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Population-based sexual behavior surveys in China: Liuzhou compared with other prefectural cities

Huang Yingying, PhD¹, Laurie Abler, PhD², Pan Suiming, MA¹, Gail E. Henderson, PhD³, Wang Xin, PhD⁴, Yao Xingliang⁵, and William L. Parish⁶

¹Department of Sociology, Institute of Sexuality and Gender, Renmin University of China, Beijing, China

²Duke Global Health Institute, Duke University, Durham, NC

³Department of Social Medicine, UNC School of Medicine, Chapel Hill, NC

⁴School of Philosophy and Social Development, Shandong University, Shandong, China

⁵Harbin Engineering University, Harbin, Heilongjiang, China

⁶Sociology Department, University of Chicago, Chicago, IL

Abstract

Sexual behaviors in China are rapidly changing; simultaneously, STI/HIV prevalence is increasing in the general population. To investigate these major shifts, we examined sexual behaviors and self-reported sexually transmitted infections (STI) in one prefectural city in southern China, Liuzhou, and compared it to other prefectural cities throughout China. We used adults age 18-39 from two sets of population-based surveys that paralleled each other in both content and method. The first set was the Liuzhou survey conducted in 2008 (n=398). The second set consisted of two national surveys collected in 2006 and 2010 (n=2186). Liuzhou respondents reported more active social and sexual behaviors than their national counterparts, including more socializing, dancing, drinking excessively, sexual activity among never married men and women, purchasing commercial sex among men, one-night stands among men, multiple sexual partnerships and self-reported STI among both men and women. Women in Liuzhou reported greater sexual risk behavior than their national counterparts, although overall they reported less than their male counterparts; they were also more likely to have had an abortion than women in other prefectural cities. Our findings provide a comprehensive overview of the sexual context of Liuzhou among the general population, which may help explain the greater STI/HIV prevalence in Liuzhou.

Introduction

Sexuality and sexual transmission in China

Over the last 30 years, Chinese society has experienced rapid changes in sexual behaviors, relationships, and norms, due in part to transformations associated with the economic reforms of the late 1970s¹⁻⁵. Numerous indicators of relaxed sexual practices have characterized this sexual revolution. The national prevalence of multiple sexual partnerships significantly increased from 16.8% in 2000 to 25.3% in 2006⁴, compared to approximately 6% in the 1980s⁶. In 2000, 32.9% of people reported having premarital sex, which

Corresponding author: Laurie Abler Duke Global Health Institute Duke University 333 Trent Hall, Trent Drive Box 90519 Durham, NC 27708 (919) 613-6125 laurie.abler@duke.edu.

Note

significantly increased to 43.5% in 2006⁴. Extra-marital sex significantly increased from 13.2% in 2000 to 19.1% in 2006⁴. In 2000, 16.9% of college students reported having sex and the number nearly doubled (32%) in 2006⁴. This sexual revolution has occurred in various demographic categories including men and women, urban and rural populations, and the young and old, although the rate of increase has varied among the different groups⁴.

The prevalence of sexually transmitted infections (STI) in China, especially HIV, has been increasing in tandem with the sexual revolution. As of 2011, an estimated 780,000 Chinese citizens were living with HIV⁷. Infection via heterosexual sex accounted for 62% of new HIV cases in 2011, compared to 32% in 2006⁷, indicating that sexual transmission has replaced drug use as the main mode of HIV transmission. This change in mode of transmission increases the likelihood that HIV will spread into the general heterosexual population⁶. In addition, the significant increase of STI provides evidence of greater sexual risk behaviors as a part of the sexual revolution⁸⁻¹⁰. Research is urgently needed on sexual practices and behaviors in contemporary Chinese society in order to understand and mitigate the potential spread of STI and HIV into the general population.

Although many studies have focused on STI/HIV risk among high-risk groups – such as female sex workers (FSW), men who have sex with men (MSM), and injection drug users (IDU) – few have studied sexual behaviors and relationships among the general population in China^{9,11,12}. Further, we lack the population-based information necessary to understand the factors associated with site-specific STI/HIV epidemics. Our research in Liuzhou City investigating the sexual and behavioral contexts of the high prevalence of STI/HIV provides a much needed opportunity to explore the unfolding Chinese sexual revolution in Liuzhou in comparison to similar locations across China.

