

# **HIV/AIDS behavioral surveillance among men who have sex with men in China**

*—community and Internet based surveys*

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## ABBREVIATIONS

<b>AIDS</b>	Acquired Immunodeficiency Syndrome
<b>BSS</b>	Behavioral Surveillance System
<b>CCMD-3</b>	Chinese Category of Mental Diseases-3
<b>DU</b>	Drug User
<b>ELISA</b>	Enzyme-linked Immunosorbent Assay
<b>FHI</b>	Family Health International
<b>FSW</b>	Female Sex Worker
<b>HIV</b>	Human Immunodeficiency Virus
<b>IDU</b>	Injecting Drug User
<b>ICF</b>	Informed Consent Form
<b>MOH</b>	Ministry of Health
<b>MSM</b>	Men Who have Sex with Men
<b>NCAIDS</b>	National Centre for HIV/AIDS Prevention and Control
<b>PLWHA</b>	People Living with HIV/AIDS
<b>STD</b>	Sexually Transmitted Diseases
<b>STI</b>	Sexually Transmitted Infections
<b>UAI</b>	Unprotected Anal Intercourse
<b>UNAIDS</b>	Joint United Nations Program on HIV/AIDS
<b>UNGASS</b>	The United Nations General Assembly Special Session on HIV/AIDS
<b>WHO</b>	World Health Organization

## **ABSTRACT**

### **BACKGROUND**

The coverage of HIV/AIDS behavioral surveillance among MSM in China falls far short of what is necessary as the current approach is expensive and time consuming. In addition MSM are difficult to reach in China. Internet-based behavioral surveys have demonstrated a number of advantages compared with the traditional paper-pen method. Chinese MSM are avid users of the Internet. Use of the internet provides an opportunity to access this hard-to-reach population and explore their use of the Internet for sexual purposes as well as to assess risk behaviors among MSM internet users. This thesis aimed to explore the trends in risk behaviors and HIV prevalence among MSM using traditional community-based surveys and Internet surveys, and to analyze the potential of web-based behavioral surveillance among MSM by comparing the differences between Internet and community-based MSM samples, and then to provide insights for the future HIV/AIDS behavioral surveillance, epidemic estimation and prediction as well as health intervention among the Chinese MSM population.

### **METHODS**

This study has three components. The first focuses on trends in HIV risk behaviors and prevalence among MSM in Harbin in northeast China, based on community-based surveys. Eligible participants were approached by peer recruiters in traditional gay venues and then interviewed by health professionals with a standard questionnaire. Urine samples were collected to screen their HIV status.

The second part presents two cross-sectional, Internet-based surveys among MSM in China in 2006 and 2007. The study website was advertised on three selected gay websites using a series of banners, pop-ups and text notifications. After providing consent to the survey, eligible participants were invited to complete an online questionnaire.

The third component compares the demographic characteristics and risk behaviors of two samples of Chinese MSM. Participants living in Heilongjiang Province were extracted from the 2006 online survey dataset to compare with the community sample of MSM recruited in Harbin, the capital city of Heilongjiang Province in the same year.

## **KEY FINDINGS**

### ***Community-based behavioral surveillance***

Among MSM in Harbin, a trend was observed towards more self-identifying as homosexual (from 58% to 80%) and more living with a male partner (from 12% to 41%) over the study period 2002-06.

Although there was a trend towards a reduction in the rate of never using a condom and an increase in the rate of always using condoms during anal sex in the past six months, the prevalence of unprotected anal intercourse (UAI) still remained at high level (from 90% in 2002 to 72% in 2006). Most respondents reported having multiple male sexual partners ( $\geq 2$ ) in the past six months: 86.5% in 2002, 76.0% in 2004 and 91.6% in 2006.

The HIV prevalence (2.2%, 15/674) among MSM in Harbin in 2006 was higher than that in previous survey years (1.3% in 2002 and 0.94% in 2004), but no statistically significant change was detected.

### ***Internet-based behavioral surveys***

Gay website users in China are young and well educated. The majority (85%) have used the Internet to seek sex and meeting sexual partners online, which is one of the most common reasons for visiting gay websites. Traditional gay venues still play an important role in the sex seeking process, especially for MSM who are older and less educated.

