

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	High Incidence of HIV and syphilis among Migrant Men Who have Sex with Men in Beijing, China: A Prospective Cohort Study
AUTHORS	Mao, Hengyi; Ma, Wenzhe; Lu, Hongyan; Wang, Lu; Zheng, Hui; Zhu, Yingying; Yu, Rongbin; Wang, Ning; Peng, Zhihang

VERSION 1 - REVIEW

REVIEWER	Liyang Zhang, PhD Wayne State University School of Medicine, USA
REVIEW RETURNED	21-Apr-2014

GENERAL COMMENTS	<p>This study used a prospective cohort study to investigate the incidence of HIV and syphilis, and examined the factors that were associated with seroconversion and the factors influencing the retention rate among migrant men who have sex with men (MSM) in Beijing, China. The total of 511 of migrants MSM were recruited and followed at 4- and 8-month after the enrollment. Blood tests were taken for test the HIV and syphilis infection. Authors found that migrant MSM had a high incidence of HIV and syphilis than other previous studies. The implications were discussed. This is a very interesting study. It can be considered to be published after a minor revision.</p> <p>Main comments:</p> <p>Abstract:</p> <p>(1) Please use the structured abstract of NIH.</p> <p>(2) I do not understand that the sample is from Beijing and the Setting of study is Yunnan.</p> <p>(3) Please clarify the sentence "Bisexual orientation was negatively associated with syphilis seroconversion".</p> <p>Methods:</p> <p>(1) Combining the sentence in page 4 line 38 "Thus a total of 511 eligible...." with the sentence in page 6 lines 30-36.</p> <p>(2) There is the sentence in page 5 line 20 that "...a history of STDs was collected." In the results, authors may need to report the percentage of MSM having a history of STDs. Table 1 shows that 94 subjects had "have ever received examination or treatment for STD" is not equal "having a history of STDs".</p> <p>(3) Why did authors implement the follow-up at 4- and 8-month, please clarify.</p> <p>Results:</p> <p>(1) The results in Tables and context should be consistent. Table 2 shows the incidence of HIV while Table 3 shows that incidence of syphilis. There is no total syphilis incidence in Table 3.</p> <p>(2) In the context, authors reported the factors for both table 2 and table 3, but in the end of the sentence in page 9 line 54 "... a risk</p>
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	<p>factor (table 3).” Need to revise and make the results reporting more clear.</p> <p>(3) The first letter of each word using a capital letter in some tables, but not in others, please be consistent. And the font in page 9 is different from others.</p> <p>Discussions:</p> <p>(1) Although authors mentioned some reasons of bisexuals are more likely to be lost follow-up, you may want to talk more about this why they are more likely to be lost. For example, marriage and stigma issues may play some roles.</p> <p>(2) According to authors, bisexuals are more likely to have high risk behaviors, can you give some interpretations?</p> <p>(3) In page 14 line 5, “...deserve further discussion”, do you mean “further investigation”?</p> <p>(4) In page 14 line 36, authors stated that “the sample size was insufficient...” What is the sufficient sample size for your study? Did you do the power analysis?</p> <p>(5) In page 14 line 48, authors mentioned that “Bisexual MSM were at a high risk...” the implications for the programs are too general. Please specify what need to do for them and how to do it.</p> <p>(6) Although authors provide a well written paper, authors still need to go through the whole manuscript and read careful for the formatting before the publication.</p>
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REVIEWER	Li Ling Sun Yat-sen University, China
REVIEW RETURNED	30-Apr-2014