Liuzhou and HIV/STI

Liuzhou is a prefecture level city^a in Guangxi Province, southwest China, with an urban population of 1.4 million. Located near the borders of Myanmar (Burma), Vietnam, and Laos, Liuzhou is situated along a major drug trafficking route for Southeast Asia. Liuzhou is also notable as a transportation hub and a center of Chinese tourism and manufacturing, especially for the automobile industry. While there is a significant Zhuang ethnic minority, the majority Han ethnic group comprises more than half of the urban population¹³.

Liuzhou has one of the highest STI and HIV prevalence rates in China. Since the start of the HIV epidemic in the late 1980s, Guangxi Province has reported the second-highest cumulative number of people living with HIV (PLHIV) for all Chinese provinces⁷. Liuzhou and its six surrounding county towns, reported 7,524 total HIV cases in 2007, nearly 10,000 by 2009, and approximately 11,300 in 2012. In 2008, HIV/AIDS surveillance in Liuzhou reported that the prevalence rate among IDU remained high (15.5%)¹⁴. Nevertheless, other studies have shown that the mode of transmission has been shifting from high risk groups to the general population⁷. For example, while the HIV prevalence among FSW remained modest (1.3% in Liuzhou in 2008 and less than 1% nationally in 2011)¹⁴, data collected from 583 FSW in Liuzhou in 2010 suggest a much higher syphilis prevalence; lifetime prevalence was 8.6% and 4.1% had active syphilis infections¹⁵.

To better understand sexuality and sexual risk behaviors in Liuzhou City and throughout China, this study focused on factors associated with the sexual transmission of STI/HIV by

^aAdministratively, “prefectural level cities” sit midway between the provincial capitals and the counties and county-level cities below them. The data described in this study draw only from the urban core (*shiqu*) of these administrative regions, and not from the surrounding rural hinterland in each prefecture. Nationwide, there were 284 prefectural cities in 2011. (See http://www.gov.cn/test/2005-06/15/content_18253.htm)

comparing behavioral survey data among Liuzhou residents with that of residents from other prefectural cities in China. This study also provides contextual information for other research conducted in Liuzhou regarding the sexual transmission of STI/HIV¹⁶⁻²⁵, which is reported in this Special Issue of *AIDS and Behavior*.

Methods

Samples and data collection

The data for this paper are drawn from two sets of population-based surveys that paralleled each other in both substance and method. The first set consists of two national surveys collected four years apart in 2006 and 2010 – thereby straddling the year when the Liuzhou survey was conducted in 2008. The Liuzhou survey is the second survey set used in comparison to the combined national results²⁵⁻²⁷. The three surveys used the same sampling and data collection strategies, with the exception that the 2008 Liuzhou data was restricted to one urban area while the 2006 and 2010 national surveys were collected in multiple regions throughout China. The decision to combine the 2006 and 2010 national surveys was based on two assumptions: first, that the shared sampling strategy for both the 2006 and 2010 surveys produced samples that were comparable in demographic factors, such as marital status, education, occupation, and migrant status; and second, that sexual behaviors (and the willingness to report these behaviors) were changing rapidly during the last decade and that an average of 2006 and 2010 conditions would better approximate the national sexual environment for comparison with Liuzhou in 2008. Both of these assumptions were tested and the findings are described at the end of the results section.

First, we extracted data on the prefectural cities from the national surveys because these cities are similar to Liuzhou in approximate population size and administrative rank. Second, we limited data from all the surveys to those aged 18-39 because: 1) this age range captures the group most exposed to the rapid economic and social change of the previous two decades; and 2) empirical exploration of the survey data revealed that cumulative (lifetime/ever) measures of sexual behavior (multiple sexual partners, swapped sexual partners, one night stands) typically peaked at or before age 40.

All of the surveys used a shared multi-stage sampling strategy. Based on census and local administrative data, probability proportional to size (PPS) samples were made of primary sampling units (PSUs) and then lower level administrative units. The probabilistic selection continued with the selection of households and then individuals within the household. Households were selected from the regular household registration list in each residents' committee (*juweihui*) and the administrative list of migrants (and from a census of migrant residences/work places when the administrative migrant list was unavailable)^{9,26}.

Specifically, the urban portion of the 2006 and 2010 national surveys selected 75 PSUs at the urban district/town level and, then, secondary sampling units at the neighborhood (*jiedao*) and residents' committee (*juweihui*) levels. From the total of all urban PSUs selected in 2006 and 2010, 25 PSUs were identified as prefectural-level cities, each including subsamples of residents' committees and households. For the 2008 survey of urban Liuzhou, we drew a PPS sample of 8 PSUs (neighborhoods), followed by PPS sampling of 3 residents' committees in each of the neighborhoods, for a total of 24 residents' committees^{9,26}.

