Temporary Migration and STD/HIV Risky Sexual Behavior: A Population-Based Analysis of Gender Differences in China

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Abstract

The link between migration and STD/HIV risky sexual behavior has been well documented. Research of risky sexual behavior that addresses the issue of gender-migration interaction or employs a multilevel perspective is still limited in China. Using data from a probability survey and applying multilevel modeling, this paper examines gender differences in (1) the link between migration and risky sexual behavior and (2) individual and community correlates of risky sexual behavior. Results suggest significant interaction between gender and migration. Being temporary migrant is associated with significantly more risky sexual behaviors for females but significantly fewer for males. There are also significant interactions between gender and marriage and living arrangement. Being married and living with others both appear to be more powerful deterrents to risky sexual behaviors for females than for males. Single migrant women who live alone would have the most risky sexual behaviors while married non-migrant women who live with others would have the least. Risky sexual behavior is further influenced by family and peers and conditioned by community contexts. Prevention programs are urgently needed for female temporary migrants and must address the issue of gender and pay attention to social influences of family/peers and community contexts.

Introduction

Amid the miracles of economic growth, China has since the early 1980s witnessed an epidemic growth in STDs and widespread commercial sex (Pan et al, 2004; Parish et al, 2003; van den Hoek et al, 2001). The growth of commercial sex in China and the increasing unprotected casual sex among its 1.3 billion population will likely continue to fuel the epidemic growth of STDs unless effective measures are taken to reduce STD risky sexual behaviors. In 2005 alone, 703,001 cases of STDs were officially reported nationwide with the actual number perhaps many times larger (China CDC 2006). If left unchecked, the continuing spread of STDs, including HIV, will create a serious public health challenge, threatening the national security, social stability, and economic development (China MOH and UNAIDS 2003). While causes of commercial sex and spread of STDs are likely to be complex and multifaceted, increasing temporary migration has been portrayed by the media and implicated in the literature as one of the main catalysts.

The growth of temporary migrant population in China since the early 1980s has been truly phenomenal. Although varied by sources, the total number of temporary migrants was estimated to have grown from 11 million in 1982 to 79 million in 2000 (Liang and Ma 2004). Among the tidal waves of rural-urban temporary migrants are hundreds of thousands of young women from poor rural villages (Fan 2003; Gaetano and Jacka 2004; Roberts 2002). Living and working away from home and/or regular sexual partner, the uprooting and movement of so many migrant men and women in their primary, sexually active ages, may create conditions that are conducive to casual and commercial sex. In fact, residential immobility is considered the most important factor that explains the absence of commercial sex in pre-reform China (Troyer, Clark, and Rojek 1989).

While the link between migration and STD/HIV risky sexual behavior has been well documented, less understood is the question of whether the migration and risky sexual behavior link is the same for men and women (Yang and Xia 2006). Is there any interaction between migration and gender in influencing STD/HIV risky sexual behavior? Are migrant men or women more vulnerable to risky sexual behavior? Are there any significant differences in gender-specific correlates of risky sexual behavior?

Answers to these questions will have important public health implications, as women in China are almost as active as men in migration (Fan 2000; Liang and Ma 2004) and their share in reported STDs has been on the rise in recent years (China CDC 2006). Women have also become the fastest growing population newly infected with HIV in China (China MOH and UNAIDS 2003).

This paper tries to answer these questions through a population-based analysis of gender differences in (1) migration and risky sexual behavior link and (2) individual and community level correlates of STD/HIV risky sexual behavior. The analysis will help to shed light on the interplay between migration and gender in understanding risky sexual behavior and also provide important empirical data for the design of gender-specific STD/HIV prevention intervention programs.

Background

For almost three decades leading to the 1980s, the Chinese government had maintained tight control over changes in residence through household registration (Chan and Zhang 1999; Wang, 2004; Yang 1993). Under the system, people who did not have a local household registration would not be able to find a job, buy food and other necessities, or have access to social services. With no market alternatives in pre-reform China, it was almost impossible for migrants to survive economically and socially in places of destination if their relocations were not officially approved. Consequently, despite huge differences in standards of living across locations, particularly between rural and urban places, migration was effectively blocked by local governments through limiting the circumstances under which a change in household (residence) registration could be granted. The resultant residential stability had led to extremely stable communities where "everyone knows everyone" and "strangers were easily identified and placed under supervision" (Situ and Liu 1996:294), which in turn had helped to maintain social order and explain the largely absence of extra marital and commercial sex in pre-reform China (Troyer, Clark, and Rojek 1989).

However, the profound structural changes since the early 1980s have greatly undermined the effectiveness of the household registration system in regulating residential mobility and maintaining social order. In urban areas, the more relaxed employment policies and the legalization of private

businesses have resulted in an increasingly differentiated employment structure, which places more and more labor force outside the control of government (Wilson 1990). The result is a dualistic division of jobs between state or large collective enterprises and small collective units and the private forms of labor activities (Fan 2002). With few exceptions, jobs in the latter are often rejected by urban youths because they offer no job security, few benefits, and little social prestige. Concurrently, reforms in rural areas have dismantled the collective control of agricultural production. Land is allocated and cultivated by individual households, and non-agricultural activities are promoted. The more efficient household-based production has resulted in hundreds of millions of rural surplus labor (Roberts, 1997; Taylor 1988).

A combination of the lack of urban residents willing to work in some sectors and the readily available migrants happy to fill the vacancies has forced firms to turn to migrants for their labor needs (Solinger 1999). In addition, a pent-up demand for services of all kinds in cities has led to vast self-employments. It is not a coincidence that the hiring of workers based on qualifications rather than having a local residence registration has been sanctioned through a series of government regulations. Similar policies have been implemented to allow peasants to enter commercial channels and to work in urban places through self-employment. Further, the government started relaxing control over urban residence in the mid-1980s, allowing rural peasants to live in cities as temporary residents, provided they meet their own employment, housing, and service needs (Wang 2004). The burgeoning urban free markets, together with reforms in education and social services, have enabled people to buy all daily consumer goods and to obtain education and most social services. These simultaneous developments have provided timely market alternatives to government provision of employment and services, thereby allowing migrants to live outside the government allocation (ration) system (Yang 1993).

For the first time in decades, both legal and market barriers to living in cities without a local registration have been considerably reduced. Rural-urban temporary migration, which involves no change in official permanent residence registration, has increased rapidly throughout China, becoming part of rural households' strategy in reallocating labor through wage labor (Roberts 1997). The increasing temporary migration in turn has left its impact in every aspect of socioeconomic lives in contemporary

China. In particular, the role of temporary migration in the spread of STD/HIV risky sexual behavior and the potential gender-migration interaction that may render female migrants more vulnerable to risky sexual behaviors have recently attracted attention from both scholars and policy makers in China and abroad (Yang, 2006; Yang and Xia 2006).

Migration, Gender, and Sexual Behavior

A number of studies in China (Anderson et al, 2003; Li et al, 2004; Smith and Yang 2005) and elsewhere (Skeldon 2000; UNAIDS 2001; Wolffers et al, 2002) have highlighted the vulnerability of migrants to STD/HIV risky sexual behaviors. The usual separation from spouse or regular sexual partner due to migration can disrupt migrants' regular sexual relationships, which is presumably conducive to casual sex and/or dependence on alcohol as a way to escape loneliness, bury anxieties, and release sexual frustration (Brockerhoff and Biddlecom 1999; Jochelson, Mothibeli, and Leger 1991). Being away from home probably also means breakaway from family supervision, which may lead to venture into risky sexual behavior. This may be particularly so for women as families in China, powered by deeply rooted Confucian concepts about women and widespread double standards of sexual behavior for men and women, arguably exercise more control and scrutiny over female than male members' sexual behavior (Yan 2003).