GENERAL COMMENTS	<p>Migrant MSM may have more risk for HIV infection and contribute to the epidemic of HIV, therefore it is an important topic to study in HIV prevention. However, the title and the topic of this paper do not really match with its content. Also the results and conclusion of this paper were biased, as authors mentioned. For example, the subjects who ever had group sex were more easily lost to follow-up, while this subgroup were the most high risk group of HIV seroconversion, according to Table 2 and 5. Thus, the HIV incidence may be underestimated and the risk factors of HIV infection may be misunderstood due to missing data of subjects lost to follow-up. In addition, the paper in its current form is not very readable and rewriting or substantive editing is needed to improve its readability. There are a few things that the author may consider in terms of improving the manuscript:</p> <p>1.INTRODUCTION. This part should be organized more logically to tell the background and reason of this research. Information on Chinese MSM cohort study and retention rate should be mentioned, and the reason of why to conduct MSM migrant cohort study should be told more clearly.</p> <p>2.METHOD. The method of deciding sample size should be described in detail. Consider use of a flow diagram of cohort. Page 6 Line 51-56, syphilis infection progress is different from HIV and has no window period, but the author use similar methods to calculate the observation time of HIV and syphilis. Reason for choosing this method in the paper should be described.</p> <p>3.Since less than 15 of age of first anal intercourse was a risk factor of HIV infection (Table 2), this categorical variable should be reported in Table 1. Table 4 and 5 reported factors associated with four and eight month’s retention rate, respectively. The results of these two tables were not similar. Authors should tell readers why to</p>
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	<p>use two individual tables, the differences between them, and try to explore reasons of differences.</p> <p>4. Discussion should be reorganized to focus on key points, not just listing similarities with other researches. Comments should be based on the results from tables. For example, Page 13 Line 42, authors suggest to educate young people to delay the age of first sexual activity, however, the median age of first sex and first anal sex were 20 and 22 years old in Table 1. Here, to delay age of first sex is not a good evidence-based advice.</p> <p>5. In ABSTRACT, setting of this research was Yunnan, however, the title was "... MSM in Beijing, China".</p>
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REVIEWER	Eric PF Chow Central Clinical School, Monash University, Australia
REVIEW RETURNED	12-May-2014

GENERAL COMMENTS	<p>I think the article and the analysis can be strengthened by addressing or including the following:</p> <ol style="list-style-type: none"> 1. Some of the statistics and references are not up-to-date. Authors should provide the latest statistics. For example, <ol style="list-style-type: none"> (1) Page 2. 11% PLWHA in 2007 (which was 7 years ago from now) (2) Page 2. The prevalence of HIV in different cities was also out-dated. Author can refer to the following article for most recent HIV prevalence in different provinces. Eric P. F. Chow, Joseph T. F. Lau, Xun Zhuang, Xiaohu Zhang, Yanjie Wang, and Lei Zhang, "HIV Prevalence Trends, Risky Behaviours, and Governmental and Community Responses to the Epidemic among Men Who Have Sex with Men in China," BioMed Research International, vol. 2014, Article ID 607261, 19 pages, 2014. doi:10.1155/2014/607261 (3) Page 3. 501 new HIV/AIDS cases in the first five months of 2009. 2. Unclear expression. Some of the expressions were not correct and unclear. For example, <ol style="list-style-type: none"> (1) Page 2. MSM is a population but not a mode of transmission, author should use 'homosexual transmission' or 'male-to-male sexual contact' instead of 'MSM transmission'. (2) Page 2. It is not clear what does 'social and sexual mixing' mean (3) Page 3. HIV/AIDS cases from the cumulative data were from domestic provinces. What does 'domestic' mean? (4) Page 5. "At least two different and current contact sources" – Does it mean the two last sexual contacts? 3. Page 4 study population. The study recruited participants who did not have a permanent household registration in Beijing. Did authors also consider the duration of migration or the length of staying in Beijing for the recruitment criteria? Did foreigners fall into the selection criteria? 4. Authors only excluded HIV positive individuals at the beginning but not those with syphilis. It is not correct to calculate syphilis incidence if there are any syphilis positives at the beginning of the study. 5. Data analysis. The incidence of HIV and STI should be highly associated with the condom use but condom use was not examined in both univariate and multivariate analyses. The study factors in the
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	<p>univariate model for HIV and syphilis are different, it is not clear how authors identified the variables in the univariate models. Authors should provide more details on this section.</p> <p>6. Are there any data on the incidence of HIV-syphilis co-infection?</p>
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VERSION 1 – AUTHOR RESPONSE

Part A (Reviewer: 1)

Abstract:

1. Comment: Please use the structured abstract of NIH.

Reply: The abstract has been reformatted according to NIH standards.

2. Comment: I do not understand that the sample is from Beijing and the Setting of study is Yungnan.

Reply: We apologize for the confusion. The manuscript has been edited to show that both the sample and the setting are in Beijing.

3. Comment: Please clarify the sentence “Bisexual orientation was negatively associated with syphilis seroconversion”.

Reply: The sentence has been revised as “Bisexual orientation (aHR = 5.09, 95% CI 1.02 to 25.57) was significantly associated with syphilis seroconversion.”