Participants provided informed consent and took part in an hour-long computer-assisted personal interview (CAPI), conducted by trained interviewers who were supervised by the first and fifth authors. To reduce reporting bias, interviews were conducted on respondent-controlled computers, with support from interview staff of the same gender to reduce

discomfort. To ensure privacy, interviews took place in private locations, typically hotel rooms or a local meeting facility. In the interview, respondents provided basic demographic information with direct assistance from the interviewer as a form of CAPI training before answering more sensitive questions alone. The interviewer remained in the room, seated across from the respondents for the duration of the survey to provide assistance as necessary ²⁶.

The effective response rates were 71.5% for the 2006 and 72.1% for the 2010 national surveys and 70.5% for the Liuzhou survey. The sample size for the population of 18-39 year olds was 2,186 (1101 men and 1085 women) in the prefectural-level urban areas from the combined national datasets and 398 (177 men and 221 women) for the Liuzhou dataset. All surveys were conducted by the same research team from the Renmin University Institute for Research on Sexuality and Gender. The research was approved by the IRB at Renmin University.

Measures

Studies in China have yet to provide strong correlates between sexual behavior and social conditions. A few have examined the sexual activities such as multiple sexual relationships, extra-marital sex, or commercial sex; background conditions such as marital status (including cohabitation status), education level, social status, and migration; and social activities such as dancing, full body massage, alcohol use, and traveling ^{9,28-30}. Based on the existing literature, we selected three domains for this paper: 1) socio-demographic variables, 2) social activities and opportunities for sexual partnerships, and 3) sexual behaviors, including self-reported STI in a respondent's lifetime.

First, five dichotomous variables were included under the *social and demographic* domain: 1) gender (0=female, 1=male), 2) age (0=30-39, 1=18-29), 3) education (0=below high school, 1= high school and above), 4) migrant status (0=non migrants, 1=migrants, including both migrating from rural to urban and urban to rural areas), 5) occupation (0=non-white collar, 1=white collar, broadly defined to include sales/services and self-employed merchants/workers). As marriage is closely related to sexual behavior, we analyzed it in more detail, specifying single (0=no, 1=yes), cohabitating (0=no, 1=yes), and currently married statuses (0=no, 1=yes).

Second, factors related to *social activity*, as key indicators of social and leisure life, included six dichotomous variables: 1) having one or more close opposite-sex friend; 2) socializing at least weekly in the last 12 months, defined as socializing (eating, drinking, etc.) outside the home with people other than family members or spouse; 3) enjoyment of socializing; 4) dancing in the last year, defined as going out dancing at an entertainment venue where one has to pay an entrance fee; 5) body massage, defined as ever paying for a non-sexual full body massage by a member of the opposite sex in the last year; and 6) drinking excessively ("frequently getting drunk") in the last 12 months.

Third, *sexual behavior* was examined broadly with eight dichotomous variables: 1) watched pornography, defined as ever having watched pornography in the last 12 months via website, pictures, and video depicting detailed sexual behavior; 2) having had sex with anyone in one's lifetime; 3) pre-marital sex among never married people; 4) ever having had a one night stand (*yiyeqing*) relationship in one's lifetime ¹⁶; 5) having had more than one sexual partners in one's lifetime, except in the case of remarriage; 6) for those who reported being in a relationship, knowing or suspecting their current partner has ever had a concurrent sex partner; 7) ever visiting female sex workers in one's lifetime (males only); and 8) swapping (or swinging) sexual partners, defined as exchanging of sexual partner or consensual non-monogamy among partners over one's lifetime. In addition, lifetime self-reported STI and

women's lifetime abortion experience were also included as factors related to sexual and reproductive health.

Statistical Analysis

The demographic data for respondents from the Liuzhou and the two national surveys were compared to the urban age and gender distributions from the 2010 national census in order to produce separate post-stratification population weights for each survey. The final data sets required particularly large weights based on two characteristics. First, all three surveys required extra weighting for young adults aged 18-29, because these individuals were more likely to migrate — both from rural to urban and within cities²⁶. Second, males in Liuzhou required weights approximately 25% larger than for females, because of lower response rates for males in Liuzhou.

Once post-stratification weights were determined and the 2006 and 2010 national surveys were combined, we used Stata 11.2 to compare percentages of characteristics of the Liuzhou sample with the combined national sample. With standard errors in statistical tests adjusted by Huber-White corrections for sample clusters, we reported significant results at the levels of $p < 0.10$ through $p < 0.01$ ²⁶.