Temporary migrants' post-migration social and economic milieus may also be more conducive to risky sexual behavior. Although not all are alike, many rural-urban temporary migrants in China may be socially, culturally, and residentially isolated from the "mainstream" society in the city. Most are concentrated in the margins of the urban economy, engaged in dirty, dangerous, and dead-end jobs (Knight, Song, and Jia 1999; Solinger 1999; Wang, Zuo, and Ruan 2002), and live with fellow villagers at the work place or in migrant communities, often characterized by overcrowding, social disintegration, and lack of social and health services (Ma and Xiang 1998; Zhang 2001). As a result, many rural-urban temporary migrants in China may experience little social or cultural assimilation in cities, feel helpless, insecure, discontented, and resentful, and be prone to risky sexual behavior (Anderson et al, 2003).

Further, the process of temporary migration is believed to weaken social and normative control

over individual behavior by detaching migrants from the family and home communities (Yang 2000). Such detachment often results from the physical separation of temporary migrants' working and living place (the place of urban destination) from their family and home community in the place of rural origin. It may create some sort of social control vacuum whereby migrants feel less constrained by social norms and values since families and friends back home are unlikely to find out what they do while away (Maticha-Tyndale et al, 1997; Yang 2000). The power of sanction embedded in social and normative control over individual behavior may be lost in the process. The more anonymous life in a city and easier access to commercial sex together may help temporary migrants to break away from social norms about sex and sexual fidelity and encourage them to seek casual sex.

Thus, the combination of economic marginalization, social isolation, and lax social/normative control may render temporary migrants more vulnerable to STD/HIV risky sexual behavior (Yang, Derlega, and Luo 2007). However, temporary migration in China is increasingly recognized as a gendered process (Davin 1999; Fan 2000; Gaetano and Jacka 2004), suggesting that female temporary migrants may experience differently than male migrants in sexual behavior and that the association between temporary migration and risky sexual behavior may differ between men and women. Studies of migration-sexual behavior link need to pay attention to issues of gender and gender-migration interaction that could potentially render female migrants more vulnerable to risky sexual behavior.

Indeed, gender-related unequal relationship power and cultural norms about gender and sexuality have been increasingly recognized as important determinants of risky sexual behavior among women (Browning et al, 1999; Tang, Wong, and Lee 2001). According to the theory of gender and power (Connell 1987; Wingood and DiClemente 2002), women's heightened vulnerability to risky sexual behavior is a function of gendered relationships between men and women that are rooted in the sexual divisions of labor and power and the gendered structure of social norms. The sexual division of labor limits women's equal access to the paid labor market and creates economic inequalities between men and women. This can reinforce women's economic dependence on men and increase women's economic exposure to STD/HIV risky sexual behavior. The sexual division of power leads to unequal power

between men and women that results in men's control in relationships and renders women vulnerable to sexual or physical abuse. This can limit women's ability to make decisions on sexual matters and increase their physical exposure to risky sexual behavior. The gendered structure of social norms generates gender-specific norms that restrict women's sexual expressions and submit women to men in sexual relationships. This can discourage open discussion within relationships and limit women's access to information, thereby increasing women's social exposure to risky sexual behavior.

Together, economic inequalities, unequal relationship power, and gendered cultural norms exert critical influences over women's sexual behavior and render formidable barriers to women in exercising personal control in sexual and social relationships (Amaro and Raj 2000). Research among Chinese women (Tang, Wong, and Lee 2001) suggests that the Confucian concept of model womanhood, which commands the submission of women to men, can significantly constrain women's ability to insist on condom use. In general, non-condom use among Chinese women is found to be related to lack of information, embarrassment in talking about condoms, and fear of being perceived as sexually available. Studies of women working in China's flourishing entertainment industry (Liao, Schensul, and Wolffers 2003; Xia and Yang 2005), who are mainly temporary migrants from poor rural villages, have underscored the importance of economic survival, relationship power, and cultural norms in understanding unprotected commercial sex.

Rural-urban migration may affect migrant women's economic, physical, and social exposures to risky sexual behavior, although the direction of the impact is often elusive. On the one hand, rural-urban migration is seen to allow women to break away from traditional roles and gendered social controls and help them to gain economic independence, thereby reducing their economic exposure to risky sexual behavior. The urban experience can empower migrant women, which, together with greater gender equality in relationship power and behavioral norms in urban than rural areas, may help them to gain control in matters related to reproductive health, including sexual behavior (Dodoo and Tempenis 2002). This means that migration may change female migrants' views about gender roles and sexuality, give them greater freedom and decision making power in sexual relationships, and reduce both their physical

and social exposures to risky sexual behavior.

On the other hand, migration may not be so positive for women. Due to gender inequalities in education and job training, female migrants are more disadvantaged in cities and usually do not do as well as their male counterparts (Huang 2001; Liang and Chen 2004). The market transition has even weakened the institutional support for gender equality and increased gender segregation in the urban labor market. The resurfacing of negative stereotyping of women has further fueled discrimination against female temporary migrants (Fan 2003). Compared to their male counterparts, female migrants are found to have greater difficulties entering mainstream occupations and are channeled mainly into low status jobs, perpetuating women's inferior and subordinate status (Fan 2000, 2003). Heavily concentrated in labor-intensive assembly and service industries (Roberts 2002), female temporary migrants may be economically more marginalized and socially more isolated. Economic marginalization and social isolation, together with separation from family and social supporting network, can reinforce traditional gender-role behaviors among migrant women as a coping and survival strategy. As such, migration may not be such a liberating experience for women and may actually reinforce gender inequalities and lower relationship control and negotiation power in sexual relationships, rendering female migrants vulnerable to sexual exploitation and risky sexual behavior (Bandyopadhyay and Thomas 2002; Parrado, Flippen, and McQuiston 2005).

In addition, female temporary migrants may experience more of weakening social and normative control in sexual behavior. For example, rural-urban migration may help female migrants to break away from family or spousal supervision, which due to gendered role expectations and gender inequality in relationship power could be extremely oppressive and prohibitive, to gain greater independence and behavioral freedom. Separation from family may thus carry greater sexual freedom for females than males, who may already enjoy more freedom at home. However, the greater sexual freedom that female migrants can enjoy may not necessarily translate into greater relationship power and personal control in sexual encounters. On the contrary, the greater economic marginalization and social isolation experienced by female temporary migrants, together with the demand for sexual services in the city and the lure of

quick money of commercial sex, may force some female temporary migrants to exchange sex for money or to enter into casual sexual relationships in hope of securing economic and emotional support. Economic hardship and dependence on partner in turn can reduce female migrants' personal control and negotiation power in sexual relationships, render them vulnerable to sexual violence by abusive partners, and increase their risky sexual behavior (Liao, Schensul, and Wolffers 2003; Xia and Yang 2005).

Whether positive or negative, it appears that migration may potentially affect women differently than men and that risky sexual behavior among women may result from factors beyond their control and be influenced by gender-related inequalities and relationship power. Studies of the association between migration and risky sexual behavior would be incomplete without addressing issues of gender and gender-migration interaction and paying attention to social influences of individual sexual behavior.

Social Influences and STD/HIV Risky Sexual Behavior

For both men and women, research increasingly indicates the importance of social influences on individual behavior (Edwards et al, 1990; Svenson et al, 2002). Human behaviors, including STD/HIV risky sexual behavior, are not inborn but learned through socialization. Many factors determine the course of socialization, but family perhaps has the most influence because parents are not only the major source of behavioral reinforcement, but also models for imitation that can last for a lifetime (Bandura 1986; Troyer, Clark, and Rojek 1989). Children grown up in a family with members who have risky sexual behavior may develop similar behavior through imitation and modeling. The presence of family members with risky sexual behavior may create a family environment in which such behavior is more tolerated. Similarly, peers may influence each other's behavior through a variety of mechanisms including persuasion, social comparison, social sanctions, information exchange, modeling and reinforcement of behavior, and social interactions (Fisher 1988; Hall and Wellman 1985).