Gay website users are vulnerable to HIV/AIDS given their high prevalence of UAI (56.6%) and multiple male sexual partners (66.5%). The type of partners plays an important role in determining consistent condom use. An increase in condom use was observed among MSM having sex between commercial partners relative to those having sex with non-regular partners and regular partners.

Among the Internet sample, participants who have regular partners are less likely to have sex with females, less likely to have multiple partners and less likely to engage in commercial sex behaviors than those who do not.

### ***Comparisons between Internet and community samples***

There are significant differences in terms of demographic characteristics and risk behaviors between the Internet and community samples of MSM. The Internet sample was significantly younger, more educated and more likely to be students and self identify as homosexual.

Among those who had anal sex in the past six months, the Internet sample tended to use condoms less consistently than the community sample. However, using the total sample size as the denominator to calculate the prevalence of UAI, no significant difference between the two samples was observed (*AOR* 1.02, *CI* 0.73-1.43, *p* = 0.905).

After adjusting for differences in demographic characteristics, the community sample was more likely to have had sex with females (*AOR* 2.01, *CI* 1.22-3.30, *p* = 0.006) and have had  $\geq 6$  male partners in the previous six months than the Internet sample (46.1% vs. 20.2%; *AOR* 4.88, *CI* 3.51-6.80, *p* < 0.001). The mean number of male partners for the community sample was  $13.5 \pm 16.8$ , whereas it was  $6.0 \pm 12.2$  for the Internet sample.

## **CONCLUSIONS**

Although there is a trend towards an increase in condom use among MSM in China, they are vulnerable to HIV/AIDS infection given their high prevalence of UAI and multiple sexual partners. Public sector officials at all levels need to recognize this risk for HIV transmission. Health promotion and behavioral interventions should be enforced and scaled up to meet the need for controlling HIV transmission among MSM in China. Since the Internet has become a risk environment for MSM and the online MSM population is significantly different from the traditional community MSM group, online MSM should be included as a risk group in national HIV sentinel and behavioral surveillance and the coverage of surveillance for this specific group should be expanded to better understand the health promotion needs of this community as part of an HIV/AIDS strategy in China.

## PUBLICATIONS DURING CANDIDATURE

1. **Dapeng Zhang, Peng Bi, Fan lv and Janet E Hiller.** *Web-based HIV/AIDS behavioral surveillance among men who have sex with men: potential and challenges.* ***International Journal of Infectious Diseases***, 2008,12(2):126-131.
2. **Dapeng Zhang, Peng Bi, Fan lv, Jie Zhang and Janet E Hiller.** *Changes in HIV prevalence and sexual behavior among men who have sex with men in a northern Chinese city: 2002-2006.* ***Journal of Infection***, 2007, 55(5):456-463.
3. **Dapeng Zhang, Peng Bi, Fan Lv, Houlin Tang, Jie Zhang and Janet E Hiller.** *Internet use and risk behaviors: an online survey of visitors to three gay websites in China.* ***Sexually Transmitted Infections***. 2007,83(7):571-576.
4. **Dapeng Zhang, Peng Bi, Fan Lv, Houlin Tang, Jie Zhang and Janet E Hiller.** *Differences between Internet and community samples of men who have sex with men: implications for behavioral surveillance among MSM in China.* ***AIDS Care***. (Accepted 3 Dec 2007)

## DECLARATION

In order to track changes in risk behaviors and HIV prevalence among men who have sex with men in China, data based on two cross-sectional surveys that were conducted in 2002 and 2004 were used in this thesis to compare with the 2006 community-based survey. The 2002 and 2004 surveys were conducted by myself during the time when I was working in the China National Center for AIDS/STD Control and Prevention.

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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1. *Dapeng Zhang, Peng Bi, Fan Lv and Janet E Hiller. Web-based HIV/AIDS behavioral surveillance among men who have sex with men: potential and challenges. International Journal of Infectious Diseases. 2008,12(2):126-131.*
2. *Dapeng Zhang, Peng Bi, Fan Lv, Jie Zhang and Janet E Hiller. Changes in HIV prevalence and sexual behavior among men who have sex with men in a northern Chinese city: 2002-2006. Journal of Infection, 2007, 55(5):456-463.*
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