Methods:

1. Comment: Combining the sentence in page 4 line 38 “Thus a total of 511 eligible....” with the sentence in page 6 lines 30-36.

Reply: The sentence has been rephrased as “Thus a total of 511 eligible and consenting MSM were enrolled into the prospective cohort, of whom 141 were syphilis-positive.”

2. Comment: There is the sentence in page 5 line 20 that “...a history of STDs was collected.” In the results, authors may need to report the percentage of MSM having a history of STDs. Table 1 shows that 94 subjects had “have ever received examination or treatment for STD” is not equal “having a history of STDs”.

Reply: The figure has been added into Table 1.

3. Comment: Why did authors implement the follow-up at 4- and 8-month, please clarify.

Reply: Although similar studies have used a 6-month or 12-month follow-up period, we were interested in noting whether there might be differences in infection rates compared with other studies if we used a shorter follow-up period.

Results:

1. Comment: The results in Tables and context should be consistent. Table 2 shows the incidence of HIV while Table 3 shows that incidence of syphilis. There is no total syphilis incidence in Table 3.

Reply: We have revised Table 3 to include the total syphilis incidence.

2. Comment: In the context, authors reported the factors for both table 2 and table 3, but in the end of the sentence in page 9 line 54 “... a risk factor (table 3).” Need to revise and make the results reporting more clear.

Reply: We have revised the Results section to make it consistent with data in tables.

3. Comment: The first letter of each word using a capital letter in some tables, but not in others, please be consistent. And the font in page 9 is different from others.

Reply: We have adjusted the format of the tables to be more consistent.

Discussion:

1. Comment: Although authors mentioned some reasons of bisexuals are more likely to be lost follow-up, you may want to talk more about this why they are more likely to be lost. For example, marriage and stigma issues may play some roles.

Reply: We have revised that section as follows: “Concerned about disclosing their MSM behavior to their female partners, bisexual MSM may be more reluctant to be followed up. Also, bisexual MSM are more likely to engage in risk behaviors, such as having unprotected sex to indicate loyalty to their female partners and having commercial or casual sex with men. Moreover, only 18.4% of the participants reported having received an examination or treatment for sexually transmitted diseases in the past 12 months, which may be caused by the high cost of health services and low coverage of health insurance for the migrant population.¹⁸ Low risk-awareness might be another reason for their lower access to HIV/STD test and treatment. All of these emphasize an urgent need for widespread and accurate syphilis screening and affordable treatment for migrant MSM in Beijing.”

2. Comment: According to authors, bisexuals are more likely to have high risk behaviors, can you give some interpretations?

Reply: We have revised that section as follows: “Concerned about disclosing their MSM behavior to their female partners, bisexual MSM may be more reluctant to be followed up. Also, bisexual MSM are more likely to engage in risk behaviors, such as having unprotected sex to indicate loyalty to their female partners and having commercial or casual sex with men. Moreover, only 18.4% of the participants reported having received an examination or treatment for sexually transmitted diseases in the past 12 months, which may be caused by the high cost of health services and low coverage of health insurance for the migrant population.¹⁸ Low risk-awareness might be another reason for their lower access to HIV/STD test and treatment. All of these emphasize an urgent need for widespread and accurate syphilis screening and affordable treatment for migrant MSM in Beijing.”

3. Comment: In page 14 line 5, “...deserve further discussion”, do you mean “further investigation”?

Reply: We thank the reviewer for this suggestion. The sentence has been revised as follows: “As differences almost certainly exist between young Chinese and American MSM, predictors of retention among young MSM in Beijing deserve further investigation.”

4. Comment: In page 14 line 36, authors stated that “the sample size was insufficient...” What is the sufficient sample size for your study? Did you do the power analysis?

Reply: We used the equation $n = ((z_{\alpha} \sqrt{2(pq)} + z_{\beta} \sqrt{p_0 q_0 + p_1 q_1}) / (p_1 - q_1))^2$ to calculate the sample size, where α and β are 0.05 and 0.10, and the corresponding and are 1.96 and 1.282. p_0 represents the prevalence of HIV among general MSM in Beijing, which was set to be 0.02 here according to the estimation of the HIV epidemic in 2012 and 2013 in Beijing; p_1 represents the prevalence of HIV among migrant MSM in Beijing, which was estimated to be higher than p_0 as 0.06, thus the n was calculated to be 502. Considering the possibility of loss to follow-up, we increased the target sample size by 10%. However, our final sample size was still smaller than those of some other cohort studies on MSM in China.