Like social network of family and peers, the larger community where one lives and works can influence individual sexual behavior. A growing body of research has called for attention to contextual and situational factors in understanding STD/HIV risky sexual behavior (Kerrigan et al, 2003; Wang and Gao 2000; Yang 2005) and the need to study individual sexual behavior from a multilevel approach

(Entwisle and Mason 1985). In particular, social norms are found to play an important role in sexual behaviors (Frye et al, 2006; Latkin et al, 2003; Richard, Bell, and Montoya 2000). Indeed, the breakdown in traditional norms about sexual behavior amid development and market transition in China is arguably one of the main contributing factors in the spread of commercial sex and other risky sexual behaviors throughout the country (Hyde 2000; Farrer 2002).

In addition, a number of recent studies have underscored the potential impact of urban residence on sexual behaviors (Frye et al, 2006; Vlahov and Galea 2002). The physical environment of urban living is arguably more stressful, which may increase mental health problems (Marsella 1998; Paykel et al, 2000) and in turn risky sexual behaviors. Socioeconomic inequalities, which are more pronounced in urban than in rural areas, may be associated with increased psychosocial stresses, leading to greater interpersonal tension and increases in risky sexual behaviors as coping and stress reduction mechanisms (Frye et al, 2006; Galea, Rudenstine, and Vlahov 2005). The social and normative environments in urban areas meanwhile are also found to be more conducive to risky sexual behaviors because of greater anonymity, more liberal behavioral norms, and increased diversities in population and social networks in urban than rural areas (Weiss and McMichael 2004). The more tolerable normative environment and easier access to commercial sex, reinforced by the presence of people with different sexual behaviors who set real life examples for others to follow, may facilitate the spread of risky sexual behavior in urban environments. On a positive note, usually greater gender equality in urban areas may provide the social environment that empowers women and increases their decision power and personal control in sexual relationship and reproductive health (Dodoo and Tempenis 2002).

Despite the potentially gendered relationship between migration and risky sexual behavior and the importance of social influences of family/peers and community contexts, research on migration and STD/HIV risky sexual behavior in China has only recently started to pay attention to issues of gender-migration interaction (Yang 2006; Yang and Xia 2006). Still, few studies in China have tried to incorporate attention to influences of family/peers and environmental contexts and to understand risky sexual behavior from a multilevel perspective. The lack of attention to the interplay between migration,

gender, and risky sexual behavior is particularly striking as women are as actively as men participating in rural-urban migration and as rural-urban migration in China is increasingly recognized as a gendered process (Davin 1999; Fan 2000; Gaetano and Jacka 2004).

We hypothesize that there is significant gender and migration interaction, leading to a stronger association between temporary migration and risky sexual behavior among females than males, and that risky sexual behavior is influenced by both individual and contextual factors. Despite migration's potential positive impact on female migrants, social, cultural, and structural constraints may have limited their positive experiences (Fan 2004; Murphy 2004) and actually exposed them to social and economic environments that may be more conducive to risky sexual behavior.

Needless to say, not all female temporary migrants are alike, nor are all female non-migrants sexually traditional and conservative. Changes in social norms about marriage and sexual relationships amid market transition in China could have affected the sexual behavior of both men and women and of both migrants and non-migrants (Farrer 2002; Pan 2004; Yan 2003; Zhang et al, 1999). Nonetheless, we argue that female temporary migrants in China may be subject to the double jeopardy of temporary migration and gender. Consequently female temporary migrants may be sexually riskier than both male temporary migrants and female non-migrants, and correlates of risky sexual behavior may vary between men and women and include both individual and contextual factors.

Data

Data used in the analysis are from a large sample survey conducted in 2003, covering an entire province in southwestern China. Although by no means perfect, the province represents the more traditional and rural economies with limited outside exposure that characterize the western half of China, where level of development and standard of living are way behind the coastal provinces. With its multi-ethnic populations and geographic proximity to drug production and distribution centers in Myanmar, the province has been an important "port of entry" for and a distribution center of illicit drugs in China. It is also where the earliest HIV epidemics among drug using populations are reported and currently home to the largest number of people living with HIV/AIDS in China.

Like the rest of China, recent structural changes and market transition have greatly facilitated rural-urban temporary migration. In fact, the province has experienced one of the largest increases in temporary migrant population in recent years. With a growth rate of 230% between 1990 and 2000, it was the only province away from the east coast that had more than doubled its temporary migrant population during the period (Liang and Ma 2004). Besides the structural changes, tourism has been the other driving force in the rapid growth of temporary migrant population in the province, which has become one of the most attractive destinations for both domestic and international tourists. Tourism, interacting with market and social changes, may have fueled the growth and spread of commercial sex in the province (Hyde 2000).

Sample selection of the survey followed a three-stage procedure. First, tabulations of known HIV/AIDS cases, drug users, and temporary migrants by counties/cities were prepared with data from the provincial public health and public security agencies and the 1995 mini-census. These tabulations were used to rank all counties/cities, and from the ranked list, four counties and four cities were selected, giving priority to counties/cities with higher concentration of HIV, drug use, and temporary migrant population. Second, all rural townships and urban neighborhoods in the selected counties/cities were ranked by county/city according to estimates of HIV cases, drug users, and temporary migrants, using existing data from the same government agencies and the 1995 mini-census. From the ranked lists, five rural townships and/or urban neighborhoods were selected from each county/city. Again, the selection was not random but gave priority to places with a combination of high prevalence of HIV, drug users, and temporary migrants. This resulted in a total of 40 townships and neighborhoods as the primary sampling units (PSUs).

Table 1 provides a comparison between the 40 PSUs included in the survey and the province as a whole in selected background indicators. As would be expected based on the sampling design, the 40 PSUs had on average higher prevalence of HIV, drug use, and temporary migrants than the provincial average. In addition, the 40 PSUs were on average larger in population size and had higher prevalence of crimes, commercial sex, and STDs, and also more entertainment establishments. Except for GDP per

capita, all other aggregate socioeconomic indicators indicated that the 40 PSUs were on average more developed than the rest of the province. The higher GDP per capita for the province as a whole was probably due to the exclusion from the sample of the provincial capital, which was the non-rivaled center and forerunner of development and which predominated the non-agricultural economy in the province. The same reason may explain the lower proportion of female temporary migrants in the sampled 40 PSUs.

(Table 1 about here)

On average, the survey/study was not fully representative of the province; it represented the more developed areas with more development-related social problems, such as crimes, drugs, commercial sex, and HIV and STD epidemics, but not the most developed large cities in the province. However, none of the 40 PSUs was known to be "red-light" districts or zones.

In the final stage of the sample selection, all individuals 18 to 55 years of age were arrayed in sequence by PSU in one of four categories: persons with HIV/AIDS, drug users, temporary migrants, and non-migrants. The decision to classify the population into the four categories in the sampling was mainly to secure enough "rare" populations of person with HIV/AIDS, drug user, and temporary migrant in the sample. Permanent migrants, whose migration was officially approved and who had consequently had their permanent household registration transferred to places of destination (interview), were included in the non-migrant category for sampling. The reason not listing permanent migrants in a separate category for sampling was because the original study was focused on the link between temporary migration and the spread of drugs and HIV.

Information used to assign individuals to a sampling category was based on household registration rosters (non-migrants) and confidential registrations of temporary migrants, drug users, and persons with HIV/AIDS. They were crosschecked for multiple listings. If an individual appeared on more than one category, he/she was reassigned to only one category according to the following priority order: person with HIV/AIDS, drug user, temporary migrant, and non-migrant. For example, a temporary migrant who was also a drug user and HIV positive, that individual was retained in the list of persons with HIV/AIDS and removed from the lists of temporary migrants and drug users. Therefore, all

individuals would appear in one and only one of the four sampling lists/categories, which were mutually exclusive. Again, the priority order was set to make sure that the more rare populations had a higher priority to be sampled.

