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## Social Contexts of Heterosexual Transmission of HIV/STI in Liuzhou City, China

**Gail Henderson,**

Department of Social Medicine, University of North Carolina School of Medicine, 333 South Columbia St., 347 MacNider, Chapel Hill, NC 27599-7240, USA

**Suzanne Maman,**

Department of Health Behavior, University of North Carolina at Chapel Hill, Chapel Hill, USA

**Yingying Huang,**

Department of Sociology, Renmin University, Beijing, China

**Kathryn Muessig, and**

Department of Health Behavior, University of North Carolina at Chapel Hill, Chapel Hill, USA

**Suiming Pan**

Department of Sociology, Renmin University, Beijing, China

### Abstract

In this special issue of *AIDS and Behavior*, we focus on the social contexts of sexual transmission of HIV/STI in one South China city. Our multiple projects grew from partnerships across the social and biomedical sciences, and with public health experts in Liuzhou City, to address critical gaps in knowledge about how social factors drive heterosexual transmission. The eleven articles that comprise this special issue feature multidisciplinary and mixed method approaches, collecting data in Liuzhou from different populations, environments, and social venues where individuals often find sexual partners. They document heterosexual behaviors and their meanings. They investigate the experiences and behaviors of women and men in social venues, exploring the networks of people within these venues, how they relate to one another, share information, and influence each other. The articles also examine the experiences of people living with HIV, again collecting data from multiple levels and sources, and revealing the ongoing power of stigma to shape these lives. Taken together, the articles demonstrate the critical role of social contexts in shaping behaviors and meanings, which are linked to heterosexual transmission of HIV/STI, and which must be taken into account for the development of appropriate and effective public health interventions.

### Keywords

Social contexts; Heterosexual transmission; HIV; STI; China

## Introduction

Sexually transmitted infections (STI) in China were virtually eradicated during the Communist era under Chairman Mao Zedong (1949–1976), an accomplishment which was only realized as part of a grand program of social and economic control and revolution [1, 2]. In subsequent decades, China’s “open door policy” alongside massive economic growth heralded equally unprecedented social transformations, such that the China of 2013 would be unrecognizable to those who steered its course in the mid-20th century. China’s rigid state-owned economic structures were dismantled in both urban and rural areas, enabling the rise of privately owned farms and businesses, and trade expansion across the country and the world. Internal migration—highly restricted under Mao through household registration—rose exponentially to encompass an estimated 200 million people and has become a key driver of fundamental social and economic change [3]. These changes are visible from the national level, in China’s rapid economic growth and urban development, down to the individual level of increased wealth and widening economic disparities. No aspect of Chinese society is untouched, affecting the formation of personal relationships, family structure, and the norms of social exchange.

In the context of these changes, it is not surprising that STI re-emerged in China in the late 1980s and early 1990s, reaching epidemic proportions by the mid-2000s [4–6]. The re-emergence of STI and a parallel rise in sexually transmitted HIV were documented alongside striking increases in the number of female sex workers and the use of entertainment venues for business and pleasure [7, 8]. As one facet within a broader revolution in sexual behaviors [9], these social and epidemiological contexts threatened to put the HIV/STI epidemics into overdrive. More recently, the role of MSM in HIV transmission has also been revealed [10–12]. By the end of 2011, approximately 780,000 people were living with HIV in China [13], with the main risks of infection shifting from drug use and plasma-selling to sexual transmission. Among documented increases in STI, the most compelling was the extraordinary rise in primary and secondary syphilis infections from less than 0.2 per 100,000 persons in 1993 to 11.7 per 100,000 persons in 2009 [5, 6].

In 2007, our interdisciplinary research team was awarded a 5-year grant from the National Institute for Child Health and Development (R24HD056670, Henderson PI). Its aim was to build research partnerships across the social and biomedical sciences to address critical gaps in knowledge about social factors driving the sexual transmission of HIV and other STI. Our team included investigators from the University of North Carolina at Chapel Hill in Social Medicine, Health Behavior, Epidemiology, Journalism and Mass Communication, and the Institute for Global Health and Infectious Disease. From China, our team included social scientists from the Institute for Sexuality and Gender Studies at *Renmin* (Peoples) University in Beijing and public health researchers from the National Center for STD Control in Nanjing. In addition, we recruited leading social science and public health scholars and trainees from across China to join multidisciplinary teams and serve on an advisory network.

