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HIV/AIDS-related stigmatizing and discriminatory attitudes and recent HIV testing among Beijing men who have sex with men

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Abstract

The study was to assess the correlates for recent HIV testing and HIV/AIDS-related stigmatizing and discriminatory attitudes among men who have sex with men (MSM) in Beijing, China. A cross-sectional study probed demographics, sexual and drug use behaviors, HIV testing, and prevention services. Of 500 participants, 39.3% recently received a test for HIV. Recent testing was independently associated with expressing lower levels of HIV/AIDS-related stigmatizing and discriminatory attitudes, more male sex partners, no female sexual partners and knowing HIV status of their last male partner. Expressing lower levels of HIV/AIDS-related stigmatizing and discriminatory attitudes was independently associated with recent testing, younger age, and knowing HIV status of their last male partner. This study revealed that HIV/AIDS-related stigmatizing and discriminatory attitudes were common and inversely associated with recent HIV

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Conflicts of Interest
No.

testing. Low levels of testing highlighted the urgent needs to reduce HIV/AIDS-related stigma and discrimination and expand HIV testing among Beijing MSM.

Keywords

HIV/AIDS; stigma; discrimination; testing; men who have sex with men

Introduction

As the epidemic has been evolved over 3 decades, stigma and discrimination has been a barrier to HIV prevention and care. The effect of stigma and discrimination on people's ability to access HIV testing, counseling, diagnosis, care, treatment, and prevention messages varies from setting to setting, but when present, stigma and discrimination can create an environment where people may avoid HIV-related services. HIV continues to spread among men who have sex with men (MSM) on a global level (van Griensven, de Lind van Wijngaarden, Baral, & Grulich, 2009). A literature review revealed that gay men in low and middle income countries have 19.3 (95%CI: 18.8 to 19.8) times higher odds of having HIV compared with general population (Baral, Sifakis, Cleghorn, & Beyrer, 2007). MSM contributed to about half of new HIV infections in many Western countries (Boer IM, Op de Coul, Koedijk, Veen MG, Sighem AI, & Laar MJW,; Hall, Song, Rhodes, Prejean, An, Lee et al., 2008). In China, MSM contributed to a third (33%) of recent estimated new HIV infections in 2009 (Raymond HF, 2007), which was near tripled the estimated number (12%) in 2007. A rapid rise in the prevalence of HIV infection among MSM was observed in recent years in many cities in China, e.g., the prevalence rates among Beijing MSM were increased from 0.4% in 2004 to 5.8% in 2006, and 8.0% in 2009 (X. Ma, Zhang, He, Sun, Yue, Chen et al., 2007b).

HIV testing plays a critical role in containing the epidemic. HIV testing and counseling can help reduce risk behaviors (Leaity, Sherr, Wells, Evans, Miller, Johnson et al., 2000; Weinhardt, Carey, Johnson, & Bickham, 1999), and HIV testing could lead to early diagnosis and timely prevention, linkage-to-care and medical treatment (Janssen, Holtgrave, Valdiserri, Shepherd, Gayle, & De Cock, 2001; Valdiserri, Holtgrave, & West, 1999). However, stigma and discrimination have been identified as major barriers to uptake HIV-related prevention services (Agwu & Ellen, 2009; Mahajan, Sayles, Patel, Remien, Sawires, Ortiz et al., 2008; UNAIDS, Dec 2003). HIV/AIDS-related stigma and discrimination can adversely influence decisions to seek HIV testing (Chesney & Smith, 1999; Kalichman & Simbayi, 2003). Previous studies mainly focused on assessing HIV/AIDS-related stigma and discrimination as perceived experience of HIV-infected individuals (Abadia-Barrero & Castro, 2006; Rahmati-Najarkolaei, Niknami, Aminshokravi, Bazargan, Ahmadi, Hadjizadeh et al., 2010; Thi, Brickley, Vinh, Colby, Sohn, Trung et al., 2008) or assessing the attitudes of the general population against people living with HIV/AIDS (Herek, Capitanio, & Widaman, 2002; Letamo, 2003; Unnikrishnan, Mithra, T, & B, 2010), but limited data are available in assessing the prejudicial attitudes among the MSM community towards PLWHA. HIV-related stigma/discrimination is common in the MSM community (Courtenay-Quirk, Wolitski, Parsons, & Gomez, 2006; Flowers, Duncan, & Frankis, 2000).

It is critical to investigate HIV/AIDS related stigma and discrimination among MSM and its impact on seeking HIV testing in containing the epidemic. This study was to assess correlates for recent HIV testing and stigmatizing and discriminatory attitudes towards PLWHA among Beijing MSM.