In selecting individuals, disproportionate probability sampling (Bilsborrow et al, 1997) was used to make sure that the resulting sample would contain sufficient numbers of rare populations, e.g., persons with HIV/AIDS and drug users, but not overwhelmed by non-migrants. A target random sample of 150 individuals from each PSU was planned and distributed as follows: 20 persons with HIV/AIDS, 30 drug users, 40 temporary migrants, and 60 non-migrants. In each sampling category, sample selection started with randomly picking a person from the list and continued selecting at fixed intervals determined by the ratio between the total on the list and the target number for the category. If a list contained fewer than the target number, everyone on the list was selected. Because not every PSU had the target number of subjects in all categories, the actual sample size in a category varied across PSUs.

During the fieldwork, trained interviewers visited the sampled individuals, explained to them the purpose of the study, their right to refuse, and compensation for their time, and invited them to participate. If the respondent was absent, a second visit was scheduled. If a respondent could not be reached the second time or refused to participate, a replacement was selected randomly from the original sampling list containing the absent or refused respondent unless there was no one left on the list. Participant refusal was low (3.4 per cent), except for persons with HIV/AIDS, of whom almost 29 per cent refused to participate. Of the original sample of 5,570, 5,382 consented to participate and completed a face-to-face interview, which took place in private at respondents' home or if they preferred a place away from home. Of the total, 4,694 were sexually active and included in the analysis. Table 2 provides a breakdown of the original sample and the sub-sample used in the analysis by sampling categories or actual status. Interviewers and respondents were not matched for sex for all interviews; all interviews were conducted in Mandarin or the respondent's dialect if the respondent could not communicate in Mandarin.

(Table 2 about here)

While the selection of study participants was random and probability based, the use of various

government registrations, which were the only possible sampling frameworks available at the time, in sampling individuals could introduce biases. Given the social stigma or even legal implications of HIV, drug abuse, and to a lesser extent being temporary migrant, some persons with HIV/AIDS, drug users, and temporary migrants might not have registered and consequently were hidden from the government registrations. Some of those hidden populations would have been included in the non-migrant category, which had a larger planned sample size, and revealed their respective status in the survey questionnaire (another reason why the numbers of respondents in each actual HIV, drug user, temporary migrant, and non-migrant status differ from those according to the original sampling categories, Table 2). But the sample was unlikely completely representative of the entire HIV positive, drug using, and temporary migrant populations. The sample of persons with HIV/AIDS might have been further biased due to their much higher refusal rate.

Methods and Measures

Version 9 of the STATA software is used to conduct statistical analyses, which are divided into two parts. The first part of the analysis focuses on bivariate comparisons between temporary migrants and non-migrants by gender. Pearson's Chi-squared tests of difference in proportions, further corrected for survey design and converted into *F* statistics in STATA's "svy" cross-tabulation analysis, are used to test if temporary migrants differ from non-migrants in eight risky sexual behaviors and if migrant and non-migrant differences vary by gender. Temporary migrants are defined as respondents who were working and living in the place of interview but without the official local household registration (*hukou*) at the time of interview. The eight risky sexual behavior measures are all dichotomous, indicating whether the respondent had casual sex, unprotected casual sex, commercial sex, more than one casual sexual partner, more than one casual sexual act, any episode of drinking while having sex, any episode of taking drugs while having sex, and known IDU sexual partner in the 30 days prior to the survey.

In the second part of the analysis, the eight dichotomous risky sexual behaviors are first combined to form a composite risky sexual behavior index, which may be a more accurate measure than any single dichotomous measure (Williams et al, 2001). The index is constructed by first obtaining the mean of non-

missing responses across the eight dichotomous (0 and 1) sexual behaviors with equal weight using the "alpha" method in STATA and then multiplying the mean by eight. So any missing response on a particular risky sexual behavior for a respondent is actually replaced by his/her mean non-missing response in creating the composite index. The higher the index value, the more the risky sexual behaviors. Cronbach's alpha for the composite index with the survey data is 0.80.

Multiple linear regression with the composite risky sexual behavior index as the dependent variable is then used to examine the impact of temporary migration and gender on risky sexual behavior. Given the multilevel causes of risky sexual behavior and our desire to model simultaneously its individual and PSU-level correlates, the "xtreg" multilevel modeling in STATA is used for all multiple linear regressions. The multilevel modeling takes into consideration of potential correlations among study participants from the same PSU as well as differences in unspecified factors across PSUs (Guo and Zhao 2000; Hox and Kreft 1994). All multilevel analyses further control for differences in selected individual and PSU characteristics. Specifically, age, HIV+/drug user, education, marital status, residence, social influence of family and peers, measures of economic marginalization, social isolation, and lax social control, and PSU-level divorce ratio and number of entertainment establishment are controlled in the multilevel analysis.

Age, measured as a continuous variable, can potentially affect risky sexual behavior partly because young adults usually have more liberal attitudes toward sex and sexuality (Zhang et al, 1999; Yan 2003). HIV+/drug user is a dichotomous variable, taking the value of 1 if the respondent is HIV positive or a drug user and 0 otherwise. Being HIV positive or a drug user may be associated with increased risky sexual behavior. Marital status, also a dichotomous variable coded 1 for married and 0 otherwise, is potentially a key variable in understanding risky sexual behavior. Being married may be less likely to engage in risky sexual behaviors because of social norms about marital fidelity, spousal control, and the regular sexual relationship. The deterrence of marriage to risky sexual behavior may be greater for females than males because of the usually greater spousal control by husbands than by wives and double standards between men and women concerning marital fidelity and sexual behavior. Educational

attainment is classified into four categories: illiterate, elementary school, junior high school, and senior high school or more education. Education has potentially different effects on risky sexual behavior. While more education may lead to more liberal attitudes toward sex, people with more education may be more knowledgeable about and concerned with both medical and social consequences of risky sexual behavior.

Economic marginalization is indicated by 1) unemployment, 2) employment in service and entertainment industries, and 3) employment in unspecified sectors. Economic marginalization can potentially affect risky sexual behavior because it is often associated with increased psychosocial stresses, which lead to greater interpersonal tension and violence and in turn increase in risky sexual behavior as a coping and stress reduction mechanism (Frye et al, 2006; Galea, Rudenstine, and Vlahov 2005). Previous descriptive studies (Xia and Yang 2005; Yang 2006; Yang and Xia 2006) in China have highlighted the vulnerability of employment in service and entertainment industries to risky sex among female temporary migrants. We suspect that the unspecified employment sectors include mainly informal economic activities. Like unemployment, informal economic activities may share similar features/conditions as that in the service and entertainment industries, which are found to be more conducive to risky sexual behavior (Wang and Gao 2000).

Social influences of family and peers on risky sexual behavior are measured by two dichotomous variables. The first indicates the influence of family and is coded 1 if respondents self-reported knowing any of their parents, siblings, and close relatives having multiple sexual partners, homosexual behavior, or exchanged sex for money or drugs, and 0 otherwise. The second indicates the influence of peers and is coded 1 if respondents self-reported knowing any close friends or peers having any of the three risky sexual behaviors and 0 if none. Having family members or peers with risky sexual behaviors is expected to increase respondents' own risky sexual behavior.

All the other individual-level control variables are composite scales or indexes constructed from multiple questionnaire statements in the same way as the risky sexual behavior index (the dependent variable) is constructed. Social isolation is measured by a modified version of the UCLA Loneliness Scale (Russell 1996) and the Center for Epidemiologic Studies Depression Scale (Radloff 1977). For the former,

respondents reported on a four-point scale how lonely they felt on each of 20 statements, while the latter was based on ratings of 20 statements on a four-point scale on the frequency of depressive symptoms experienced in the week prior to the interview. Answers to the 20 statements of the two scales are summed to form the "loneliness" and the "depression" scales, respectively. The higher the scales, the more lonely or depressed the respondent felt. Cronbach's alphas for the two scales are 0.80 and 0.84.

