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Full Length Research Paper

HIV prevention services utilization among men who have sex with men that have recently migrated to Beijing

Hongyan LU[1], Xuefeng LI[2], H. Fisher RAYMOND[3], Yanming SUN[1], Xiong HE[1], Song FAN[2], Willi MCFARLAND[3,4], Yan XIAO[2]*, Yuhua RUAN[2] and Yiming SHAO[2]

[1]Beijing Center for Disease Control and Prevention, Beijing, People's Republic of China.
[2]State Key Laboratory for Infectious Disease Prevention and Control, and National Center for AIDS/STD Control and Prevention (NCAIDS), Chinese Center for Disease Control and Prevention (China CDC), Beijing, People's Republic of China.
[3]San Francisco Department of Public Health, San Francisco, 94102, USA.
[4]Department of Epidemiology and Biostatistics, University of California, San Francisco, CA 94105, USA.

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To assess HIV prevention services access among men who have sex with men (MSM) that recently migrated to Beijing, we conducted a cross-sectional study from October 2010 to January 2011 in Beijing using social network based recruitment. Ten "seeds" were selected purposefully. Each subsequent participant was given three recruitment cards to hand to potential recruits. Participants completed a computer-assisted interviewer-administered questionnaire. Questions included demographic information, sexual behaviors, HIV testing information, drug use information. Partner-by-partner sexual behavior, condom use, HIV discussion and HIV status disclosure were assessed. In total, 500 participants were recruited. Twenty percent of the participants reported living in Beijing for less than two years. Short-term MSM residents of Beijing were more likely to be under 20 years old, have lower educational attainment, lower income and lack health insurance compared to long-term MSM residents. In terms of access to HIV prevention services, fewer short-term residents accessed services than long-term residents did. Short-term residents in our study had fewer MSM peers in their social networks, taken with the finding that many men find out about HIV prevention programs through social networks. This suggests that short-term residents are at a disadvantage in being aware of the HIV prevention services available to them. HIV prevention programs must make a concerted effort to reach out to recent migrant MSM.

Key words: Men who have sex with men, migrants, China, HIV prevention services, HIV testing.

INTRODUCTION

Migrants, particularly internal migrants, have been identified as a key population at risk for HIV infection in China (Hong et al., 2006). This group includes men who have sex with men (MSM), a population known to be central to the HIV epidemic in China (He et al., 2007). Migrants in China have been shown to be at higher risk for HIV infection through sex work (both male and female migrants) and through higher levels of HIV / AIDS related stigma (He, 2007; Hong et al., 2008). The combination of HIV risk associated with migrant status and those associated being MSM may well compound these individuals'

*Corresponding author. E-mail: xiaoy1800@163.com. Tel/Fax: +86-10-63012643.

risk of becoming HIV infected. Moreover, migrants in China are often not eligible for, or find it difficult to access services in their new residence location, which may compound the risk of HIV transmission among this group (Zhang, 2001).

Migrant status among MSM has been shown to be associated with both HIV and syphilis infection in China (Wang et al., 2012). Moreover, Liu et al. (2012) found that young migrant MSM in China had low consistent condom use, thus increasing their risk for HIV infection. Although there is less literature on migrant MSM outside of China, the few studies that have examined this phenomenon have also found that migrant MSM are also at high risk of HIV and STI acquisition (Evans et al., 2011; George et al., 2007). In addition, migrant MSM who are not eligible for services in their new residence area may not seek out HIV prevention services (Thomas et al., 2010). World-wide, comprehensive HIV prevention services for MSM include, HIV testing, access to condoms and lubricants and STD testing (Beyrer et al., 2012; Rebe et al., 2011). Furthermore, knowing one's status and responsibility to partners may influence the uptake of HIV testing, particularly when including discussions of HIV with sexual partners (Lorenc et al., 2011).