Methods

Study Participants

A cross-sectional study was conducted among MSM in September and October 2009 in an outpatient clinic affiliated to Beijing Centers for Disease Control and Prevention (CDC). Individuals were eligible for the study if they (1) identified as male, (2) were 18 years of age or older, (3) reported living in Beijing, (4) reported oral, anal sex, or mutual masturbation with a man in the past 12 months, (5) had a valid study recruitment coupon, (6) had not previously participated in the survey, and (7) were able to provide written informed consent. Each study participant was screened for study eligibility prior to enrollment. The study was approved by the Committees for Human Research of the National Center for AIDS of the China CDC, Vanderbilt University and the University of California San Francisco.

Recruitment

Respondent-driven sampling (RDS) was used to recruit MSM participants. Seven seeds were selected from bar, bathroom, park, Internet, grassroots organization, and peer referral. Seeds were selected based on their commitment to recruit 3 eligible peers within their social network, in addition to key demographic characteristics and risk behaviors necessary to ensure diverse sample representation. Each seed received 3 recruitment coupons to recruit MSM peers from their network. The coupon included the project name, address and phone number of the interview site, study identification number, and expiration date. A unique serial number on each coupon linked each subject to his recruiters. The recruits of the seeds also received 3 coupons for additional recruitment. Both seeds and recruited participants received incentives, both to be interviewed (US \$4 as “primary incentives”) and to refer additional recruits (US \$3 as “secondary incentives”).

Measures

After eligibility screening and obtaining informed consent, each participant received a 20 minute computer-assisted interview. The questionnaire asked participants about general demographics, sexual and drug use behaviors, HIV testing history, and stigmatizing and discriminatory attitudes towards PLWHA.

(1) Demographics, Sexual Risk Behaviors—Demographic questions included age, ethnicity, education, marital status, employment, sexual orientation, and Beijing residence status. Risk behavior measures included ever engaging in unprotected sexual intercourse, history of substance use (e.g., alcohol or drugs), disclosure of sexual orientation, and the number of male and female sexual partners.

(2) HIV Testing Behaviors—All participants were asked if they had ever tested for HIV and, if applicable, the number of prior tests, and the date and results of their most recent test. Recent testers were defined as participants received a test for HIV in the past year.

(3) HIV/AIDS-Related Stigma and Discrimination—Individual attitudes towards PLWHA were measured by asking participants about their agreement and disagreement (1='yes', 2='no') with 22 statements. The scale was adapted from two pilot investigations conducted in Thailand and Zimbabwe.(Genberg, Kawichai, Chingono, Sendah, Chariyalertsak, Konda et al., 2008) This scale measured 3 dimensions of HIV/AIDS-related stigma and discrimination: shame, blame, and social isolation; perceived discrimination; and equity. The scale included such questions as “People living with HIV/AIDS should be ashamed”; “People living with HIV/AIDS face neglect from their family”; “People living with HIV/AIDS do not deserve any support”. Items were summed to create total scale scores, with a range of 22-44 (some items were reverse-scored so that a higher score indicates a lower level of HIV/AIDS-related stigma and discrimination). Acceptable reliability was supported by an alpha value of 0.83.

(4) Laboratory Testing—Serum samples were screened for HIV-1 antibodies by enzyme-linked immunosorbent assay (ELISA; Vironostika HIV Uni-Form plus O, bioMerieux, Holland) and confirmed as positive by Western Blot test (HIV Blot 2.2 WBTM, Genelabs Diagnostics). Syphilis screening was performed by rapid plasma regain (RPR; Shanghai Rongsheng, Shanghai, China) and confirmed by Treponemapallidum particle assay test (TPPA; Fujirebioinc, Japan).

Statistical Analyses

Respondent-Driven Sampling Analysis Tool (RDSAT 5.6, Cornell University, Ithaca, NY, USA) was used to generate weighted point estimates and 95% confidence intervals (95%CI) (Volz, Wejnert, Degani, & Heckathorn, 2007). Statistical Analysis Software (SAS 9.1 for Windows; SAS Institute Inc, Cary, NC) was used for all analyses. Univariate and multivariable analysis were conducted after assigning cases individual weights for recent HIV testing and HIV/AIDS-related stigma and discrimination which were exported from RDSAT. The factors associated with recent testing were assessed using a univariate analysis, then multivariable logistic regression analysis. Odds ratios (ORs) and 95% CIs were calculated in the multiple logistic regression analysis using a stepwise method. Statistical significance was determined at $p < 0.05$ in the final model. The weighted mean scale scores of HIV-related stigma and discrimination were first calculated for each variable level. Subsequently, simple and multiple linear regression analysis were applied to determine which predictors (demographic factors, sexual behaviors, recent testing) were independently associated with total scale scores after controlling for all potential confounders.