Being cut off from the mainstream society, social isolation can deprive people of exposure to role models for social behavior and of access to opportunities (Wilson 1987). If people feel that they are blocked off from the access to opportunities through diligent effort and orderly behavior, they are unlikely to conform to behavioral norms and values, leading to socially deviant and epidemiologically risky behavior as an effort to release the frustration and anxieties associated with social isolation (Whyte and Parish 1984). Social isolation is found to be associated with a number of health behaviors and carry a significant health risk (Lauder et al, 2006). Social isolation can also increase psychosocial stresses and feelings of helpless, insecure, and resentful, and in turn risky sexual behavior as a coping mechanism (Frye et al, 2006; Galea, Rudenstine, and Vlahov 2005).

Lax social and normative control is measured by two variables. The first is a modified version of the Attitudes toward Authority Scale (Emler 1999). Respondents reported yes or no on their personal experience with respect to nine events indicating disrespect for laws or use of "deviant" ways to achieve personal ends. Answers are summed to create the lax social control scale (Cronbach's alpha=0.71). The higher the scale, the more the respondent had behaved in disrespect for laws or social norms (resulting from lax social and normative control). The second is a dichotomous variable, which takes the value of 1 if respondents were living alone by themselves at the time of interview and 0 if they were living with family or others. Living alone may be associated with lax social control. The importance of social control is that fears for social sanctions from violating social norms about sexuality and marriage may deter individuals from risky sexual behavior. However, once anonymity prevails, and people feel safe from being detected, adherence to social norms may decrease, leading to increases in socially proscribed and STD/HIV risky sexual behavior (Whyte and Parish 1984).

Finally, social influences of community (PSU) context are measured by urban residence, divorce ratio, and number of entertainment establishment. Urban residence, which is included as a dichotomous variable and coded 1 for urban and 0 for rural residence, is potentially an important contextual factor in understanding risky sexual behavior. Urban residence may be conducive to risky sexual behavior partly because it is usually associated with greater anonymity, more liberal sexual norms, and increased diversities in population and social networks (Frye et al, 2006; Weiss and McMichael 2004).

The other two community-level variables are both based on secondary PSU aggregate statistics and measured by the five-year means of the respective annual statistics (1996-2000) from the PSU questionnaire of the survey. The first is the mean divorce ratio, which is defined as the ratio between the number of divorces and the number of currently married in the PSU. The other is the mean number of registered entertainment establishment in the PSU. A higher divorce ratio in the PSU may indicate a more tolerable normative environment about sex, love, and marriage, presumably conducive to the spread of risky sexual behavior. More entertainment establishments, where commercial sex is widely suspected (Farrer 2002), in the PSU may be associated with greater exposure to sex-related cultural, social, and physical scenes and access to casual and commercial sex, thereby increasing risky sexual behaviors in the PSU.

Results

Overall, temporary migrants were younger and less likely to be married (Table 3); the migrant and non-migrant differences were more pronounced among females than males. Although female temporary migrants had a slightly higher percentage of persons with HIV/AIDS or drug users than non-migrants, the difference was not statistically significant. By contrast, male temporary migrants were three times as likely as non-migrants to be in the HIV+/drug user group.

In terms of education, temporary migrants were more likely than non-migrants to be in the middle (elementary and junior high school education) of the educational distribution. Female temporary migrants were particularly overrepresented in the elementary school but underrepresented in the senior high school or more education categories. Of the four migrant-by-gender groups, female temporary migrants were the

least educated with more than half of them (54.4 per cent) receiving no more than an elementary school education.

(Table 3 about here)

Female temporary migrants were also the most disadvantaged in terms of economic marginalization indicators. First, female temporary migrants had an unemployment rate that almost doubled that of female non-migrants and was almost three times or more that of male non-migrants and migrants. Male temporary migrants, however, did not seem to experience much disadvantage in overall employment. In fact, male temporary migrants had the lowest unemployment rate among the four groups. Second, female temporary migrants were overwhelmingly concentrated in the service and entertainment sectors. While females were generally more likely than males to be employed in service/entertainment sectors, the female-male difference was more pronounced among temporary migrants (46.1 vs. 10.9 per cent) than non-migrants (4.5 vs. 1.9 per cent). Even though male temporary migrants were also more likely than male non-migrants to be in service/entertainment sectors, the difference was relatively smaller (10.9 vs. 1.9 per cent) than that characterized females (46.1 vs. 4.5 per cent). The results appear to suggest the presence of gender-migration interaction in migrants' employment experience.

Gender-migration interaction seemed to also play a role in accounting for migrant and non-migrant differences in psychosocial wellbeing. On both scales, female temporary migrants scored highest and experienced significantly more symptoms of depression (37.6 vs. 33.2) and felt lonelier (41.7 vs. 36.9) than their non-migrant counterparts. By contrast, male temporary migrants did not differ from non-migrants in experiences of depressive symptoms. Further, while female temporary migrants scored considerably higher than male temporary migrants, there was very little gender difference in either scale among non-migrants.

On average, temporary migrants were more likely than non-migrants to have behaved in disrespect for laws or social norms and to be living alone by themselves. The differences in the likelihood of living alone across the four migrant-by-gender groups were particularly striking. Overall, the migrant and non-migrant differences in both measures of lax social control were more pronounced among females

than males. In fact, there was no significant difference in the normlessness scale between temporary migrants and non-migrants for males. Regardless of migrant status, males scored considerably higher on the normlessness scale than females.

For social influences, female temporary migrants had the greatest exposure among the four migrant-by-gender groups to family members and peers who had risky sexual behaviors. For both measures, the migrant and non-migrant difference was again more pronounced among females than males. In fact, the difference in the measure of family influence between male temporary migrants and non-migrants was not even statistically significant. Interestingly, while female non-migrants scored lower on both measures than their male counterparts, female temporary migrants scored considerably higher on both than male migrants.

For risky sexual behaviors in the month prior to the interview, migrant and non-migrant differences were strikingly different between male and female respondents (Table 4). For female respondents who were HIV+/drug user, temporary migrants (column 1) were much more likely than non-migrants (column 3) to report having each of the eight risky sexual behavior and to score higher in the composite risky sexual behavior index, although some of the large differences were statistically not significant (most probably due to the small number of female temporary migrants who were HIV positive or drug user). For females who were not HIV+/drug user, temporary migrants (column 2) were significantly different and sexually riskier than non-migrants (column 4) in eight of the nine indicators. On average, the migrant and non-migrant differences were more pronounced among females who were not HIV+/drug user than those who were. By contrast, in none of the indicators (each risky sexual behavior or the composite index) and regardless of HIV+/drug user or not, did male temporary migrants differ significantly from non-migrants.

(Table 4 about here)

Further, among non-migrants (columns 3 and 4), males, particularly males who were not HIV positive or drug user, appeared to have engaged in significantly more risky sexual behaviors than females (significance tests between males and females controlling for migrant and HIV+/drug user status were not

shown, but available upon request). But among temporary migrants (columns 1 and 2), females, regardless of HIV+/drug user or not, reported significantly more risky sexual behaviors than males in almost every indicator. The only exception was among those who were not HIV+/drug user (column 2), for whom female temporary migrants were slightly less likely (13.3 per cent) than male migrants (15.0 per cent) to have reported drinking while having sex. In particular, compared to their male counterparts, female temporary migrants who were not HIV+/drug user (column 2) were almost 15 times as likely (20.8 vs. 1.4 per cent) to have multiple casual sexual partners and more than six times as likely (19.6 vs. 2.9 per cent) to have multiple casual sexual acts in the month prior to the interview. The results indicated clear gender-migration interaction in that being temporary migrant appeared to be a significant and powerful risk factor of STD/HIV risky sexual behaviors for females but not males. Female temporary migrants, regardless of HIV+/drug user or not, were at a significantly elevated risk of having multiple casual sexes with multiple partners.