We concentrated research and training endeavors primarily in Liuzhou City, a location that has been disproportionately affected by the HIV and STI epidemics. Liuzhou is an industrial city in southwest China that serves as a transportation hub and major tourist center located

within the Guangxi Zhuang autonomous region, which borders Vietnam. It is comprised of four urban districts, with a population of 1.4 million people. Combined with six contiguous counties, Liuzhou's total population exceeds 3.8 million. Approximately one-third of residents are migrants from other parts of the province or region, and half are from Zhuang or other ethnic minority groups. Guangxi is one of several Chinese provinces where the HIV epidemic was facilitated by drug trafficking from Southeast Asia during the 1990s. The first case of HIV was identified in Liuzhou in 1996. By 2010, the cumulative number of cases was approximately 10,000, one of the highest rates in China. Liuzhou's city-level CDC officials and health practitioners have an impressive record in public health programs, education, and research on HIV/STI [14], and worked closely with our team on all projects, as documented by authorship on many of the papers in this special issue.

## Our Commissioned Studies

This *AIDS and Behavior* special issue presents the results of our research, based on data from inter-related projects within the umbrella of our training grant. We used a team-based, mixed methods approach to understanding the social contexts of the heterosexual transmission of HIV in Liuzhou. Three large surveys and six qualitative studies demonstrate the contributions of these different data collection and analysis methods. A population-based household survey documents changes in sexual attitudes and behaviors, and attitudes toward people living with HIV (PLHIV); complementary venue-based surveys provide data on patrons and female workers, including a rapid syphilis test as one measure of sexual risk behavior; and a survey of female intravenous drug users (IDU) who trade sex for money investigates environmental and individual-level factors related to risk behaviors in this very marginalized group. Qualitative studies employ interviews, venue mapping, and observations. They feature detailed assessments of the social and sexual contexts of risk for HIV/STI transmission, through venue-based sampling and recruitment of individuals who report on the meaning of particular behaviors or the experience of living with HIV. Our team and our Liuzhou colleagues are experienced in sensitive data collection, and able to contextualize this particular site within the broader changes in sexual behavior and norms occurring throughout the country.

Much has been written about the strengths of interdisciplinary, mixed method health research approaches that draw expertise from a range of disciplines and from collaboration with community partners [15–22]. Indeed, these approaches were essential to the success of our project, which proposed to explore the social contexts of changing individual behaviors. This required quantitative investigations of the general population and selected segments of the population on behaviors of interest, which could then be used to frame smaller-scale, targeted observations and interviews that address the meanings of those behaviors. Taken together, these multi-layered studies help us understand how vulnerabilities are shaped by factors beyond the individual. The papers in this special issue fall naturally into three groups. Below we summarize the themes in each group, and in our concluding essay, provide concrete guideposts for interventions.

## Group 1: Documenting and Understanding Heterosexual Norms and Behaviors

The four articles that fall into this first group set the stage for deeper understanding of the social and sexual contexts of Liuzhou, of risk behaviors that occur in the general population and how they are understood. The section begins with survey data on sexual behaviors in Liuzhou, compared to similar prefectural cities in China [23]. In the second paper, non-commercial “one-time” sex, a behavior documented in the surveys, is explored using the lens of in depth, qualitative interviews [24]. The third paper measures the same behavior through a survey of patrons at Liuzhou entertainment venues, documenting associations with syphilis prevalence [25]. Finally, focus on venue patrons is extended in a different way through interviews with male market vendors, some of whom visit entertainment venues, exploring the meanings of sexual risk behaviors for these men [26]. Thus, in contrast to typical studies of HIV/STI transmission risk, which usually begin with a focus on identified “highest-risk” populations, data in this first group draw a very different kind of portrait, illustrating the broad, social aspects of epidemiological data.

National Chinese data on sexual behavior document increases in multiple partnerships; one-time, non-commercial sexual encounters; and the rising importance of public, social spaces as sites where individuals meet to socialize and find partners [9]. To explore these behaviors in Liuzhou, we conducted a population-based household survey of 852 urban residents, replicating the national Chinese Health and Family Life Survey (CHFLS), which was conducted in 2000, 2006, and 2010 and produced much of the national data on sexual behavior in China. The first paper in this special issue, by sociologist Huang and colleagues, compares data from Liuzhou to 25 similar prefectural cities for individuals age 18–39 [23]. Liuzhou respondents report more socializing, dancing, excessive drinking, sexual activity among never married men and women, purchasing commercial sex among men, engaging in one-time sex among men, and multiple sexual partnerships and self-reported STI among both men and women. Women in Liuzhou describe less sexual risk behavior than men, but greater risk behavior than their national counterparts. This comprehensive overview of the sexual context of Liuzhou provides the context for other studies in this special issue.