Results

Social-demographic characteristics

Liuzhou respondents shared similar social demographic characteristics with individuals in other prefectural cities for most of the variables listed in the first part of Table 1. The significant differences between Liuzhou and other prefectural cities in China were found on cohabitation status, high school education and migration. Liuzhou had slightly more respondents cohabitating with a non-spousal partner (9.9% vs. 6.7% in other prefectural cities, $p < 0.1$; and among women, 8.7% vs. 4.9%, $p < 0.1$). Respondents in Liuzhou were slightly better educated than the national respondents, with more Liuzhou respondents educated through high school or beyond (70.9% vs. 65.8% in other prefectural cities, $p < 0.1$; and among women, 70.9% vs. 63.3%, $p < 0.05$). The Liuzhou survey had somewhat fewer migrants (male and female) than the national survey (17.2% vs. 25.0% among men, $p < 0.10$; 21.5% vs. 26.2% among women).

Social activities

Although Liuzhou respondents reported higher percentages on all the social activities listed in Table 1 – thus suggesting a more active social life – significant differences were found only on socializing, dancing and drinking. More Liuzhou respondents, especially women, reported liking to socialize “very much” (37.8% vs. 28.2% among women, $p < 0.01$). In practice, 47.9% of Liuzhou men reported socializing (drinking, eating, etc.) with friends at least once a week, which was a significantly higher proportion than in other cities (37.2%, $p < 0.05$); similarly, women in Liuzhou reported significantly higher socializing on a weekly basis than other cities (30.2% vs. 23.2%, $p < 0.1$). Going out dancing occurred frequently everywhere, though more commonly in Liuzhou (45.9% vs. 40.4%, $p < 0.1$). Considerably more Liuzhou men than those in other cities reported drinking excessively in the last year (60.2% vs. 40.7%, $p < 0.01$).

Sexual behaviors and health

Table 1 also presents the differences in sexual behaviors and health outcomes in Liuzhou compared to other prefectural cities in China. In general, Liuzhou respondents were more likely to report higher active sexual lives compared to people in other cities; almost all of these variables had a higher prevalence in Liuzhou and significant differences between

Liuzhou and other prefectural cities, except for watching pornography (54.9% in Liuzhou, vs. 52.0%) and partner swinging (2.7% in Liuzhou, vs. 2.6%). Among the respondents, 88.9% of those in Liuzhou reported ever having sex compared to 80.8% in other cities ($p<0.01$), and the differences were stronger for women (89.3% vs. 78.4%, $p<0.01$). Among those who had never married, a greater proportion of men and women in Liuzhou reported being sexually active than in other prefectural cities (40.2% vs. 29.7% among men, $p<0.05$; 26.9% vs. 16.1%, among women $p<0.01$). Approximately one-fifth of men in Liuzhou reported ever having had a one night stand, which was significantly higher than other cities (19.6% vs 12.9%, $p<0.01$). More men and women in Liuzhou had more than one sexual partnership in their lifetime (66.3% vs. 57.2% among men, $p<0.1$; 47.4% vs. 37.1% among women, $p<0.1$). More men in Liuzhou knew or suspected their partner had a concurrent partner (30.4% vs. 19.6%, $p<0.1$). In total, 18.6% of Liuzhou men had visited female sex workers over their lifetime, compared to 13.4% in other cities ($p<0.01$). Among the two health related variables, half of the Liuzhou women reported they ever had an abortion, which was significantly higher than other cities (51.0% vs. 39.5%, $p<0.01$). Both men and women in Liuzhou reported a higher percentage of STI in their lifetimes (7.3% vs. 3.7% among men, $p<0.1$; 4.4% vs. 1.7% among women, $p<0.1$).

Additional statistical checks on the national data

We also checked whether the combination of the 2006 and 2010 national survey results might have introduced unintended biases. In these checks, we found that the distribution of socio-demographic factors was similar; none of the socio-demographic factors differed significantly (at the $p<0.05$ level) between the two years. This is consistent with our assumption that both samples were comparable and could be combined on the basis of similar background characteristics of the respondents.