For more definitive analyses of the correlates of STD/HIV risky sexual behaviors, including the gender-migration interaction, we turn next to multilevel multiple regression analysis. When only individual level variables were examined (Model 1, Table 5), temporary migrant status was a significant risk factor as expected. Other things being equal, being temporary migrant was significantly associated with more risky sexual behaviors. Being HIV positive or a drug user was not significantly associated with risky sexual behaviors. As expected, age and being married were both negatively associated with risky sexual behavior. The deterrence of marriage was particularly strong, and being married had in fact the second largest coefficient (-0.5516) among all variables in the model. Somewhat surprising and also seemed contradictory to what would be expected given the usually more lenient social norms toward males' sexual behavior, our result suggested that males were less likely than comparable females to engage in risky sexual behaviors.

(Table 5 about here)

All three indicators of economic marginalization were significantly associated with risky sexual behaviors. Employment in service and entertainment industries was a particularly powerful risk factor,

increasing the risky sexual behavior index by more than a half point. Of the two individual psychosocial wellbeing indicators, only the depression scale was statistically significant. As expected, experience of depression was significantly associated with more risky sexual behaviors. Lastly, both indicators of lax social control were significantly associated with more risky sexual behaviors. Living alone by oneself appeared to be a very powerful risk factor.

To further test if the relationship between temporary migration and risky sexual behavior varies between males and females, we included an interaction between the male and the migrant dummy variables in the analysis. In addition, given the striking migrant and non-migrant differences between males and females in marital status, employment status, and living arrangement (see Table 3) and potential interactions between (1) gender and HIV+/drug user status and (2) temporary migration and HIV+/drug user status, six more interaction terms were included in the model. The results (Model 2) showed that three of the seven interaction terms were statistically significant: male by temporary migrant, male by married, and male by living alone. The signs of the three significant interaction terms all suggested that the associations between being a temporary migrant, married, and living alone and risky sexual behaviors varied and were all significantly stronger for females than for males. Test of model fit between Models 1 and 2 confirmed that the interactive model fitted significantly better than the non-interactive model (Likelihood-ratio χ^2=263.1; p<0.001).

Combining the coefficients for temporary migrant, male, married, living alone, and the interactions between male and the other three, the results in Table 6 illustrate the interactions of gender, temporary migration, marriage, and living arrangement in influencing risky sexual behaviors. Of the eight male-female comparisons, males would have more risky sexual behaviors than females only among the married non-migrants living with others; females would be sexually more risky than males in all other groups. Single female temporary migrants who live alone would be sexually the most risky while female married non-migrants who live with others would have the least risky sexual behavior.

(Table 6 about here)

For both Models 1 and 2 (Table 5), the standard deviation for the random intercept was

statistically highly significant, indicating that through whatever mechanisms PSU's unique social and physical environments also had significant influences over individual's risky sexual behaviors. Further control of social and community influence indicators in Model 3 (Table 5) suggested that none of the three PSU characteristics showed any significant and independent relationship to individual risky sexual behavior. However, measures of family and peer influence were both significant. Other things being equal, respondents who had family members and/or peers known to have risky sexual behaviors had significantly more risky sexual behaviors themselves than those who did not. The fact that the standard deviation for the random intercept in Model 3 remained highly significant further indicates that PSU characteristics other than urban residence, divorce ratio, and number of entertainment establishment may exert influence over individual sexual behavior. Future research is needed to ascertain what these other community characteristics are, which potentially mediate between community social, economic, and normative contexts and individual sexual behavior.

Finally, males and females were examined separately (Table 7) to highlight the indicated gender difference in the migration-sexual behavior link and to ascertain any other gender-specific individual and community correlates of risky sexual behaviors. Several male-female differences were apparent. First, being temporary migrant was associated with significantly fewer risky sexual behaviors for males. But it was associated with significantly more risky sexual behaviors for females. Second, being HIV positive or a drug user was significantly correlated with risky sexual behaviors for males. It had no significant implication for risky sexual behaviors for females. Third, while being married was associated with significantly fewer risky sexual behaviors for both males and females, the association was much stronger for females (-1.01) than males (-0.16). Fourth, whether and where one was employed made no difference for males; it carried significant implications for risky sexual behavior for females. Unemployed, employed in service/entertainment industry, and employed in unspecified sectors were all positively associated with more risky sexual behaviors for females. Fifth, presence of family members with known risky sexual behaviors was significantly associated with more risky sexual behaviors for males; it made no difference for females, whose risky sexual behaviors appeared to be influenced more by peers than

family members. Lastly, there seemed to be more PSU influence over female's than male's risky sexual behaviors and correspondingly a higher intra-PSU correlation (defined as the ratio between model random intercept variances and the model total variances (not shown)) in risky sexual behaviors for females (0.02) than for males (0.01).

(Table 7 about here)

Discussion and Conclusions

Although the relationship between temporary migration and STD/HIV risky sexual behavior in China has captured a great deal of research attention, whether migrant men and women are equally vulnerable to risky sexual behavior has not received much attention until very recently (Yang 2006; Yang and Xia 2006). Systematic analysis of potential gender-migration interaction in understanding risky sexual behavior is still limited in China. Using a unique survey data set and applying multilevel modeling, this paper focuses on the gender-migration interaction and examines gender-specific individual and community level correlates of STD/HIV risky sexual behavior.

The results suggest strong interaction between gender and migration; female temporary migrants have disproportionately more STD/HIV risky sexual behaviors than male migrants. In fact, the observed higher level of risky sexual behavior among temporary migrants as a whole appears to be mainly attributable to female migrants' much elevated level of risky sexual behavior. Male temporary migrants have actually fewer risky sexual behaviors than comparable male non-migrants. Therefore, the usual portrayal in the media and the literature of male migrants' increased risky sexual behavior may be misinformed due to the failure to recognize gender differences.

In addition, our analyses also reveal significant gender-marriage and gender-living arrangement interactions in risky sexual behaviors. Other things being equal, being married and living alone appear to have significantly more deterrence for females than males in risky sexual behaviors. Together, the findings suggest that behavioral control by spouse, family, and others in one's social network may be gendered in China in that the sexual behavior of women is under tighter scrutiny than that of men. By moving away and living alone, temporary migration may help to weaken such behavioral control and

allow women more freedom in sexual relationships, leading to disproportionately more risky sexual behaviors among female temporary migrants. Other things being equal, single female temporary migrants who live alone would have the most risky sexual behaviors while married female non-migrants who live with other would have the least.

The main mediating factors between temporary migration and migrants' riskier sexual behavior in general and the gendered migration-sexual behavior link in particular appeared to be declining economic and psychosocial wellbeing and weakened social and normative control experienced by temporary migrants. In all the measures, the results suggest that female temporary migrants fare poorer than female non-migrants and in all but one measure poorer than both male temporary migrants and non-migrants. In other words, compared to female non-migrants and male migrants, female temporary migrants are economically more marginalized and socially more isolated and also experience greater degree of lax social and normative control, all of which may individually and jointly contribute to their disproportionately more risky sexual behaviors. Particularly striking was the sharply different labor force experience between female and male temporary migrants and its implication for risky sexual behavior. Female temporary migrants not only have a much higher unemployment rate and if employed are overwhelmingly in service/entertainment or other informal industries. Their unemployment and concentration in service/entertainment industries are also significant risk factors of risky sexual behaviors. By contrast, whether and where employed have no relationship to risky sexual behavior for male temporary migrants.

As expected, family members and peers exert significant influences in risky sexual behavior. Other things being equal, individuals who have family members and/or peers with risky sexual behavior are more likely to be sexually riskier themselves. While both female and male temporary migrants appear to have a sexually riskier social network of family and peers than their respective non-migrant counterparts, the migrant and non-migrant difference is more pronounced among females than males. Of the four migrant-by-gender groups, female temporary migrants are the most likely to have both family members and peers with known risky sexual behaviors.