Using in depth interviews, the paper by sociologist Zhang Nan and colleagues addresses norms of “one-time” sexual encounters and implications for condom use [24]. Forty-five men and women of all ages in Liuzhou were recruited to talk about their experience of “one night love” (*yiyeqing*), defined as a non-commercial sexual encounter that happens only once. Survey data reported in the first article demonstrate that lifetime *yiyeqing* is more common among men in Liuzhou than in similar cities (19.6 vs. 12.9 %,  $p = 0.01$ ), and the most recent national survey [9] found that half of those who reported ever engaging in *yiyeqing* knew their partners. Zhang’s qualitative data similarly document that most *yiyeqing* partners are not strangers. He shows how these relationships develop in the context of new norms of engagement at entertainment venues where social groups congregate. Interviewees describe how looking for sexual partners in these settings is normal and expected, and often facilitated by the presence of alcohol and drugs. These qualitative interviews also reveal the powerful role of trust in selection of partners and decisions to forego condom use (a theme echoed in the fourth article on male market vendors). High trust in a *yiyeqing* partner often translates into low condom use, whether this trust stems from perceived emotional

connectedness through a prior friendship or social connectedness through introduction by a friend, or friend-of-friend.

The next paper in this group, by epidemiologist Weir and colleagues [25], provides a quantitative backdrop for the *yiyeqing* paper, and additional context for the subsequent paper on male market vendors. The analysis presents findings of non-commercial, one-time sexual encounters and syphilis testing from a 2011 PLACE survey of 797 male and female patrons at randomly selected social venues in urban Liuzhou and three surrounding counties. These data indicate that brief sexual encounters are common, although male–female and city–county differences are striking. Reports of non-commercial, one-time-sex within the past 12 months range from 14.5 % for county women to 24.8 % for urban men. Men reporting noncommercial, one-time-sex were significantly more likely to have a positive rapid syphilis test than other men (7.4 vs. 0.9 %). Among women, a higher proportion reporting commercial sex had a positive test than those reporting non-commercial one-time-sex (6.0 vs. 0.7 %). These data argue for the expansion of existing venue-based HIV/STI prevention efforts beyond those who engage in commercial sex to those who engage in one-time sex.

The last paper in this first group, by sociologist Wang and colleagues [26], explores the question of whether and why migrant male market vendors may be at increased risk for HIV/STI. As noted above, legal migrants comprise at least one-third of the population of Liuzhou. While public health studies have explored risk behavior among migrant construction workers, who are often working far from their homes and families, few if any have addressed the social context of migrant market vendors, many of whom are married with relatively stable employment. After mapping market locations throughout the city, and sub-dividing markets into four types, Wang and his team randomly selected two-to-three markets of each type for recruitment sites. Their data, from in depth interviews with 60 male market vendors, reveal striking differences in sexual risk behavior between wealthier, more socially active shop owners, and those vendors who work in street-side stalls and have little time or money to socialize. The finding that wealthier shop vendors engage in higher-risk behaviors than other migrants echoes patterns from higher socioeconomic strata within Chinese society, as shown by the 2000 CHFLS [27] which documented that wealthy, traveling businessmen were at higher risk of several STI. Both of these studies contradict a common assumption that China's lower social classes are categorically more vulnerable to HIV/STI.

The four articles in this group illustrate the popularity of entertainment venues as meeting places for friends and business acquaintances. Wang's in depth interviews further illustrate how visiting sex workers or hiring escorts is integral to social and economic life among small businessmen in China. These activities are used as a means of establishing and strengthening business relations for market vendors, including aspects of reciprocity, gratitude, and gifting. Wang's study offers detailed portraits of their motivations, and similar to Zhang's *yiyeqing* findings, reveals the importance of social context and trust in going to venues with friends. Data from these studies document an under-appreciation of the risk of non-commercial, multi-partner sex. These results further underscore the complexity of understanding risk in the context of migration, economic position, and social networks. Together with the quantitative and qualitative material on one-time sex, they introduce

themes of the next section, on the roles of venues in increasing risk of HIV/STI, through both non-commercial and commercial sexual encounters.