As expected, between 2006 and 2010, there was much less stability for the remaining items in Table 1. Fourteen items on social activities and sexual behavior were surveyed for both years in the national surveys (“likes socializing” and “drank excessively” were asked only in 2010). Of the fourteen items from both years, ten were significantly more common in 2010 (at $p<0.05$) – namely having opposite sex friend(s), dancing, receiving a massage, watching porn, having sex ever, having sex ever even though never married, having one-night stands, having multiple lifetime sexual partners, visiting female sex workers, and swinging or partner swapping. An example is that the percentage of men reporting female sex worker visits increased from 10.2% in 2006 to 16.5% in 2010—producing the 13.4% reported in Table 1. Only four items from 2006 and 2010 were statistically no different across both years – namely, socialized at least weekly, knew or suspected a partner had a concurrent sexual partner, had an abortion ever, and had an STI ever. The marked increase in social and sexual behaviors between 2006 and 2010 is consistent with the assumption that the two years of national data could be combined to approximate the 2008 conditions in Liuzhou.

Discussion and conclusion

In this paper, we compared the socio-demographic characteristics, social activities, and sexual behaviors among young adults aged 18-39 in Liuzhou to young adults in 25 similar prefectural cities drawn from probability samples throughout China. Given the rapid changes in sexual behaviors and relationships in China¹⁻⁴, these findings are consistent with evidence that a sexual revolution is ongoing in China and that the general population engages in notable sexual risk behaviors that have the potential to facilitate the sexual transmission of STI/HIV if prevention efforts are not developed and implemented⁶.

We have shown that the socializing behaviors reported in several other papers in this Special Issue^{16,21} are very common in Liuzhou. These include socializing with friends, going out

dancing, engaging in one-night stands, and drinking alcohol. In particular, the two articles by Weir and colleagues^{18,19} demonstrate that entertainment venues are risky locations for developing both commercial and non-commercial sexual partnerships, as these venues facilitate sexual activities^{3,16}. In this paper, we document associations rather than direct causal links between greater socializing and STI/HIV risk. However, qualitative research in this Special Issue, in articles by Wang and colleagues²¹ and Zhang and colleagues¹⁶, provide compelling depictions of how socializing activities have the potential to facilitate new sexual partnerships which can in turn lead to increased risk of STI/HIV transmission. Liuzhou residents report more sexual behaviors, on average, than other prefectural cities with regard to sexual history, commercial sex, one night stands, multiple sexual partnerships, and self-reported STI. Other research in China provides evidence for the relationship between socializing and risk of STI; in one study, frequent socializing among males was associated with higher prevalence of chlamydial infection⁹.

Surveillance data on the HIV epidemic in China documents the rise of HIV infections among people whose only reported risk behavior is unprotected sex^{6,27}. Thus, higher levels of active sexual and social behaviors in the general population of Liuzhou may help to explain its higher HIV prevalence. This relationship has been shown in other settings, where even slight rises in sexual risk behaviors in the general population have been associated with increased HIV infections³¹. The high rate of self-reported STI in Liuzhou among both men and women also increases the potential for HIV transmission.

Coinciding with other emerging efforts to understand how sexual behaviors and relationships among the general population influence the HIV epidemic in China^{9,32}, our paper highlights the importance of re-considering HIV prevention messages and efforts among sexually active populations previously labeled "no-risk." These individuals from the general population need to be studied to understand how their sexual risk behaviors have the potential to bridge transmission from the typical "high-risk" populations to those considered "low-" or "no-risk". In other words, it is not only groups at high-risk such as IDU, FSW and MSM that have the potential to drive the high prevalence rates of STI/HIV in Liuzhou and other parts of China. Because people who have previously been categorized as "no risk" may not identify with the labels attached to groups at high-risk, it is unlikely that STI/HIV prevention messages, which predominantly target high-risk populations, are being internalized and followed by the general population. Our findings support the need for broadened prevention efforts that move away from simply isolating and separating so-called high risk groups, but towards creating comprehensive STI/HIV prevention programming for the general population. Developing and implementing such interventions is urgently needed.

This paper presents descriptive survey data from Liuzhou and other prefectural cities in China. It offers a general picture of the social and sexual context of the city in Southwest China which is the focus of research in this Special Issue. We recognize that descriptive results cannot fully explain why certain sexual behaviors are more prevalent, nor can the presence of these sexual behaviors be directly linked to greater risk of STI/HIV in Liuzhou compared to other prefectural cities. Some important data are not available. In particular, we do not report data on the frequency of unprotected sexual acts nor did our sample capture enough MSM, FSW, or IDU to describe their impact on higher rates of STI and HIV in Liuzhou. A more in-depth analysis of the sexual context would provide comprehensive models that explore how sexuality, condom use, and self-reported STI are linked to the risk of HIV transmission, issues which other research in Liuzhou, reported elsewhere in this Special Issue, is beginning to explore^{16,17,19-21}. Liuzhou's sexual culture may be partially explained by residents' active social life. Further, broader contextual factors in Liuzhou – such as the high level of social mobility¹³, the bordering drug trade area, and migrant cultures living away from home^{17,21} likely facilitate opportunities for Liuzhou residents to

engage in sexual risk behaviors and expand their sexual networks. An individual's potential risk of STI/HIV should be positioned within the social and cultural contexts of Liuzhou, that is, its risk environment³³. Other studies demonstrate the important contribution of the risk environment to STI/HIV transmission^{34,35}; however, the existing literature is not developed sufficiently to explain the relationships between local social contexts, sexual culture and STI/HIV risks.