Results

Characteristics of Participants

A total of 500 MSM were recruited and interviewed. About half (50.4%) of them were younger than 30 years old, more than two-third (68.1%) received high school or higher

levels of education, 79.9% were employed with a full time job, 61.7% self-identified as homosexual, 41.8% had three or more male partners, 25.8% had female sexual partners, and 22.8% knew HIV status of their last male partner.

Sexual and Substance Use Behaviors

The rates of unprotected insertive or receptive anal sex with their last male partner in the past 6 months were 34.8% and 40.5%, respectively. Of the participants, 0.1% had used drugs in the past 12 months. Of those who had sex with females, 80.0% had unprotected sex with female sexual partner in the past 6 months (Table 1).

HIV Testing and HIV/AIDS-related Stigma and Discrimination

Of the participants, 39.3% received a recent HIV test and a third (33.2%) had never received a test for HIV in the past 12 months. The weighted prevalence of HIV was 8.0% (95%CI: 4.7-12.0%) with 86.1% of them unaware of their infection, syphilis was at 22.0% (95%CI: 16.8-27.3%) (Table 1).

A comparison of stigma and discrimination scores for recent HIV testers and non-recent testers indicated that recent testers among had significant higher score of stigma and discrimination ($p < 0.001$), expressing as lower negative attitudes towards PLWHA, than non-recent testers (Fig. 1).

Correlates for Recent HIV Testing

Univariate analysis revealed that MSM who had a higher education level, were unmarried, sought male sex partners through the Internet, had sex with their last male partner in low-risk places, knew HIV status of their last male partner, and disclosed HIV status with their last male partner were more likely to have recently received a test for HIV (Table 2). Multivariable logistic regression analysis indicated that recent HIV testing was associated with lower levels of HIV/AIDS-related stigma and discrimination (AOR=1.1, 95%CI: 1.0-1.2), having 3 male partners in the past 6 months (AOR=1.9, 95%CI: 1.1-3.3), having no female sexual partners in the past 6 months (AOR=3.0, 95%CI: 1.6-5.8), and knowing the HIV status of their last male partner (AOR=3.6, 95%CI: 1.9-6.5).

Correlates for Stigmatizing and Discriminatory Attitudes towards PLWHA

Univariate analysis revealed that recent testers were less likely to have negative attitudes towards PLWHA, MSM who had a full time job, higher income, 3 male partners in the past 6 months, no female partners in the past 6 months, a regular partner, never got drunk, received free condoms/lubricant in the past 12 months, and did not fear an HIV-positive test result, had lower degree of negative attitudes towards PLWHA. MSM who were younger and knew where to receive HIV testing were more likely to have lower degree of negative attitudes towards PLWHA. The multivariate linear regression analysis suggested that MSM who had recent HIV testing ($\beta = 0.7$, $p < 0.05$), were younger ($\beta = 1.8$, $p < 0.001$), and knew HIV infection status of their last male partner ($\beta = 0.9$, $p < 0.05$) were more likely to express lower levels of stigmatizing and discriminatory attitudes towards PLWHA (Table 3).

Discussion

This is the first study in China in assessing stigmatizing and discriminatory attitudes towards PLWHA and its relationship with HIV testing among Beijing MSM. This study revealed that stigmatizing and discriminatory attitudes against PLWHA were common and inversely associated with recent HIV testing among Beijing MSM. Confronting a rapid rise of HIV epidemic among MSM in China, common negative attitudes towards PLWHA, low levels of testing and high levels of undiagnosed infections among this group has become emerging challenges in containing the epidemic. The negative attitudes towards PLWHA could be a critical barrier in expanding testing and reduce the levels of undiagnosed HIV infections. Studies demonstrated that stigma and discrimination remains significant barriers to HIV testing in diverse settings (Fortenberry, McFarlane, Bleakley, Bull, Fishbein, Grimley et al., 2002; W. Ma, Detels, Feng, Wu, Shen, Li et al., 2007a) and that lack of HIV testing was associated with greater negative attitudes towards PLWHA (Genberg, Hlavka, Konda, Maman, Chariyalertsak, Chingono et al., 2009; Kalichman & Simbayi, 2003). The findings of the present study underlined the urgent needs to reduce the stigmatizing and discriminatory attitudes towards PLWHA, expand HIV testing and reduce the levels of undiagnosed HIV infections among this group.