Beijing, the capital of the People's Republic of China, is a cosmopolitan city of over 17 million people. Beijing attracts many migrants looking for work, those attending university and others (Li et al., 2006). HIV prevalence among MSM in Beijing has risen rapidly over the past 7 years and is now estimated to be over 6% in some studies (Ma et al., 2007). Furthermore, published reports suggest that MSM in Beijing comprise 44% of the total recent HIV cases identified in that city (China Daily, 2009). Previous research suggests that in 2006, over 80% of MSM in Beijing were not registered residents (that is-they do not hold Beijing Hukou) and that this proportion had risen since 2004 (Ma et al., 2007). Considering the risk associated with migrant status, being MSM and the current epidemic situation among MSM in Beijing, we conducted the current study to assess HIV prevention services access among MSM who have recently migrated to Beijing.

MATERIALS AND METHODS

Participants

A cross-sectional study was conducted among MSM from October 2010 to January 2011 in Beijing. Participants were eligible if they were male, 18 years of age or older, a Beijing resident, had sex with another man in the past 12 months (sex can be defined as oral, anal or mutual masturbation), had a valid study recruitment coupon, had not previously participated in the survey and were able to provide written informed consent. Study staff reviewed all study procedures and the informed consent form before asking potential participants to enroll in the study. The study was approved by the Committees for Human Research of the National Center for AIDS of the China Center for Disease Control and Prevention, Vanderbilt University and the University of California San Francisco.

Recruitment

Study participants were recruited using respondent-driven sampling (RDS) as a method to obtain a robust and diverse sample (Heckathorn, 1997; Magnani et al., 2005). Ten diverse (e.g., age, education, geography and risk behaviors) MSM were selected to function as recruiter "seeds". Seeds were evaluated for their commitment to the goals of the study and motivation to recruit three eligible peers in their social network. Seeds were each asked to recruit up to three participants, who in turn were asked to recruit a subsequent wave of up to three participants and so on, until our target sample size was reached and equilibrium was achieved on key variables. All subsequent participants had to be a member of the recruiter's social network and meet the eligibility criteria for the study. Each participant was given three recruitment coupons/cards with study information to hand to potential recruits. To keep track of social networks, each card had a number code that linked participants to the initial seeds. Participants were compensated 30 Yuan (CNY) for their participation in the study, as well as 20 Yuan (CNY) for each eligible participant they recruited who subsequently completed a study interview.

Measures

After providing informed consent, participants completed a computer-assisted interviewer-administered questionnaire in a separate room of the Beijing CDC clinic. Trained health professionals conducted the interviews. HIV testing was conducted using standard laboratory methods with initial HIV-positive results confirmed with a Western Blot. Questions included demographic information (e.g., age, ethnicity, education, marital status, occupation, residence, income, and health insurance status), sexual behaviors (e.g., age of the first sex with male and female partners, self-identified sexual orientation, role in anal sex, and the number and types of male and female sex partners in the past 6 months), HIV testing information (e.g. testing ever or in the past 12 months), and drug use information. HIV prevention services use was measured with a series of questions that asked "In the past year have you…". The services asked about were: received free condoms and lubricant, had a free STD test and or treatment, had free counseling or testing as has been done in other studies (Thomas et al, 2009; McDaid et al., 2010).

The duration of stay in Beijing was assessed using a continuous variable "How long have you lived in Beijing?" For those stating less than one year the fraction of a year was recorded. Recent arrivals were defined as having lived in Beijing for less than two years. We used self-reported size of participants' MSM social network as a proxy for social support (the more MSM friends one has reflects the persons available to be a support network). We also asked partner-by-partner sexual behavior, condom use, HIV discussion and HIV status disclosure questions for up to three male partners within the prior 6 months. Finally, studies have shown that stigma and discrimination around HIV / AIDS negatively impact the uptake of HIV prevention services (Blas et al., 2011; Song et al., 2011). HIV / AIDS stigma was assessed using a 22 question measure developed to measure these constructs in the developing world (Genberg et al., 2008). This measure was summed and then divided by 22 to give a mean score ranging from 0 to 1, where 0 is no stigma and 1 is complete stigma towards HIV/AIDS. The complete computer-assisted interviewer-administered questionnaire was pilot tested among a group of 20 MSM volunteers recruited through peer outreach before being deployed in the full study. Only minor

changes to wording were made following the pilot.