5. Comment: In page 14 line 48, authors mentioned that “Bisexual MSM were at a high risk...” the implications for the programs are too general. Please specify what need to do for them and how to do it.

Reply: The paragraph has been revised as follows: “The multiple regression analysis significantly revealed that self-identified bisexuals were five times more likely than homosexuals to be infected with syphilis. One major reason for this outcome could be that bisexuals may have more varied sexual behaviors with a wider range of sexual partners, including males and females. In addition, a cross-sectional study among young migrant MSM in Beijing discovered that MSM who were engaged in bisexual behavior had a higher rate of unprotected sex with stable female partners and were less

likely to take part in prevention behaviors,¹⁸ which was consistent with our finding that those who had at least one female sex partner and those whose first sexual partner was female were significantly more likely to be lost at four-month and eight-month follow-up visits, respectively. MSM face strong social pressure and stigma in China, which may lead them to hide their sexual orientation by unwillingly engaging in heterosexual relationships; thus, many Chinese MSM will potentially enter a heterosexual marriage due to social and familial pressure.⁴ Concerned about disclosing their MSM behavior to their female partners, bisexual MSM may be more reluctant to be followed up. Also, bisexual MSM are more likely to engage in risk behaviors, such as having unprotected sex to indicate loyalty to their female partners and having commercial or casual sex with men. Moreover, only 18.4% of the participants reported having received an examination or treatment for sexually transmitted diseases in the past 12 months, which may be related to the high cost of health services and low coverage of health insurance for the migrant population.¹⁸ Low risk-awareness might be another reason for their lower access to HIV/STD test and treatment. All of these emphasize an urgent need for widespread and accurate syphilis screening and affordable treatment for migrant MSM in Beijing.”

6. Comment: Although authors provide a well written paper, authors still need to go through the whole manuscript and read careful for the formatting before the publication.

Reply: We have reviewed the manuscript and revised all formatting errors.

Part B (Reviewer: 2)

Title:

Comment: the title and the topic of this paper do not really match with its content.

Reply: The title of the manuscript has been changed to “High Incidence of HIV and syphilis among Migrant Men Who have Sex with Men in Beijing, China : A Prospective Cohort Study” to better reflect the content.

Abstract:

Comment: setting of this research was Yunnan, however, the title was “... MSM in Beijing, China”.

Reply: We apologize for the confusion. The manuscript has been edited to show that both the sample and the setting are in Beijing.

Introduction:

Comment: This part should be organized more logically to tell the background and reason of this research. Information on Chinese MSM cohort study and retention rate should be mentioned, and the reason of why to conduct MSM migrant cohort study should be told more clearly.

Reply: The paragraph has been revised as follows: “In recent years, there has been growing awareness that internal migration within China may be shifting the HIV epidemic by broadening social integration and connecting populations from different regions through sexual networks.¹ Data from national behavioral surveillance during 2004-2005 showed that migrant HIV/AIDS cases accounted for more than 50% of total infections in nine mainland provinces.⁵ Numbers of cohort study on MSM have been implemented in China to reveal HIV epidemic among MSM, however the retentions of MSM were not so high in most of them. Retentions of these cohort studies can hardly maintain over 70% at 12-months follow-up, few of them even below 20%.^{6- 9} There are reasons for low retention rates, and migration of MSM may be an important one.⁸ Moreover, studies implemented among urban MSM also revealed a high proportion of migrants among MSM in major cities, such as in Beijing (88%),¹⁰ Chongqing (80.3%)¹¹ and Shanghai (79.7%).¹² Although migration itself does not spread HIV or other sexually transmitted diseases (STDs), it may increase the possibility of infection when combined with high risk behaviors, which are prevalent among MSM. It has been confirmed in numerous studies that high risk behaviors such as unprotected anal sex, commercial sex, group sex, casual sex and having multiple sexual partners are prevalent among MSM in China.¹³⁻¹⁵ On the other hand, perceived stigma and discrimination due to traditional Chinese culture and conservative social values have increasingly led Chinese MSM to disguise their sexual orientation with matrimony, which leads to a potential risk of transmitting HIV to the general population via heterosexual