## Group 2: Social Venues, Social Networks, and Sexual Risk

In 2004, co-investigator Huang published a seminal article on the organization of sex work in China [28] describing the terms and content of sex work that differentiate venues and power relationships between female sex workers (FSW) and managers in terms of higher and lower sexual risk. The four articles in this second group provide quantitative and qualitative data that elaborate upon this work, exploring features of venues and their workers that challenge familiar categories and assumptions regarding risk, and introduce the importance of social networks in understanding how sexual risk is facilitated by social venues. Taken together, the papers problematize the category of FSW, drawing our attention to the social and environmental contexts in which they carry out their work. They show that no matter how venues are categorized, differences in risk and outcomes must be understood in the context of particular environments.

Framing data for this group of papers is provided by epidemiologist Weir's PLACE survey of women working at 42 venues in Liuzhou city and county [29].<sup>1</sup> This first paper in Group 2 sets the stage for questions addressed by the other Group 2 papers about how the people, relationships, and activities within different types of venues result in variations in sexual risk. In this paper, Weir and colleagues use the PLACE survey data to validate a classification of venue types (service vs. entertainment) associated with risk outcomes proposed by co-investigator Chen [30, 31]. Importantly, because all female venue workers were surveyed, a much broader population of women at risk for STI is captured, not only those who self-identify as sex workers. As with the PLACE survey of patrons at Liuzhou venues, a rapid syphilis test was included as a key outcome. The analysis shows that female workers at service venues (defined as lower price, smaller massage parlors, hair salons, and roadside hotels) are five times more likely to have a positive rapid syphilis test than female workers at entertainment venues (defined as larger, more expensive clubs and KTV bars or hotels) (13.1 vs. 2.4 %). Female workers at service venues are also significantly more likely to report risky sexual behaviors, including multiple sexual partnerships in the last year (50.5 vs. 17.3 %) and engaging in sex work (45.1 vs. 13.9 %). In all venues, however, there is documentation of ineffective HIV/STI prevention strategies.

The second article focuses on acquisition of health knowledge and practices, and varying experiences for FSW in different size venues. In this paper, anthropologist Zhang Youcun's qualitative study [32] finds that FSW health practices, information, and HIV knowledge differ significantly in small, medium, and large venues. These FSW navigate risk in all settings, use condoms less with regular partners, and as described in the Group 1 articles, mobilize trust as a strategy for protection. However, in these cases, sex without condoms implicitly symbolizes trust. Documented differences in knowledge and practices suggest prevention interventions should be tailored to maximize effectiveness across different venues.

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<sup>1</sup>The survey was initiated as a methodological comparison of venue-based (PLACE) and respondent-driven sampling approaches, simultaneously surveying FSW in Liuzhou from 2009 to 2010 [40]

The third study explores venues defined by differences in price, and examines how organizational culture evolves differently for minority migrant sex workers in low compared to mid- and high-priced venues. This complementary project was carried out by another anthropologist, Liu Qian, who focused on the experiences of ethnic minority FSW who have migrated to work in Liuzhou [33]. This study included participant-observations and in depth interviews with 33 ethnic minority FSW and six venue managers to describe the experiences of ethnic minority FSW, and the management structures in low compared to mid- and high-priced venues. Liu found that FSW in low-priced venues have more autonomy and stronger relationships with their ethnic minority peers. In contrast, mid- and high-priced venues have more formal management structures, and ethnic minority FSW working in these venues experience less support and sense of kinship with their peers. While HIV/STI prevention outreach activities occur in all of the venues observed, they are not tailored for different venues or types of FSW. Results presented in this paper provide guidance on how public health programs can be designed to meet the needs of ethnic minority women working in different types of sex work venues.

The final paper in this group reports on risk environments for female drug users who also engage in sex work, providing data on the highest risk and hardest-to-reach environments—parks and the street. These locations are not well represented in the venue-based survey, or in the qualitative studies based on venue size and price. Epidemiologist Gu and colleagues [34] investigated the social environmental factors associated with condom use in this marginalized, hard-to-reach group. 200 women were recruited for a cross-sectional survey, with the help of peer workers from two of five syringe exchange programs in Liuzhou. The study produced two major findings. First, female injection drug users who engage in commercial sex are confronted with different types and levels of negative social environments in their daily lives and in sex work. They face limited access to social services, lack social support, and experience stigma and violence from multiple sources. Second, environmental factors (history of violence, clients' willingness to use condoms, and social support) are significantly associated with sexual risk behaviors during commercial sex, including lower condom use. While the sample is not venue-based, this study identifies environmental factors related to risky sexual behavior, and documents that outdoor sex work locations (parks/streets) are associated with the highest sexual risk outcomes.