This study showed that having multiple sex partners was independently associated with HIV testing. Other reports showed that MSM who have sex with multiple partnerships acknowledge their higher risk and undergo testing to determine whether this behavior has resulted in infection (Do, Chen, McFarland, Secura, Behel, MacKellar et al., 2005; Jin, Prestage, Law, Kippax, Van de Ven, Rawsthorne et al., 2002; McGarrigle, Mercer, Fenton, Copas, Wellings, Erens et al., 2005). A survey in Baltimore where reported the highest HIV prevalence among MSM in the United States suggested that young MSM with a greater number of lifetime male partners were more likely to receive HIV testing (Sifakis, Hylton, Flynn, Solomon, MacKellar, Valleroy et al., 2010). The findings of the present study suggested that common multiple sex partners and existing sexual network among this group could offer an intervention opportunity in expanding HIV testing.

This study revealed that recent HIV testing was independently associated with the awareness of HIV status of one's last male partner. It is consistent with other reports from Australia and the United States (Jin et al., 2002), (MacKellar, Valleroy, Anderson, Behel, Secura, Bingham et al., 2006). Other studies on stigmatizing attitudes of the general population against PLWHA have shown that HIV/AIDS-related stigma are inversely related to discussion about HIV/AIDS (Dias, Matos, & Goncalves, 2006; Genberg et al., 2009), disclosure of HIV status (Maman, Mbwanbo, Hogan, Weiss, Kilonzo, & Sweat, 2003), and ever tested for HIV (Genberg et al., 2009; Kalichman & Simbayi, 2003). Common multiple sex partners, non-disclosure of HIV status, and negative attitudes towards PLWHA showed in this study highlighted the urgent needs in focused efforts to encourage disclosure of HIV status between partners, promote HIV testing, and decrease stigmatizing and discriminatory attitudes towards PLWHA.

The low levels of testing and high levels of undiagnosed infections found in this study indicated that prevention programs would not yet operate effectively for MSM in Beijing. A

third of MSM had never tested for HIV. This figure is more than three times the level measured among MSM in 21 cities of the United States in 2008 (10%) (Deiss, Brouwer, Loza, Lozada, Ramos, Firestone Cruz et al., 2007). Low testing uptake and high levels of undiagnosed infection would have a significant impact on the epidemic, because men with undiagnosed HIV infection were also more likely to engage in unprotected anal sex and have unknown serostatus partners (Branson, Handsfield, Lampe, Janssen, Taylor, Lyss et al., 2006). Men with undiagnosed HIV infection were also unaware of their most recent partner's serostatus and held higher negative attitudes towards safe sex practices. The findings of this study underscored the urgent needs in intensifying the intervention effort to improve not only testing coverage but testing frequency among MSM to link and retain HIV infected individuals in prevention, care and treatment programs.

HIV testing plays an important role in prevention and control epidemic, HIV testing and counseling can help reduce risk behaviors (Leaity et al., 2000; Weinhardt et al., 1999), and expanding HIV testing could facilitate early diagnosis and timely prevention, linkage-to-care and medical treatment (Janssen et al., 2001; Valdiserri et al., 1999). However, stigma and discrimination have been identified as major barriers to uptake HIV-related prevention services (Agwu & Ellen, 2009; Mahajan et al., 2008; UNAIDS, Dec2003). HIV/AIDS-related stigma and discrimination can adversely influence decisions to seek HIV testing (Chesney & Smith, 1999; Kalichman & Simbayi, 2003). Recently community-based clinic trials results have provided proof of antiretroviral treatment as prevention (Abdool Karim, Abdool Karim, Frohlich, Grobler, Baxter, Mansoor et al.,; Cohen, Chen, McCauley, Gamble, Hosseinipour, Kumarasamy et al., 2011; Grant, Lama, Anderson, McMahan, Liu, Vargas et al.,; NIAID/NIH., 2011), which have given us new biological tools to control the epidemic. The early initiation of antiretroviral therapy reduced rates of sexual transmission of HIV-1 and clinical events, indicating both personal and public health benefits from such therapy (Cohen et al., 2011). It is time to address various barriers in scaling up the effort to link the best advancements in science to the needs of the community. It is very critical to better understand stigmatizing and discrimination attitudes towards PLWHA when expanding HIV testing, prevention, care and treatment in controlling epidemic among this group.