transmission.¹⁴ As for migrants, lacking the stability of a family or a home community and with generally low educational levels, limited knowledge of HIV/AIDS prevention, and discrimination and marginalization from the mainstream metropolitan society, high risk behaviors may occur more frequently.^{16, 17} Furthermore, due to China's household registration system and urban social security system, migrants have limited access to comprehensive, convenient and long-term health services.¹⁸ Recently, some cross-sectional studies in China demonstrated that compared to local MSM, migrant MSM engage in more high risk sexual behaviors such as multiple sexual partners, higher frequencies of anal and oral intercourse, and unprotected sexual behaviors with both males and females.^{15, 19} As a marginal and vulnerable subpopulation, migrant MSM should be accorded a high level of consideration by researchers."

Method:

1. Comment: The method of deciding sample size should be described in detail.

Reply: We used the equation $n = ((z_{\alpha} \sqrt{2(pq)} + z_{\beta} \sqrt{(p_0 q_0 + p_1 q_1)} (p_1 - q_1)) / (p_1 - q_1))^2$ to calculate the sample size, where α and β are 0.05 and 0.10, and the corresponding z values are 1.96 and 1.282. p_0 represents the prevalence of HIV among general MSM in Beijing, which was set to be 0.02 here according to the estimation of the HIV epidemic in 2012 and 2013 in Beijing; p_1 represents the prevalence of HIV among migrant MSM in Beijing, which was estimated to be higher than p_0 as 0.06, thus the n was calculated to be 502. Considering the possibility of loss to follow-up, we increased the target sample size by 10%.

2. Comment: Consider use of a flow diagram of cohort.

Reply: We have now added a flow diagram as Figure 1.

3. Comment: Page 6 Line 51-56, syphilis infection progress is different from HIV and has no window period, but the author use similar methods to calculate the observation time of HIV and syphilis. Reason for choosing this method in the paper should be described.

Reply: We used this method of calculation to maintain comparability with the results of the following similar studies in our References section:

Li D, Li S, Liu Y, et al. HIV incidence among men who have sex with men in Beijing: a prospective cohort study. *BMJ Open* 2012;2:e001829.

Xu JJ, Zhang M, Brown K, et al. Syphilis and HIV seroconversion among a 12-month prospective cohort of men who have sex with men in Shenyang, China. *Sex Transm Dis* 2010;37:432-9.

In addition, in our study all participants who tested positive for HIV/syphilis received additional posttest counseling and referrals to relevant free services. In consideration of curability and repeated infection of syphilis, participants who were syphilis-negative during follow-up period continued to be regarded as negative subjects of observation.

Results:

1. Comment: Since less than 15 of age of first anal intercourse was a risk factor of HIV infection (Table 2), this categorical variable should be reported in Table 1.

Reply: We have revised Table 1 to include first anal intercourse before 15 years of age as a categorical variable.

2. Comment: Table 4 and 5 reported factors associated with four and eight month's retention rate, respectively. The results of these two tables were not similar. Authors should tell readers why to use two individual tables, the differences between them, and try to explore reasons of differences.

Reply: The discussion of factors associated with loss to follow-up has been revised as follows:

In our study, the retention rate was lower than in previous cohort studies implemented among general MSM in Beijing (86.2% in 2007, 86.8% in 2009).^{25, 26} From the multiple regression analysis, participants who were less than 25 years old were more likely to be lost at both four-month and eight-month follow-up visits. Similar problems have occurred among studies of young MSM in the US.²⁹ A

plausible reason for this observation was that many young people in China have poor knowledge of safe sexual behaviors. Traditional interventions are more pragmatic but less attractive and appropriate for young people. A qualitative investigation implemented among young MSM in Milwaukee and Detroit offered some new approaches, such as embedding HIV prevention efforts in the context of broader life and relationship issues facing young MSM.³⁰ As differences almost certainly exist between young Chinese and American MSM, predictors of retention among young MSM in Beijing deserve further investigation.