Although none of the PSU characteristics show any significant relationship to risky sexual behavior, the highly significant variances in the random intercept of all the multilevel models suggest that individual sexual behavior is significantly influenced by community contexts. The lack of significant difference between rural and urban residence is surprising, but appears to be consistent with previous research, which suggests that since the early 1980s both rural and urban areas in China have undergone revolutionary changes in social and behavioral norms about marriage, family, and sexuality (Farrer 2002; Pan, 2004; Yan 2003). It is possible that the association between urban residence and risky sexual behavior is mainly mediated by the other variables included in the analysis. Future research on risky sexual behavior and its link to temporary migration needs to pay more attention to social influences of community and to search for community characteristics that potentially mediate between community contexts and individual risky sexual behavior.

In addition to gender-migration interaction, the other important and somewhat surprising finding is that, in contrast to what would be expected given the gendered role and behavior expectations in Chinese culture, women are found to be sexually more risky than comparable men. Only marriage and living with others, both may be indicative of more behavioral control by family and others in the social network, seem to reduce women's risky sexual behaviors, thereby narrowing the female and male difference (see Table 6). The registration-based over sampling of temporary migrants may potentially overstate female temporary migrants' risky sexual behaviors because if female migrants were more likely to register than male migrants. However, the fact that even female non-migrants, except for those who live with others, in our sample also appear to have more risky sexual behaviors than their male counterparts suggests that potential sample bias aside women in contemporary China may indeed sexually riskier than men once other factors are controlled for.

It is also possible that women's riskier sexual behavior as revealed in this study result from the control of other individual and community characteristics in the analysis. In other words, men's usually expected freer and riskier sexual behavior may be largely mediated through one or more of the control variables. To test that possibility and better understand the seemingly counterintuitive gender differences

in risky sexual behavior, we conducted additional stepwise regression analyses, in which the control variables were entered one at a time to see if and how the coefficient for the male dummy variable might change. The results (not shown but available upon request) indicated that the extent of social control or lack of it (as measured by the normlessness scale and living alone dummy variable) appeared to be the most important mediator. In fact, males showed slightly more, though not statistically significantly more, risky sexual behaviors than females until the two indicators of lax social control were controlled for in the model. Thus, men's usually freer and more risky sexual behavior may result mainly from gendered normative and social control over sexual behavior. Once that is controlled for, females seem to be at least as likely, perhaps more likely, as males to engage in risky sexual behavior in contemporary China.

Some limitations of the study are worth repeating. First, the study is not representative of the province, nor is it representative of China's more developed coastal provinces. In particular, the 40 PSUs included in the study have on average more entertainment establishments and higher prevalence of crimes, commercial sex, and STDs (Table 1). As such, the sample may be sexually "riskier" than the general population in China. Second, the reliance on official registrations in sampling may introduce biases due to incomplete or different coverage of the study population in the various registrations. Third, except for PSU characteristics, all other information is based on self-reporting. Many factors may affect the accuracy of self-reporting, including memory lapse, social desirability, and knowledge about family members' and peers' sexual and/or drug using behaviors. And fourth, the study design is cross-sectional, which makes it impossible to pin point the exact causal relationship between temporary migration (and many other variables) and risky sexual behavior. A longitudinal design that incorporates biomarkers (to verify self-reported behavior) and includes more representative geographic locations and study populations is highly recommended for future research in China.

With these study limitations in mind, it appears that times may have changed as recent socio-economic development in China has been accompanied by dramatic changes in social norms about love, marriage, family, and sexuality. Pre- and extra marital sex is increasingly tolerated. Women in particular may have benefited from the changes, which grant them greater freedom now than ever before in sexual

expression and relationships. It is unlikely that gendered norms about sexual behavior have disappeared all together, but gender difference in behavioral norms may be narrowing, at least in the places studied. Rural-urban temporary migration may further help women to break away from remaining gendered behavioral control by family and home community, thereby allowing female migrants even more freedom in sexual relationships than they could otherwise without migrating.

Unfortunately, as revealed in the analysis, the newly acquired freedom by Chinese women in sexual relationships seems to have come at a potential health cost because their greater sexual freedom has been associated with more STD/HIV risky sexual behaviors. Part of the irony may lie in the seemingly lack of parallel improvement in women's social and economic status and their relationship power. Although the study does not provide any direct measure of relationship power, it is reasonable to speculate that greater economic marginalization and social isolation experienced by women, particularly migrant women, would be associated with greater economic and emotional dependence on their partners and consequently diminished personal control and relationship power in sexual relationships.

To reduce female temporary migrants' risky sexual behavior, it appears necessary to improve their economic wellbeing and social integration in cities. Policy measures to alleviate social, cultural, and institutional constraints that limit female temporary migrants' equal access to urban employment are urgently needed. One unforeseen yet manifest consequence of structural changes amid swift market transition in China is the weakening of institutional guarantee for gender equality in the work place and the resurfacing of negative stereotyping of women that has fueled discrimination against women, particularly temporary migrant women (Fan, 2003). It is imperative that policy measures be taken to reinstitute and re-enforce the principle of gender equality, to eliminate discrimination against female temporary migrants in hiring, and to make every option equally available to female temporary migrants who are otherwise fully qualified.

It may also be the time for policy makers in China to seriously consider the option of abolishing or at least drastically reforming the household registration system to completely de-link access to employment and social services from the possession of a local permanent household registration. As this

study and others (Yang, Derlega, and Luo 2007) clearly suggest, the lack of local permanent household registration is the key to temporary migrants' economic marginalization, social isolation, and lax social/normative control and in turn to their risky sexual behavior in places of urban destination. The removal of the man-made divide between the local-household-registration haves and have-nots would greatly facilitate the full integration of female temporary migrants. This will likely reduce female temporary migrants' economic marginalization and social isolation, improve their psychosocial wellbeing, decrease their economic and emotional dependence on male partners, and enhance their personal control and relationship power in social and sexual relationships, thereby reducing their risky sexual behavior.

Until then, studies of migration and STD/HIV risky sexual behavior must pay attention to issues of gender and gender-migration interaction and address contextual risk factors, including social influences of migrants' broader social networks of peers, friends, and family. Prevention intervention programs are urgently needed to target female temporary migrants, particularly the young and single female temporary migrants living alone, who may be sexually the most risky. To be effective, such prevention interventions must go beyond female temporary migrants to also target their male sexual partners and larger social networks of family and peers.

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Table 1. Selected 1996-2000 Average Township/Neighborhood Level Characteristics of the Province As a Whole and the 40 PSUs Included in the Sample Survey[1]

Average Socioeconomic Indicators	Province as a Whole (N=1,611)	Survey Sample (N=40)
Population size	24,953	43,562
Percent urban	14.3	25.3
Percent households under poverty	17.5	7.1
Registered temporary migrants	740	1,728
Of whom percent of females	36.4	19.5
GDP per capita (yuan)[2]	45,915	36,384
Rural income per capita (yuan)	1,144	1,606
Drug prevalence index[3]	6.9	18.0
Commercial sex prevalence index[4]	2.5	5.1
Number of entertainment establishment	18	32
Crime prevalence index[5]	7.4	12.4
HIV prevalence index[2,6]	4.6	6.2
Reported STDs[2]	84	269

Notes: [1] Data presented are mean aggregate annual statistics for the five-year period between 1996 and 2000. The unit of observation (aggregation) is rural township, urban town, or neighborhood in cities.

[2] The statistics are at the county/city level. At the time of the study, there were 128 counties/cities in the province. The 40 PSUs of the survey sample were located in 8 counties/cities.