Data analysis

We used SPSS version 15.0 to conduct statistical analyses. Chi-square (χ^2) and Fisher's exact tests were used for categorical variables, while Z tests were used for continuous variables. We chose not to adjust analyses using the conventional analytic package (Respondent Driven Sampling Analysis Tool, RDSAT) for the primary reason that we are drawing inference to relationships between factors within our sample prioritized in the present analysis over point estimates to generalize from the sample to the population of Beijing MSM as a whole. In addition to the uncertainties over whether RDS can be adjusted to approximate a simple random sample, we further emphasized that the large population size of Beijing raises further uncertainties as to whether our survey is inclusive of the whole city given that the sampling fraction is quite small. In other words, a conservative estimate of the MSM population size of 1.2% of adult men would translate to an enormous and diverse population over a vast area. In the absence of a gold standard to verify adjustments or create post-weights, we provided sample estimates as our primary outcome.

RESULTS

A total of 500 participants were recruited for the study. Peer based recruitment approaches do not allow measures of refusals as in other sampling approaches. However, of the 1218 coupons distributed, 501 (41%) were subsequently presented by potential participants. Of those that presented theirs, 99.8% were eligible and enrolled in the study. 2% of the sample reported living in Beijing for less than two years. Hence, we presented demographic and HIV risk related charac-teristics stratified by whether participants were “short-term” or “long-term” residents of Beijing (Tables 1 and 2).

Short-term MSM residents of Beijing were significantly more likely to be under 20 years of age (20.6%) compared to long-term MSM residents (3.8%) (χ^2 40.9, p<0.0001). On the other hand, long-term residents were significantly more likely to have a university or higher educational level (46.7%) compared to short-term residents (25.5%) (χ^2 16.1, p <0.001). Short-term residents also had lower income than long-term residents did (24.5% vs. 11.8%, χ^2 27.4, p <0.0001) and were more likely to lack health insurance (65.7% vs. 39.7%, χ^2 22.2, p <0.0001). As might be expected, short-term residents were significantly more likely to not hold official Beijing residence permits (hukou) compared to long-term residents (1.9% vs. 24.1%, χ^2 25.3, p <0.0001). Short-term residents were less likely to report a current main partner (44.5 %) compared to 60.3% of long-term residents (χ^2 8.1, p = 0.003). Although small numbers of both short and long-term residents reported being paid for sex, the difference was significant with 4.9 and 1.0% of short and long-term residents reporting this behavior, respectively (p = 0.02). Worth mentioning, in terms of unprotected anal intercourse about one third of both groups reported any unprotected insertive or unprotected receptive anal intercourse with a male partner in the past six months. Finally, 10 (9.8%) short-term residents tested positive for HIV in the present study compared to 29 (7.2%) long-term residents. Although prevalence was slightly higher among short-term residents compared to long-term residents the difference was not significant.

In terms of access to HIV prevention services, both groups received information about HIV prevention programs from peers or sex partners at about the same rate. Overall, 41.2% of short-term residents compared to 48.9% of long-term residents received HIV prevention program information from these sources. Fewer short-term residents accessed services across the board than long-term residents had (Table 3). Only 64.7% of short-term residents compared to 78.9% of long-term residents received free condoms and lubrication (χ^2 8.9, p = 0.003). Only 38.2% of short-term residents compared to 64.6% of long-term residents received free STD tests or treatment (χ2 23.3, p <0.0001). Moreover, only 38.2% of short-term residents received free voluntary counseling and testing (VCT) for HIV compared to 66.1% of long-term residents (χ^2 26.3, p < 0.0001). Finally, only 41.7% of short-term residents had actually been tested for HIV in the past compared to 76.4% of long-term residents (χ^2 33.5, p <0.0001).

We captured information regarding participants’ discussion of HIV with male sex partners and their awareness of and stigma towards HIV / AIDS (Table 4). In terms of discussing HIV and disclosing HIV status to male sex part0ners, fewer short-term residents (51.5%) discussed HIV with male sex partners compared to 71.4% of long-term residents (χ^2 14.4, p <0.0001). Short-term residents were also significantly less likely to disclose their own HIV status to male sex partners (65.4%) compared to long-term residents (85.9%) (χ^2 12.8, p = 0.001). In terms of knowing HIV – positive people, knowing anyone that was sick due to HIV infection and knowing anyone who had died from AIDS both groups knew few people (differences were statistically significant between the two groups, however the mean number reported by each group for each category was so small that they make little real difference). Both groups reported moderately low levels of stigma towards HIV / AIDS (short –term residents: mean 0.35, SD 0.13, long-term residents: mean 0.34, SD 0.13).