This study also found that younger MSM were more likely to express lower negative attitudes towards PLWHA. The reasons for this could be that the younger MSM have higher levels of education, lower perceived stigmatizing and discriminatory social pressure, and have greater access to HIV/AIDS message and health information. Studies on stigmatizing attitudes of the general population against PLWHA showed that HIV/AIDS-related stigma are inversely related to knowledge about modes of HIV transmission, (Dias et al., 2006) and educational attainment (Dias et al., 2006; Kalichman, Simbayi, Jooste, Toefy, Cain, Cherry et al., 2005), and but positively related to age (Genberg et al., 2008). The present study also found that bisexual MSM were inversely associated with HIV testing. Our other study among Shandong MSM found that bisexual men are more likely to be older and have lower levels of HIV-related knowledge than men who have sex with men-only. (Liao, Kang, & Jia, 2011) The common bisexual practice showed in the present study were consistent with our previous study and other reports in China (Choi, Gibson, Han, & Guo, 2004; Gu, Qu, Lu, Luo, Wang, & Gu, 2004; Jiang, Cao, Zhang, Xia, Gong, Xue et al., 2006; Liao et al., 2011;

X. Ma et al., 2007b; Ruan, Yang, Zhu, Ma, Li, Zhao et al., 2008), it is more common than a corresponding figure obtained in the West (Hightow, Leone, Macdonald, McCoy, Sampson, & Kaplan, 2006). Chinese culture is still relatively conservative in discussing homosexuality as a open subject (Liu & Choi, 2006). Stigma and discrimination against MSM in Chinese societies may be still quite serious (Choi, Hudes, & Steward, 2008), it may explain partially the observed common bisexual behaviors (Liao et al., 2011). Common stigmatizing and discriminatory attitudes against PLWHA and common bisexual practice among Beijing gay men highlighted the challenges in effectively expanding HIV testing.

This is the first study in China described HIV/AIDS-related stigmatizing and discriminatory attitudes towards PLWHA and its correlates and relationship with HIV testing among Beijing MSM. This study highlighted an important area that warrants HIV prevention and research work. We also recognized the limitations of this study. First, the stigma/discrimination scale may provoke socially desirable answers from respondents. Participants may feel embarrassed to be open expressing stigmatizing and discriminatory attitudes towards PLWHA during the face-to-face interviews, thus, this study might underestimate the true levels of negative attitudes and the risk behavior. Second, the nature of the cross-sectional study design precluded the ascertainment of causal relationship. Other limitations may stem from the monetary incentive having relatively stronger draw among persons of lower socio-economic status, as noted in other RDS surveys (Johnston, Malekinejad, Kendall, Iuppa, & Rutherford, 2008).

In conclusion, this study revealed that stigmatizing and discriminatory attitudes towards PLWHA inversely associated with recent testing among Beijing MSM. Common HIV/AIDS-related stigmatizing and discriminatory attitudes, low levels of testing, and high levels of undiagnosed infections among this group have become emerging challenges containing the epidemic. The stigmatizing and discrimination attitudes towards PLWHA could be a critical barrier to expanding testing and reduce the levels of undiagnosed HIV infections. The findings of this study highlighted the urgent needs to reduce HIV/AIDS related stigma and discrimination, encourage disclosure of HIV status, and expand HIV testing among this group.