As for positive predictors, we found those who had been in Beijing for more than one year or who had received lubricant were more likely to be maintained in this cohort both in four-month and eight-month follow-up visits. As the services provided by communities, we found similar results as those in Yangzhou.⁸ Migrant MSM who stay longer in Beijing may have more chances to receive effective and stable intervention services, and their potential impact on increasing awareness of self-protection would encourage them to pay closer attention to advances in research. As a result, migrants may be more likely to remain with the investigation to show their support. However, the data showed that receiving voluntary counseling and testing (VCT) service in the past 12 months was a positive factor at four-month follow-up visit, which was replaced by receiving lubricant at eight-month visit. This indicates that factors associated with retention rate may change as time goes on. In other words, different factors may have unique impact on retention rate in different periods, which implies that we should adjust methods for intervention in time so as to keep the entire cohort more stable. From the results of our study, the coverage of intervention on this population was limited. Aimed at the mobility problem inherent to migrant populations, a specific strategy of intervention aimed at migrant MSM is imminently needed.

Discussion:

Comment: should be reorganized to focus on key points, not just listing similarities with other researches. Comments should be based on the results from tables.

Reply: We have revised the Discussion section to more directly address the results presented in the tables.

Part C (Reviewer: 3)

1. Comment: Some of the statistics and references are not up-to-date. Authors should provide the latest statistics.

Reply: We have revised the manuscript to include more recent statistics.

2. Comment: Some of the expressions were not correct and unclear.

(1) MSM is a population but not a mode of transmission, author should use 'homosexual transmission' or 'male-to-male sexual contact' instead of 'MSM transmission'.

Reply: The phrase has been changed to read "homosexual transmission."

(2) It is not clear what does 'social and sexual mixing' mean.

Reply: The sentence has been rephrased as follows: "In recent years, there is growing awareness that internal migration within China may be shifting the HIV epidemic by broadening social integration and connecting populations from different regions through sexual activities."

(3) HIV/AIDS cases from the cumulative data were from domestic provinces. What does 'domestic' mean?

Reply: The sentence has been revised as follows: "Data from national behavioral surveillance during 2004-2005 showed that migrant HIV/AIDS cases accounted for more than 50% of total infections in nine mainland provinces."

(4) "At least two different and current contact sources" – Does it mean the two last sexual contacts?

Reply: This refers to two methods for contacting the participant. We have rephrased the sentence to clarify the meaning.

3. Comment: Did authors also consider the duration of migration or the length of staying in Beijing for the recruitment criteria? Did foreigners fall into the selection criteria?

Reply: Though we considered the duration migrant MSM stayed in Beijing and take it as a variable in our study, the quality of this statistics was not as good as expected. No foreigner was recruited in the cohort. The Study Design section has been revised to clarify that “Participants were all Chinese citizens and were recruited through three methods.”

4. Comment: Authors only excluded HIV positive individuals at the beginning but not those with syphilis. It is not correct to calculate syphilis incidence if there are any syphilis positives at the beginning of the study.

Reply: In consideration of the curability and repeatability of syphilis infection, participants who were syphilis-positive at baseline were still recruited in the cohort. Syphilis incidence density was calculated based on a Poisson distribution, with number of seroconversion incidents within the follow-up period as the numerator and person-years (PY) over the entire follow-up period as the denominator.

5. Comment: The incidence of HIV and STI should be highly associated with the condom use but condom use was not examined in both univariate and multivariate analyses. The study factors in the univariate model for HIV and syphilis are different, it is not clear how authors identified the variables in the univariate models. Authors should provide more details on this section.

Reply: We examined condom use in the univariate analyses but found no significant association. This is most likely due to the high popularizing rate of condom among HIV infectors in our study; Table 2 and Table 3 showed factors entered into the multivariate Cox proportional hazard regression model, which were significant only in the univariate analysis. This is why they are different in the two tables.

6. Comment: Are there any data on the incidence of HIV-syphilis co-infection?

Reply: We have added the following line to the Results on page 8: “Six HIV seroconversions were observed becoming syphilis-positive over 52.10 person-years, resulting in an incidence of co-infection of 11.52 per 100 PY (4.23 to 25.07).”