Finally, our crude measure of social support (i.e., social network size) found that short-term residents had significantly much smaller social networks of other MSM. Short-term residents reported a mean network size of 14.9 (Standard Deviation (SD) 16.5) compared to 55.6 (SD 228.0) among long-term residents (z 3.5, p <0.0001).

DISCUSSION

In our study of MSM in Beijing, China, we sampled

Table 1. Demographic and risk characteristics among MSM, by length of stay, Beijing, China.

Variable	Short-term residents[1] n = 102; n (%)	Long-term residents[2] n = 398; n (%)	X^2	p
Age				
≤20	21 (20.6)	15 (3.8)		
21-40	77 (75.5)	320 (80.4)	40.86	<0.001
41-60	4 (3.9)	58 (14.6)		
>60	0 (0)	5 (1.3)		
Education				
Less than high school	37 (36.3)	90 (22.6)	16.06	<0.001
High school	39 (38.2)	122 (30.7)		
Tertiary or above	26 (25.5)	186 (46.7)		
Marriage				
Single	88 (86.3)	306 (76.9)	4.29	0.117
Married	10 (9.8)	67 (16.8)		
Divorced / Widowed	4 (3.9)	25 (6.3)		
Occupational situation				
Employed	86 (84.3)	354 (90.5)	1.67	0.43
Student	9 (8.8)	24 (6.0)		
Unemployed	7 (6.9)	20 (3.5)		
Income per month (CNY)				
0	14 (13.7)	34 (8.5)		
1 - 1000	11 (10.8)	13 (3.3)	27.4	<0.0001
1001 - 2999	59 (57.8)	183 (45.9)		
3000 - 4999	7(6.9)	72 (18.1)		
≥5000	11 (10.8)	96 (24.1)		
Health insurance				
Yes	35 (34.3)	240 (60.3)	22.16	<0.0001
No	67 (65.7)	158 (39.7)		
Size of Beijing' gay network (mean, SD)	14.9 (16.5)	55.6 (228.0)	3.5*	<0.0001
Has Beijing residence card (Hukou)	2 (1.9)	96 (24.1)	25.3	<0.0001

[1]Resident in Beijing less than 2 years; [2]Resident in Beijing 2 years or more; *Does not total to 100% due to missing data.

sufficient numbers of newly arrived migrant MSM to make comparisons to longer-term MSM residents of the city. Short-term residents were younger, had less education, had lower income, were less likely to have health insurance and were less likely to hold official residence permits for Beijing. Additionally, short-term residents were more likely to have only casual male partners but did not have more partners on average than did long-term residents, a finding that differed from that found among cross border migrant MSM in Europe (Evans et al., 2011). Short-term residents were also more likely to engage in sex work compared to long-term residents, although the number involved in this behavior was small. Moreover, both short-term and long-term residents engaged in about the same level of unprotected anal intercourse. Short-term residents were less likely to access HIV prevention services, including HIV testing, compared to long-term residents.

In terms of access to services, longer term resident MSM in Beijing appeared to be more similar to gay / bisexual men in Scotland while short term resident MSM had levels similar to MSM in Chennai, India (McDaid et al., 2010; Thomas et al., 2009). Compared to MSM in other locations worldwide, migrant MSM in Beijing have lower

Table 2. Risk characteristics among MSM by length of stay in Beijing, China.