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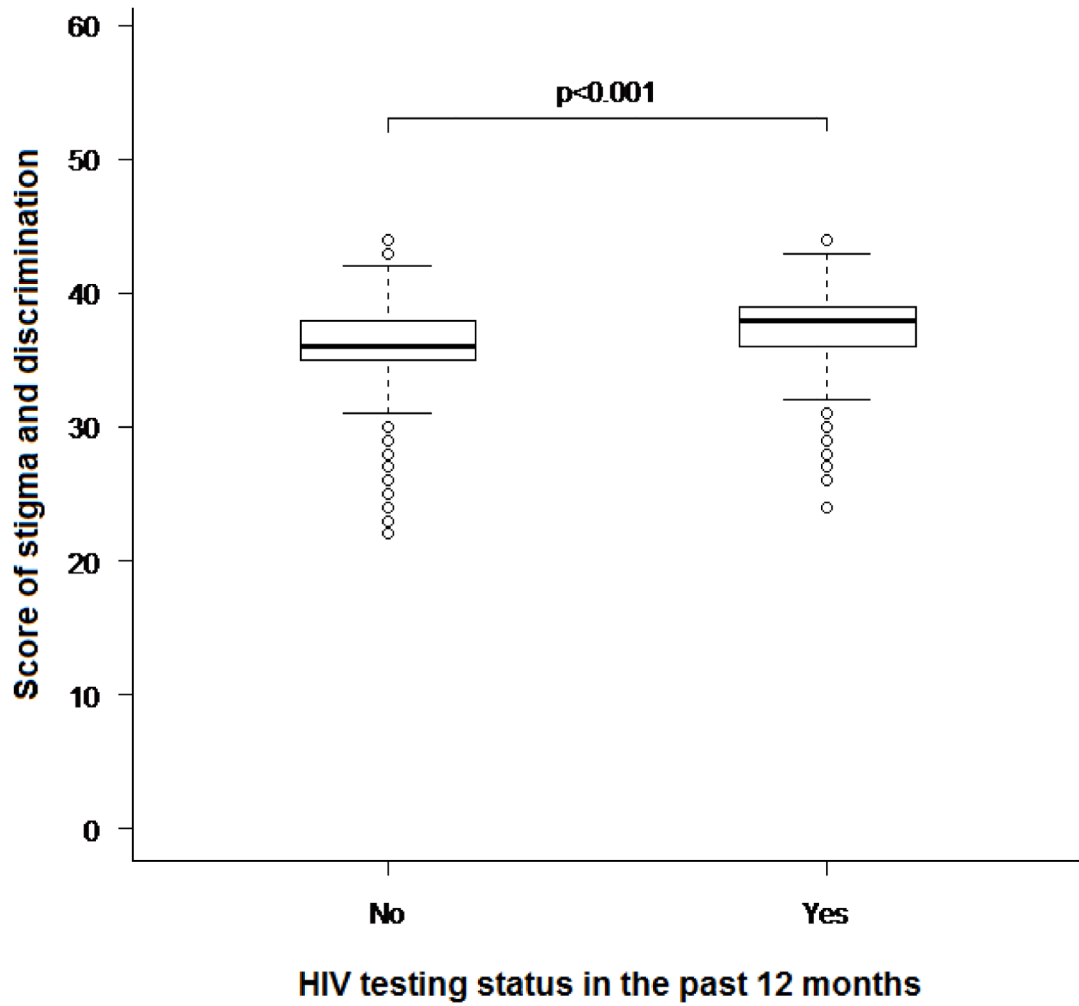


Fig. 1. Comparison of the degree of stigma and discrimination between participants ever received and never received a test for HIV in the past 12 months

Table 1
Recent HIV testing, stigmatizing and discriminatory attitudes towards people living with HIV/AIDS among men who have sex with men, Beijing, 2009

Variable	Total		HIV testing in P12M		Stigma/discrimination
	N	Weighted % (95%CI)	N	Weighted % (95%CI)	Weighted Mean (95%CI)
Age (years)	Median: 29; range from 18 to 71				
18-29	268	50.4(42.8-58.1)	145	40.6(33.1-50.1)	37.7(37.2-38.1)
30-71	232	49.6(41.9-57.2)	121	37.8(29.4-48.3)	35.9(35.5-36.3)
Education					
Middle school and lower	163	31.5(25.4-38.1)	74	30.5(22.0-41.4)	35.5(34.9-36.1)
High school or higher	337	68.5(61.9-74.6)	192	43.9(36.3-52.6)	37.4(37.0-37.8)
Current marital status					
Married	104	27.2(20.8-36.0)	45	28.7(17.5-41.5)	35.7(35.0-36.4)
Unmarried	396	72.8(64.0-79.2)	221	42.3(36.6-50.9)	37.2(36.8-37.6)
Employment status					
Full time	406	79.9(74.1-85.4)	218	43.1(37.4-52.1)	36.8(36.5-37.2)
Part time, student, unemployed, or retired	94	20.1(14.5-25.9)	48	23.6(13.1-36.2)	36.7(35.9-37.6)
Monthly income (U.S. dollar), P12M					
<150	105	23.8(17.6-29.5)	47	20.1(11.1-31.2)	36.3(35.5-37.2)
150	395	76.2(70.5-82.4)	219	44.1(38.2-52.9)	36.9(36.6-37.3)
Have health insurance					
Yes	236	45.6(39.3-52.6)	126	39.8(31.1-50.3)	37.4(37.0-37.8)
No	264	54.4(47.4-60.7)	140	38.4(31.1-47.7)	36.3(35.8-36.8)
Self-reported sexual orientation					
Homosexual	346	61.7(55.4-68.3)	188	41.4 (34.7-50.0)	36.6(36.2-37.0)
Bisexual, straight, or undecided	154	38.3(31.9-44.4)	78	34.3(25.0-44.7)	37.1(36.5-37.7)
No. of male partners, P6M					
<3	236	58.2(50.6-63.8)	114	36.2 (27.9-43.9)	37.1(36.6-37.5)
3	264	41.8(36.2-49.4)	152	44.5 (37.3-55.7)	36.4(36.0-36.9)
Had female sexual partner, P6M					
Yes	104	25.8(19.3-31.6)	46	22.7(14.9-32.8)	36.4(35.7-37.0)
No	396	74.2(68.4-80.6)	220	45.2(38.7-53.6)	36.9(36.6-37.3)
Type of last male partner, P6M					
Regular partner	309	60.8(53.8-67.8)	169	45.4 (38.8-54.8)	36.9(36.5-37.3)
Casual partner	179	39.2(32.2-46.2)	90	30.8 (22.5-41.1)	36.7(36.2-37.3)
Found male sex partners through Internet					
Yes	189	38.1(32.2-47.0)	109	49.1 (40.8-60.6)	37.9(37.4-38.4)
No	296	61.9(53.0-67.8)	149	33.8(25.2-40.9)	36.1(35.7-36.5)
Unprotected insertive anal sex with last male partner, P6M					
Yes	127	34.8(28.2-41.6)	58	37.8(27.3-50.1)	36.8(36.1-37.5)
No	220	65.2(58.1-72.1)	127	42.8(34.0-51.9)	36.8(36.3-37.3)