It is notable that Liuzhou governmental and non-governmental officials have undertaken many efforts to address the STI/HIV epidemics. For example, the local Liuzhou CDC has developed numerous outreach programs to target high risk groups, including programs to educate FSW, distribute condoms in sex work venues, provide needle exchange and methadone treatment for IDU, and increase promotion of and access to testing and treatment centers for STI/HIV. We believe that future prevention programs that target sexual behaviors and relationships within the general population have the potential to contribute to greater effectiveness in reducing STI/HIV prevalence in Liuzhou. Promising avenues to reach young adults in the general population might include using new media such as the internet and smartphones, which are popular in Liuzhou and other cities, to launch comprehensive sexuality programs; developing attractive games to distribute health information; or using popular TV shows to focus on sexual risks and sexual contexts in China.

This study has several important limitations. Despite our efforts to create valid comparisons, the differences between the two datasets may have weakened the comparisons. Even though our study team was experienced at conducting sexuality surveys, there may have been differential bias in self-reported data, with Liuzhou respondents being more open to answering sexuality questions than individuals in other cities. Lack of comparative data across the three surveys on drug use, condom use, as well as lower response rates for men and young people of both sexes also created obstacles for analysis. More complex modeling to analyze data in Liuzhou and in-depth ethnographic and epidemiological research is needed to understand the determinants of sexual transmission of STI/HIV among the general population in Liuzhou. While this paper provides some evidence that increased sexual risk behaviors were present in Liuzhou, without comparative data on rates of unprotected sex and other key factors, defining the drivers of the epidemics in Liuzhou compared to other prefectural cities awaits further study.

Despite these limitations, this paper provides the first data of its kind to describe sexual behaviors and partnerships in the general population in a high risk area. The results provide insights into the sexual contexts in Liuzhou. They highlight the prevalence of risk behaviors in the general population that have the potential to bridge STI/HIV transmission from groups at high risk, and bring attention to the need for STI/HIV programs targeting the general population to prevent a generalized epidemic.