Variable	Short-term residents[1] n = 102; n (%)	Long-term residents[2] n = 398; n (%)	X^2	p
Age had first sex with a woman (mean, SD)	20.7 (3.9)	21.8 (3.9)	2.54**	<0.01
Age had first sex with a man (mean, SD)	21.6 (5.6)	22.6 (7.2)	1.51**	0.13
Self-report preference during anal sex				
Top	23 (23.5)	98 (25.5)		
Versatile	62 (63.3)	240 (62.3)	0.2	0.9
Bottom	13 (13.3)	47 (12.2)		
No. of male partners, past six months (mean, SD)	5.16 (6.32)	4.79 (13.15)	0.29**	0.76
Recent partner type				
Main	45 (44.5)	228 (60.3)	8.08	0.003
Casual	56 (55.5)	15 (39.7)		
Any unprotected insertive anal intercourse with male partner, past 6 months	29 (28.4)	116 (29.2)	0.02	0.9
Any unprotected receptive anal intercourse with a male partner, past 6 months	34 (33.3)	113 (28.4)	0.96	0.33
Bought sex in the past 6 months	1 (1.0)	3 (1.0)	0.05***	0.8
Paid for sex n the past 6 months	5 (4.9)	3 (1.0)		0.02
Tested HIV-positive	10 (9.8)	29 (7.2)	0.72	0.39

Z test; * Fisher's exact.

Table 3. Access to HIV prevention services among MSM by length of stay in Beijing, China.

Type of service	Short-term residents[1] n = 102; n (%)	Long-term residents[2] n = 398; n (%)	X^2	p
Free condom and lubricant, past 12 months	66 (64.7)	314 (78.9)	8.9	0.003
Free STD test or treatment, past 12 months	39 (38.2)	257 (64.6)	23.3	<0.0001
Free counseling and/or testing, past 12 months	39 (38.2)	263 (66.1)	26.3	<0.0001
Prior HIV test, ever	48 (41.7)	304 (76.4)	33.5	<0.0001

[1]Resident in Beijing less than 2 years; [2]Resident in Beijing 2 years or more.

significantly) proportion of short-term residents tested positive for HIV antibodies in our study. Finally, short-term residents had markedly smaller social networks than did longer-term residents, while similar proportions of both groups accessed information about HIV prevention programs from these networks.

Meanwhile, the current study has some limitations. First, although a robust sampling method was used to penetrate deep into the community, it is unclear what segment of the overall population of MSM in Beijing was included. It may well be that the current study reached only a small segment located in only a small geographic section of this large city. Nonetheless, the inclusion of a good number of recent arrivals suggests that this population is in need of greater access to HIV prevention services. Secondly, we only were able to assess social support through the proxy of the number of MSM participants known, while social support is a complex construct requiring in depth measures. Social support may also include non-MSM social contacts. Future research into social support among migrant MSM will need to use expanded measures of social support.

Conclusions

While it is reassuring that risk behaviors do not appear to vary greatly between short-term and long-term MSM residents of Beijing, the fact that short-term residents exhibit lower levels of access to HIV prevention services is worrisome. Similar to previous findings, short-term residents of Beijing were less likely to access HIV testing (Song et al., 2011). Moreover, short-term residents in our

Table 4. HIV information sources, HIV/AIDS discussion with partners and HIV/AIDS awareness and stigma among MSM by length of stay in Beijing, China.

Type of service	Short-term residents[1] n = 102; n (%)	Long-term residents[2] n = 398; n (%)	X^2	p
Received information about HIV prevention programs from peers / sex partners	42 (41.2)	195 (48.9)	1.9	0.16
Talked with most recent partner about HIV	52 (51.5)	270 (71.4)	14.39	0.000
Told most recent partner his HIV status	34 (65.4)	232 (85.9)	12.81	0.001
# HIV positive people known (mean, SD)	0.19 (0.34)	0.52 (2.1)	6.57	0.01
# people they have known that are sick due to AIDS (mean, SD)	0	0.13 (0.68)	14.35	<0.0001
# people they have known that have died due to AIDS (mean, SD)	0	0.03 (0.38)	3.05	0.08
Stigma towards HIV/AIDS (mean score, SD)	0.35 (0.13)	0.34 (0.13)	0.69*	0.49

[1]Resident in Beijing less than 2 years; [2] resident in Beijing 2 years or more; *Z test.

study had fewer MSM peers in their social networks, taken with the finding that many men find out about HIV prevention programs through social networks. This suggests that short-term residents are at a disadvantage compared to longer-term residents in being aware of the HIV prevention services available to them. Therefore, HIV prevention programs must make a concerted effort to find ways to identify and reach out to recent migrant MSM to ensure they have access to HIV prevention services, particularly HIV testing.

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