Variable	Total		HIV testing in P12M		Stigma/discrimination
	N	Weighted % (95%CI)	N	Weighted % (95%CI)	Weighted Mean (95%CI)
Unprotected receptive anal sex with last male partner, P6M					
Yes	115	40.5(31.3-48.4)	51	32.9(21.5-45.3)	37.4(36.8-38.0)
No	170	59.5(51.7-68.5)	99	35.8(26.1-46.2)	36.9(36.3-37.4)
Venue of sex with last male partner, P6M					
Bathhouse/ Sauna/ Park/ Public rest room	60	13.9(8.9-18.0)	26	25.3(15.1-41.8)	35.7(34.7-36.7)
Residence / Bar / Club/ Hotel	428	86.1(82.0-91.1)	233	41.7 (34.6-48.7)	37.0(36.7-37.4)
Known HIV status of last male sex partner					
Yes	129	22.8(18.1-28.3)	88	58.0(44.5-69.8)	37.7(37.2-38.2)
No	359	77.2(71.8-81.9)	171	34.2(28.0-41.9)	36.6(36.2-37.0)
Disclosed HIV status with last male partner					
Yes	236	45.6(38.5-52.1)	143	46.2(36.3-55.6)	37.4(37.0-37.8)
No	252	54.4(47.6-61.0)	116	33.6 (26.8-43.1)	36.4(35.9-36.9)
Unprotected sex with female partner, P6M					
Yes	75	79.6(66.5-97.9)	31	10.9(0.3-28.2)	36.3(35.4-37.1)
No	29	20.4(2.1-33.0)	15	40.8(0-100.0)	36.7(35.8-37.6)
Ever got drunk					
Yes	152	47.3(36.8-57.0)	74	37.4(25.3-50.7)	36.8(36.2-37.3)
No	167	52.7(43.0-63.2)	94	42.9(33.2-61.7)	36.3(35.7-37.0)
Received free condoms/lubricant, P12M					
Yes	436	78.0(72.8-84.5)	256	49.2 (42.1-57.0)	36.8(36.5-37.2)
No	64	22.0(15.4-27.2)	10	9.1 (3.0-17.0)	36.7(35.7-37.7)
Fear of knowing HIV-positive testing result					
Yes	413	83.6(79.2-87.7)	218	37.2 (31.0-44.5)	36.8(36.5-37.2)
No	87	16.4(12.3-20.8)	48	50.5 (36.1-64.0)	36.6(35.6-37.5)
Known where to get HIV test					
Yes	470	89.0(83.8-94.3)	263	43.4(37.2-50.7)	36.9(36.6-37.2)
No	29	11.0(6.0-15.9)	3	3.8(0-11.3)	35.7(34.0-37.4)
Stigmatizing and discriminatory attitudes					
Ever tested for HIV	500		NA	1.1(1.0-1.1)	NA
Yes	334	51.4(43.8-58.4)	NA		37.2(36.8-37.6)
No	166	48.6(41.4-56.6)			36.3(35.7-36.9)
Received a test for HIV, P12M					
Yes	266	39.3(33.2-46.3)	NA		37.2(36.8-37.7)
No	234	60.7(53.8-66.8)			36.5(36.0-37.0)
Drug use, P12M					
HIV positive	4	0.1(0-0.1)	3	41.2(0-100.0)	37.3(35.3-39.4)
Syphilis positive	36	8.0(4.7-12.0)	16	33.1(15.7-51.9)	37.0(35.9-38.1)
	110	22.0(16.8-27.3)	59	35.8(24.9-50.1)	37.4(36.7-38.0)

Note: The subtotals may not add up to 500 due to missing values; Recent HIV testing indicated the participants have ever received a test for HIV in the past 12 months; P12M: in the past 12 months; P6M: in the past 6 months; NA: not applicable.