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References

1. Pan, S.; Parish, WL.; Wang, AL. Chinese Peoples' Sexual Relationship and Sexual Behavior (Zhongguoren de Xing Guanxi yu Xing Xingwei 1999-2000). Social Science Document Publishing House; Beijing: 2004.
2. Parish WL, Laumann EO, Mojola SA. Sexual behavior in China: Trends and comparisons. *Popul Dev Rev.* 2007; 33(4):729–756.
3. Farrer, J. *Opening up: Youth sex culture and market reform in Shanghai.* University of Chicago Press; Chicago: 2002.
4. Pan, S. *The Accomplishment of a Sexuality Revolution in China-- Preliminary Report of a Comparison Study between 2000 and 2006.* Universal Press; Gaoxiang: 2008.
5. Xiao Z, Mehrotra P, Zimmerman R. Sexual revolution in China: implications for Chinese women and society. *AIDS care.* 2011; 23(sup1):105–112. [PubMed: 21660756]
6. Ministry of Health, People's Republic of China, Joint United Nations Programme on HIV/AIDS, World Health Organization. 2009 Estimates for the HIV/AIDS Epidemic in China. Beijing, China: May 31. 2010
7. Ministry of Health People's Republic of China, Joint United Nations Programme on HIV/AIDS, World Health Organization. 2011 Estimates for the HIV/AIDS Epidemic in China. National Center for AIDS/STD Control and Prevention, China CDC; Beijing, China: Nov. 2011 2011
8. Tucker JD, Chen XS, Peeling RW. Syphilis and social upheaval in China. *New England Journal of Medicine.* 2010; 362(18):1658–1661. [PubMed: 20445179]
9. Parish WL, Laumann EO, Cohen MS, et al. Population-based study of chlamydial infection in China. *JAMA.* 2003; 289(10):1265–1273. [PubMed: 12633188]
10. Chen XS, Peeling RW, Yin YP, Mabey DC. The epidemic of sexually transmitted infections in China: implications for control and future perspectives. *BMC Med.* 2011; 9:111. [PubMed: 21975019]
11. Luo Y, Parish WL, Laumann EO. A population-based study of childhood sexual contact in China: Prevalence and long-term consequences. *Child Abuse Negl.* 2008; 32(7):721–731. [PubMed: 18614231]
12. Parish WL, Wang T, Laumann EO, Pan S, Luo Y. Intimate partner violence in China: National prevalence, risk factors and associated health problems. *Int Fam Plan Perspect.* 2004:174–181. [PubMed: 15590383]
13. Liuzhou Municipal Bureau of Statistics. *Liuzhou Economic Statistical Yearbook —2009.* China Statistical Press; Beijing, China: 2010.
14. Li M. HIV surveillance data analysis of Liu Zhou City in 2008. *J Prev Med Inf.* 2010; 26(5):363–366.
15. Li J, Chen XS, Merli MG, Weir SS, Henderson GE. Systematic differences in risk behaviors and syphilis prevalence across types of female sex workers: a preliminary study in Liuzhou, China. *Sex Transm Dis.* Mar; 2012 39(3):195–200. [PubMed: 22337106]
16. Zhang N, Abler L, Bao Y, Pan S. Understanding the meaning of short-term, yiyeqing relationships and how they are formed: Implications for condom use in Liuzhou, China. *AIDS Behav.* 2013:1–9. [PubMed: 23054037]
17. Liu Q, Kongshao Z, Quzhen S, et al. The organization of sex work in low and high-priced venues with a focus on the experiences of ethnic minority women working in these venues. *AIDS Behav.* 2013:1–9. [PubMed: 23054037]
18. Weir SS, Li J, Edwards JK, et al. Exploring venue-associated risk: A comparison of multiple partnerships and syphilis infection among women working at entertainment and service venues. *AIDS Behav.* 2013:1–8. [PubMed: 23054037]
19. Weir SS, Pan S, Huang Y, Zhang N, Gandhi AD, Chen X. Characteristics of venue-based non-commercial one time sex in Liuzhou, China. *AIDS Behav.* 2013 forthcoming.
20. Gu J, Bai Y, Lau JT, et al. Social environmental factors and condom use among female injection drug users who are sex workers in China. *AIDS Behav.* 2013:1–11. [PubMed: 23054037]
21. Wang W, Muessig KE, Li M, Zhang Y. Networking activities and perceptions of HIV risk among male migrant market vendors in China. *AIDS Behav.* 2013:1–10. [PubMed: 23054037]

22. Abler L, Henderson GE, Wang X, Avery M, Zhang YX, Pan S. Affected by HIV Stigma: Interpreting results from a population survey of an urban center in Guangxi, China. *AIDS Behav.* 2013:1–10. [PubMed: 23054037]
23. Hua J, Emrick CB, Golan CE, et al. How people living with HIV in Liuzhou, China, experience stigma. *AIDS Behav.* 2013 in preparation.
24. Zhang Y, Brown JD, Muessig KE, Xianxiang F, Wenzhen H. Sexual health knowledge and health practices of female sex workers in Liuzhou, China, differ by size of venue. *AIDS Behav.* 2013:1–9. [PubMed: 23054037]
25. Zhang YX, Bu J, Golin CE, Emrick CB, Nan ZN, Li M-Q. Coping strategies for HIV-related stigma in Liuzhou, China. *AIDS Behav.* 2013 forthcoming.
26. Pan S, Parish WL, Huang Y. Clients of female sex workers: A population-based survey of China. *The Journal of infectious diseases.* 2011; 204(suppl 5):S1211–S1217. [PubMed: 22043034]
27. Yao X, Wang H, Yan P, et al. Rising epidemic of HIV-1 infections among general populations in Fujian, China. *J Acquir Immune Defic Syndr.* 2012; 60(3):328–335. [PubMed: 22343181]
28. Huang Y, Smith K, Suiming P. Changes and correlates in multiple sexual partnerships among Chinese adult women—population-based surveys in 2000 and 2006. *AIDS Care.* 2011; 23(sup1): 96–104. [PubMed: 21660755]
29. Zhang N, Parish WL, Huang Y, Pan S. Sexual infidelity in China: Prevalence and gender-specific correlates. *Arch Sex Behav.* 2012; 41(4):861–873. [PubMed: 22544304]
30. Yang X, Luo H. Migration, urbanization, and drug use and casual sex in China: a multilevel analysis. *Environ Plan A.* 2009; 41(3):581.
31. Siriwasin W, Shaffer N, Roongpisuthipong A, et al. HIV prevalence, risk, and partner serodiscordance among pregnant women in Bangkok. *JAMA.* 1998; 280(1):49–54. [PubMed: 9660363]
32. Merli, MG.; Hertog, S.; Wang, B.; Li, J. Modeling the Spread of HIV/AIDS in China. Center for Demography and Ecology, University of Wisconsin; Madison, WI: 2004.
33. Rhodes, T.; Wagner, K.; Strathdee, SA.; Shannon, K.; Davidson, P.; Bourgois, P. Structural violence and structural vulnerability within the risk environment: theoretical and methodological perspectives for a social epidemiology of HIV risk among injection drug users and sex workers. Springer; *Rethinking Social Epidemiology*: 2012. p. 205-230.
34. Strathdee SA, Lozada R, Martinez G, et al. Social and structural factors associated with HIV infection among female sex workers who inject drugs in the Mexico-US border region. *PLoS One.* 2011; 6(4):e19048. [PubMed: 21541349]
35. Morisky DE, Peña M, Tiglao TV, Liu KY. The impact of the work environment on condom use among female bar workers in the Philippines. *Health Education & Behavior.* 2002; 29(4):461–472. [PubMed: 12137239]