Studies in this second group advance conceptual frameworks for understanding HIV/STI risk environments. Both Gu and Liu document factors related to low condom use (e.g., trust, social support). Several studies introduce caution regarding language typically used to identify individuals within these environments. For example, in Liu's study, the meaning of "low price" translates into settings in which shared customs, language, and identities make migrant FSW feel safe and maintain trust with peers. In contrast, low income for the male migrant vendors in Wang's study protects against risky sexual behavior, while the social networks so prominent for wealthier vendors clearly promote higher risk. Male and female migrant workers occupy different social locations in these two studies, further complicating the meanings of "migrant". Finally, Gu's results and data from Wang's study also document the importance of drugs and alcohol as factors implicated in sexual risk, and violence emerges most poignantly from Gu's study as a major problem for those most marginalized and vulnerable.

### Group 3: Stigma of Living with HIV

Our third group of papers on the stigma of living with HIV includes quantitative population-level data on attitudes toward HIV, that is, how society views PLHIV, and data from two qualitative studies of the lived experience of HIV that focus on stigma and coping, which provide insight into how PLHIV view themselves. Following Gu's paper in the prior group, these studies document the importance of stigma and the resultant isolation, and through in depth qualitative analysis, they offer insight for where and how to intervene to reduce its impact.

In the first paper, based on the household survey of 852 urban adults in Liuzhou, Abler and colleagues [35] set the stage for the qualitative papers by providing a population based perspective on HIV stigma. They present data on two types of HIV stigma—punishment and isolation. Nearly one-fifth of respondents agree that people with HIV should be punished, implying that they have done something bad to acquire HIV. A much larger proportion of respondents (40 %) believe that people with HIV should be quarantined. Internalization of these societal norms is reflected in the subsequent papers which document feelings held by individuals with HIV that they need to hide, are burdens on their family, and the family itself is stigmatized. In this 2008 survey of a population with one of the highest HIV prevalence rates in China, only 46 % of respondents knew that neither sneezing nor sharing utensils can transmit HIV. Yet, the analysis revealed that having correct knowledge of the modes of HIV transmission mitigates the association with punishment and isolation stigma. While Liuzhou supports programs to provide care and treatment for PLHIV, HIV stigma is surprisingly common. Targeted interventions are needed to focus on alleviating fears related to HIV and PLHIV.

The depth of this need is revealed in the final two papers in this special issue. Hua and colleagues [36] interviewed 23 people living with HIV, 14 public health staff, and 4 community workers. Using the HIV-stigma framework developed by Earnshaw and Chaudoir [37], the interviews are interpreted in terms of enacted, anticipated, and internalized HIV-related stigma. These, in turn, produce negative affective, behavioral, and physical health outcomes, including increased barriers to health care, preemptive self-isolation, suicidal ideation, and poverty. These descriptions of individual experiences for PLHIV in Liuzhou provide compelling data for programs that should focus on increasing HIV knowledge and empathy for PLHIV among family members, community workers, and health professionals, and in particular, for programs that include suicide risk reduction efforts.

In a companion article, Zhang Yingxia and colleagues [38] focus on stigma-related coping strategies among people with sexually acquired and drug transmitted HIV. Through in depth interviews this research, like that of Hua and colleagues, documents severe stigma, very low self-esteem, and common feelings of despair among 47 PLHIV in Liuzhou. A typology of passive and active coping strategies used by PLHIV to deal with HIV-associated stigma is presented. These strategies exist at inter- and intra-personal levels, and while isolation and self-care are common coping responses, the article documents more positive, self-affirming approaches that might be incorporated into intervention programs.



## Conclusion

The papers in this special issue help us to better understand heterosexual behaviors and their meanings for populations at risk, and how social contexts have shaped these behaviors and meanings. The emphasis on social context underlies the “Partnership for Social Science Research” approach that motivated our R24 grant projects, but the papers also delve deeper into the experiences and behaviors of women and men in social venues, to understand more about the networks of people within the venues, how they relate to one another, share information, and influence each other. From the perspective of methods, this research sets an example for how quantitative and qualitative data collection and analyses can work together to inform a study or understand its results. These approaches not only help us understand how HIV/STI are associated with certain social contexts and what social factors contributes to heterosexual transmission, but importantly, also inform more effective intervention activities [39], as will be discussed in the concluding paper.

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