Table 2
Correlates of recent HIV testing among men who have sex with men, Beijing, 2009

Variable	B	Wald χ^2	OR(95%CI)	P	β	Wald χ^2	AOR(95%CI)	P
Higher level education (vs < high school)	0.6	8.245	1.8(1.2-2.7)	0.004				
Married	-0.5	6.118	0.6(0.4-0.9)	0.013				
Full time employed	0.7	8.572	2.1(1.3-3.4)	0.003				
Monthly income (< 150 U.S. dollar)	1.0	17.003	2.7(1.7-4.3)	<0.001				
Had 3 male partners, P6M	0.4	5.031	1.5(1.1-2.2)	0.025	0.7	5.960	1.9(1.1-3.3)	0.015
Had no female sexual partner, P6M	1.1	21.283	3.0(1.9-4.8)	<0.001	1.1	11.294	3.0(1.6-5.8)	0.001
Casual partner, P6M	-0.5	7.439	0.6(0.4-0.9)	0.006				
Found male sex partners through Internet	0.6	9.596	1.8(1.2-2.6)	0.002				
Sex with last male partner at Bathhouse/ Sauna/ Park/ Public rest room, P6M	-0.7	5.506	0.5(0.3-0.9)	0.019				
Knew HIV status of last male partner	0.5	16.975	2.5(1.6-3.8)	<0.001	0.6	16.755	3.6(1.9-6.5)	<0.001
Disclosed HIV status w/ last male partner	0.2	7.023	1.6(1.1-2.4)	0.008				
Unprotected sex with female partner, P6M	-0.8	3.382	0.4(0.2-1.1)	0.066				
Ever got drunk	-0.6	6.900	0.5(0.3-0.9)	0.009				
Received free condoms/lubricant, P12M	1.2	43.402	10.5(5.2-21.2)	<0.001				
Fear of knowing HIV-positive result	-0.3	5.166	0.6(0.4-0.9)	0.023				
Lower level of stigma and discrimination (continuous scale)	0.1	4.274	1.1(1.0-1.1)	0.039	0.1	4.538	1.1(1.0-1.2)	0.033

Note: Recent HIV testing indicated the participants have ever received a test for HIV in the past 12 months; P6M: in the past 6 months; P12M: in the past 12 months; OR: odds ratio; 95%CI: confidence interval; AOR: adjusted odds ratio; Multivariable logistic regression analysis was applied for HIV recent testing, in which the data weighted with the respondent driven sampling analysis tool (RDSAT) were applied.

Table 3
Correlates for HIV/AIDS-related stigmatizing and discriminatory attitudes among Beijing's men who have sex with men

Variable	β (95%CI)	P	Adjusted β (95%CI)	P
Younger age (v.s. >29 years)	1.8(1.2-2.4)	<0.001	1.8(1.2-2.4)	<0.001
Higher level education (v.s. <high school level)	1.9(1.2-2.6)	<0.001		
Unmarried	1.5(0.8-2.3)	<0.001		
Have health insurance	1.1(0.4-1.7)	0.001		
Had <3 male partners, P6M	0.6(-0.01-1.3)	0.056		
Found male sex partners through Internet	1.8(1.2-2.5)	<0.001		
Had sex with last male partner at Bathhouse/ Sauna/ Park/ Public rest room, P6M	-1.3(-2.3- -0.4)	0.006		
Knew the HIV status of last male partner	1.1(0.3-1.9)	0.006	0.9(0.1-1.7)	0.022
Disclosed HIV status with last male partner	1.1(0.4-1.7)	0.002		
Knew where to get HIV test	1.2(0.1-2.2)	0.029		
Ever received a test for HIV, P12M	0.8(0.1-1.4)	0.026	0.7(0.03-1.3)	0.041

Note: P6M: in the past 6 months; P12M: in the past 12 months; Multivariable linear regression was performed for HIV/AIDS-related stigmatizing and discriminatory attitudes, in which the data weighted with the respondent driven sampling analysis tool (RDSAT) were applied.