VERSION 2 – REVIEW

REVIEWER	Li Ling Sun Yat-sen University, China
REVIEW RETURNED	11-Jul-2014

GENERAL COMMENTS	<p>The authors revised this manuscript substantially according to reviewers' comments. However, there are still some places need to modify.</p> <ol style="list-style-type: none"> 1. The method of deciding sample size should be introduced in the METHODS Part, not just being described in response letter. As the author said in INTRODUCTION that “Retention of these cohort studies can hardly maintain over 70% at 12-months follow-up”, why did the author increased sample size by only 10%? 2. The reason of why the author followed up at 4 and 8 months did not make sense. Another question is the time duration of measuring risk behaviors in follow-up every 4 months was “in the past 6 months”, how author resolve the overlap of time durations? 3. The author mentioned bisexual MSM were more likely to be lost follow-up, and discussed this may be caused by disclosing MSM behaviors to their female partners. To prove the hypothesis, it would be make sense to replace sex orientation by “married status” or “having female partner”. 4. There were 547 participants in the title of Table 1, but the overall number was 511 in Table 1. 5. Some words in DISSCUSSION are hard to understand, such as
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	Page 15 Line 3 to 5. 6. Page 15 Line 31 to 33, the conclusion that “different factors may have a unique impact on retention rate in different periods” should be made cautiously.
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REVIEWER	Eric P.F. Chow Monash University, Australia
REVIEW RETURNED	16-Jul-2014

GENERAL COMMENTS	The authors have addressed essentially all of my previous concerns.
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VERSION 2 – AUTHOR RESPONSE

1. The method of deciding sample size should be introduced in the METHODS Part, not just being described in response letter. As the author said in INTRODUCTION that “Retention of these cohort studies can hardly maintain over 70% at 12-months follow-up”, why did the author increase sample size by only 10%?

Reply: We have expanded the METHODS part as follows: “We calculated the sample size using the equation $n = (Z\alpha \cdot (2 \cdot p \cdot q)^{1/2} + Z\beta \cdot (p_0 \cdot q_0 + p_1 \cdot q_1)^{1/2})^2 / (p_1 - p_0)^2$, where α and β are 0.05 and 0.10 and the corresponding $Z\alpha$ and $Z\beta$ are 1.96 and 1.282. p_0 represents the prevalence of HIV among general MSM in Beijing, which was set at 0.02 according to the estimations of the HIV epidemic in 2012 and 2013 in Beijing; p_1 represents the HIV prevalence among migrant MSM in Beijing, which was estimated to be higher than p_0 as 0.06, so the n was calculated to be 502. Considering the possibility of loss to follow-up, we increased the target sample size by 10%.”

According to our former studies, increasing the sample size can counterbalance the effect of loss to follow-up at a limited level, but too much increase in sample size may lead to unpredictable problems for the study. Also, increasing the sample size by 10% is the standard for similar studies in Northern China and adjacent areas. As a result, we decided to increase the sample size by 10%.

2. The reason of why the author followed up at 4 and 8 months did not make sense. Another question is the time duration of measuring risk behaviors in follow-up every 4 months was “in the past 6 months”, how author resolve the overlap of time durations?

Reply: Actually, at the beginning of the study we originally planned to follow up participants at six months and twelve months. However, considering that most migrant MSM tend to leave Beijing from the Spring Festival till the Lantern Festival (approximately two weeks), which might influence our investigation, we decided to change the follow-up duration to four and eight months after finished most of our baseline investigation in early September 2009. Also, because migrants in Beijing are more likely to change residence than migrants in other regions, shorter follow-up durations may help reduce the rate of loss to follow-up to some degree.

Regarding the overlap of time durations - we queried participants about their risk behaviors “since the last investigation” instead of “in the past 6 months” when investigating, but did not revise the descriptions in the manuscript. We have revised the expressions where necessary now.

3. The author mentioned bisexual MSM were more likely to be lost follow-up, and discussed this may be caused by disclosing MSM behaviors to their female partners. To prove the hypothesis, it would be make sense to replace sex orientation by “married status” or “having female partner”.

Reply: We have replaced these words where necessary.

4. There were 547 participants in the title of Table 1, but the overall number was 511 in Table 1.

Reply: We apologize for the confusion. The figure in the title of Table 1 is now consistent with the

figure in table.

5. Some words in DISCUSSION are hard to understand, such as Page 15 Line 3 to 5.

Reply: We have modified this part so it should be more readable now.

6. Page 15 Line 31 to 33, the conclusion that “different factors may have a unique impact on retention rate in different periods” should be made cautiously.

Reply: We have deleted this sentence to avoid making an inaccurate conclusion.