Table 1

Comparison of Liuzhou and national prefectural-level cities (ages 18-39)

Variable	TOTAL (%)		WOMEN (%)			
	N ational	L iuzh al	N ational	L iuzh al	N ational	L iuzh al
<i>Socio-demographic factors</i>	5	5				
Male	1.0	0.0				
Age 18 to 29	5	5	5	5	5	5
Single	7.0	4.7	6.7	3.5	7.3	5.9
Cohabiting	3	3	3	4	3	2
Currently married	5.6	4.7	8.2	0.5	2.8	8.9
High school education or more	6	9	8	1	4	8
White collar occupation (includes sales/service workers & self-employed merchants)	.7	.9	.4	1.2	.9	.7
Migrant (both rural to urban & urban to urban)	5	5	5	4	6	5
<i>Social activities</i>	5.9	3.6	1.7	7.3	0.3	9.9
One or more opposite-sex close friend(s)	6	7	6	7	6	6
^a Likes socializing very much	7.4	8.9	2.1	7.7	2.5	0.1
Socialized (at least weekly last year)	3	4	4	4	2	3
Danced last year	4.6	0.8	0.8	3.8	8.2	7.8 *
Full body massage last year	3	3	3	4	2	3
^a Drank excessively last year (sometimes/often)	0.3	9.1	7.2	7.9	3.2	0.2
Sexual behaviors & health outcomes	4	4	4	5	3	3
Watched porn in last year	0.4	5.9	8.6	5.9	1.9	6.0
Ever had sex with anyone	1	1	2	2	4	3
	5.6	5.7	5.9	7.8	.9	.5
	2	4	4	6	1	2
	8.6	1.8 *	0.7	0.2 *	6.0	1.4
	5	5	6	6	3	4
	2.0	4.9	6.3	7.8	7.1	2.0
	8	8	8	8	7	8
	0.8	8.9 *	3.1	8.6	8.4	9.3 *

Variable	TOTAL (%)		MEN (%)		WOMEN (%)	
	N ational	L iuzh al	N ational	L iuzh al	N ational	L iuzh al
Never-married but have had sex	2 3.1	3 3.6 *	2 9.7	4 0.2	1 6.1	2 6.9 *
One night stand ever	8 .9	1 2.9	1 2.9	1 9.6 *	4 .8	6 .1
Multiple sexual partners lifetime	4 7.3	5 6.8	5 7.2	6 6.3	3 0.8	2 8.5
Partner had concurrent sex partner ever	2 5.3	2 9.5	1 9.6	3 0.4	3 0.8	2 8.5
Visited female sex worker ever (men)			1 3.4	1 8.6		
Swapped partners ever	2 .6	2 .7	3 .6	3 .5	1 .6	2 .0
Had abortion ever (women)					3 9.5	5 1.0 *
STI ever	2 .8	5 .8 *	3 .7	7 .3	1 .7	4 .4
Maximum unweighted observations (n)	2 186	3 98	1 101	1 77	1 085	2 21

Note: +p<.10

p values from logistic regression with t values adjusted for clustering on the PSU.

* p<.15

^a National results only available from the 2010 national survey.