report STD: 22.7%; HIV : 3.1% (15/ 481)	501 Men screened, 489 eligible, and 482 provided informed consent
Qu, 2002 [28,29]	2001.11-12; A northeast city in China; cross-sectional survey; convenience sample;	N = 215 Age: 29 years (16 years-67 years); Married: 35.8%; Educ.: >12 grades: 42.7%;	# Female partner last 6 months: 0 partners: 28.2%; 1-5 partners: 47.4%; 6-10 partners: 7.5%; 11+partners: 12.3%; # male partner last 6 months: 0 partners: 0%; 1-10 partners: 31.9%; 11-20 partners: 23.3%; 21-50 partners: 13,1%; 51 partners: 28.7%; ≥1 lifetime female partner: 67.1%; ≥1 female partner last 6 months: 40.5%	In the last 6 months: Anal sex: 89.9%; Sold sex: 26.3%; Sold sex to women: 10.7% (6/56); Sold sex to men and women: 10.7% (6/56); Bought sex: 23.0%; Bought sex from men: 85.7% (42/49); Bought sex from women: 14.3% (7/49)	Never use last 6 months: Commercial sex: 53.5%; Always use 14.0%	Self-report STD: 31.9%; 25 had ever tested HIV, and no one was positive; Urine test HIV : 1.3%	Only 153 urine specimens were drawn and tested for HIV
Wang, 2004 [33,34]	2001.8-11 Cross-sectional survey; convenience sample	N = 353 Mean age: 25 years; Married: 74.1%; Education: mean: 14 years; City residents: 90%	Mean # partners last year: 5.3; ≤1 female partner: 27.1%	Casual sex: 78.2%; Bought sex from men: 14.2%; Sold sex to men: 17.7%	W. stable partner: always: 13.7%; never: 34.2%; W. casual partners: always: 24.8%; never: 28.6%		Sent 534 questionnaires; 353 valid questionnaires returned

TABLE 3

A Summary of Intervention Projects Among MSM in China

Source	Intervention Content and Target Population	Evaluation	
		Method	Main Findings Related to HIV/STD
Zhang, 2001 [36]	Friend Communication Project; started in 1998; health promotion materials; hotline counseling by MSM volunteers	Year 2000; N = 635; single group design; cross-sectional questionnaire survey	Attention to HIV/STD: 22% started to pay attention; 59% paid more attention to it; selection of sexual partner: 81% became more careful; among those who had casual sex (68%): 25% stopped casual sex; 50% reduced casual sex; among those who had anal sex with men (69%): 22% stopped anal sex with men; 44% reduced casual sex with men; among those who had oral sex with men (81%): 14% began to use condoms during oral sex; 8.5% increased condom use; 4.1% consistently use condoms; practiced uninsert sex (i.e., no insert and no body fluid exchange) more often: 63%
Shi, 2003 [38]	Friend Communication Project	Year 2001.5-8; questionnaire survey; N = 379 who had no stable sexual partner for analysis; 3-group comparison: those received intervention 1 year versus 1-2 years versus 2 years	No significant differences in risk sexual behaviors during last year, such as: # sexual partners; # casual partners; unprotected anal sex with casual partners; condom use; looked for casual partner in public places; involved in commercial sex; involved in group sex
Zhang, 2003 [37]	Friend Communication Project	Year 2001; N = 1109; questionnaire survey	Attention to HIV/STD: 90% started to or paid more attention to it; selection of sexual partner: 88% became more careful; AIDS/STD prevention awareness: 97% increased the awareness; casual sex: 71% stopped or reduced casual sex; anal sex: 63% stopped or reduced anal sex; practiced uninsert sex (i.e., no insert and no body fluid exchange) more often: 48%
China-UK [39]	Comprehensive HIV intervention project in Chengdu; started in 2002; self-organized by MSM volunteers; promote safe sex through community care groups, hotlines, peer education, health education, and culture building	Year 2003.10; questionnaire survey; N = 3158	Consistent condom use in last 6 months: increased from 3.3% in baseline to 14.2% in 6-months follow-up and to 28.6% in 1-year follow-up

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