[3] The index is based on registered drug users. For protection of confidentiality of the local community, the original numbers of registered drug users were classified and converted into the index, ranging from 0 (low) to 34 (high), before the data were released.

[4] The index is based on prostitution related arrests. For the same reason of confidentiality, the original numbers were classified and converted into the index, ranging from 0 to 19.

[5] The index is based on reported crimes. For the same reason of confidentiality, the original numbers were classified and converted into the index, ranging from 0 to 26.

[6] The index is based on reported new cases of HIV infection. For the same reason of confidentiality, the original numbers were classified and converted into the index ranging from 0 to 9.

Table 2. Comparison of the Original Sample and the Sub-Sample Used in the Analysis

Sampling Category/ Actual Status[1]	Original Sample		Sub-Sample Used in the Analysis (Sexually Active Only)
	Sexually Active	Not Sexually Active[2]	
Person with HIV/AIDS	319	20	332
Drug user	941	97	1,037
Temporary migrant	1,285	305	1,285
Non-migrant	2,149	243	3,361

Notes: [1] Sampling categories (apply to the original sample) refer to the categories used as sampling frameworks in the original sample selection; they are mutually exclusive. The actual statuses (apply to the sub-sample used in the analysis) refer to respondent's actual status as reported in the questionnaire; they are not mutually exclusive as respondents can have multiple statuses, e.g., a respondent with HIV is also a drug user. The actual status classifications also include those respondents whose status is unknown (therefore not classified correctly in the sampling categories) but revealed during the interview. As a result, the numbers by original sampling categories will not match those by actual statuses.

[2] Also included here are small numbers of respondents (1, 4, 10, and 8 cases for person with HIV/AIDS, drug user, temporary migrant, and non-migrant, respectively) with missing value on sexual activities in the 30 days prior to the survey.

Table 3. Sample Characteristics of Sexually Active Individuals 18 to 55 Years of Age, by Gender and Temporary Migrant Status

	Females		Males	
	Migrants	Non-migrants	Migrants	Non-migrants
Socio-Demographic Characteristics:				
Age (mean)	28.4	33.7**	32.2	34.4**
	(540)	(1,160)	(730)	(2,184)
Currently married (%)	55.6	95.3**	83.9	89.3*
	(541)	(1,161)	(733)	(2,184)
HIV+/drug user (%)	0.6	0.4	0.6	1.8**
	(541)	(1,161)	(733)	(2,188)
Education (%)				
Illiterate	13.9	14.6**	5.9	9.7*
Elementary school	40.5	25.0**	35.0	28.3*
Junior high school	39.8	39.4**	44.0	38.0*
Senior high school or more	5.8	21.0**	15.1	24.0*
	(541)	(1,156)	(733)	(2,184)
Economic Marginalization Indicators (%):				
Unemployed	14.2	7.4**	4.2	4.8**
Employed in unspecified sectors	9.0	10.8**	6.2	10.6**
Employed in service/entertainment	46.1	4.5**	10.9	1.9**
Employed in all other sectors	30.7	77.3**	78.8	82.7**
	(540)	(1,158)	(733)	(2,186)
Individual Psychosocial Wellbeing:				
Depression scale (mean)	37.6	33.2**	32.2	32.3
	(541)	(1,160)	(733)	(2,188)
Loneliness scale (mean)	41.7	36.9**	38.7	36.5**
	(541)	(1,158)	(733)	(2,188)
Lax Social Control:				
Normlessness scale (mean)	0.5	0.2**	0.7	0.6
	(541)	(1,158)	(733)	(2,184)
Living alone (%)	22.2	0.9**	14.8	0.2**
	(541)	(1,161)	(733)	(2,188)
Social Influences:				
Family with risky behavior (%)	8.3	2.4**	3.5	2.7
	(541)	(1,161)	(733)	(2,188)
Peers with risky behavior (%)	30.9	8.6**	24.5	17.3**
	(541)	(1,161)	(733)	(2,188)

Notes: Results are based on "svy" methods in STATA and adjusted for sampling probability and survey design. Statistical significance tests are based on comparison between temporary migrants and non-migrants. The numbers in parentheses are unweighted sample sizes.

* $p < 0.05$; ** $p < 0.01$.

Table 4. Risky Sexual Behaviors in the 30 Days Prior to Interview among Sexually Active Individuals 18 to 55 Years of Age, by Gender, Migrant Status, and Risk Groups

	Temporary Migrants		Non-Migrants		
Risky Sexual Behaviors	HIV+/ Drug User	Not HIV+/ Drug User	HIV+/ Drug User	Not HIV+/ Drug User	Total sample
Females:					
Had casual sex (%)	67.9**	31.3**	24.5	1.8	4.3
	(13)	(512)	(98)	(1,024)	(1,647)
Had unprotected casual sex (%)	36.8**	5.4**	3.5	1.1	1.4
	(13)	(512)	(98)	(1,024)	(1,647)
Involved in commercial sex (%)	59.0	24.4**	26.8	0.2	2.3
	(13)	(519)	(99)	(1,050)	(1,681)
Had more than one casual partner (%)	64.8	20.8**	23.1	0.1	1.9
	(13)	(528)	(100)	(1,061)	(1,702)
Had more than one casual sexual act (%)	39.9**	19.6**	4.8	1.8	3.3
	(13)	(528)	(100)	(1,061)	(1,702)
Drinking while having sex (%)	30.8**	13.3**	1.6	2.4	3.3
	(13)	(528)	(100)	(1,061)	(1,702)
Taking drugs while having sex (%)	40.7	<0.1	27.3	<0.1	0.1
	(13)	(528)	(100)	(1,061)	(1,702)
Had IDU sexual partner (%)	66.5**	2.8**	9.0	<0.1	0.4
	(13)	(528)	(100)	(1,061)	(1,702)
Composite sexual behavior index (mean)	4.1	1.2**	1.2	<0.1	0.2
	(13)	(528)	(100)	(1,061)	(1,702)
Males:					
Had casual sex (%)	12.6	5.8	13.4	4.8	5.0
	(46)	(664)	(884)	(1,244)	(2,838)
Had unprotected casual sex (%)	10.0	2.8	9.5	3.2	3.3
	(46)	(664)	(884)	(1,244)	(2,838)
Involved in commercial sex (%)	14.2	5.2	13.1	3.0	3.4
	(47)	(674)	(894)	(1,256)	(2,871)
Had more than one casual partner (%)	4.5	1.4	6.2	1.0	1.2
	(47)	(686)	(910)	(1,278)	(2,921)
Had more than one casual sexual act (%)	7.8	2.9	10.9	3.9	4.0
	(47)	(686)	(910)	(1,278)	(2,921)
Drinking while having sex (%)	18.4	15.0	15.0	14.6	14.6
	(47)	(686)	(910)	(1,278)	(2,921)
Taking drugs while having sex (%)	24.3	0.0	11.6	<0.1	0.3
	(47)	(686)	(910)	(1,278)	(2,921)
Had IDU sexual partner (%)	20.7	0.2	11.2	0.2	0.4
	(47)	(686)	(910)	(1,278)	(2,921)
Composite sexual behavior index (mean)	1.1	0.3	0.9	0.3	0.3
	(47)	(686)	(910)	(1,278)	(2,921)

Note: Results are based on "svy" methods in STATA and adjusted for sampling probability and survey design. Statistical significance tests are based on comparison between temporary migrants and non-migrants in the same HIV/drug using status, i.e., column 1 to column 3 and column 2 to column 4. The numbers in parentheses are unweighted sample sizes.
** $p < 0.01$.

Table 5. Regression Analysis of Risky Sexual Behaviors in the 30 Days Prior to the Interview among Sexually Active Individuals 18 to 55 Years of Age[1]

Explanatory Variables	Model 1	Model 2	Model 3
Migrant Status:			
Temporary migrant[2]	0.1130**	0.2831**	0.2594**
Individual Socio-Demographic Characteristics:			
HIV+/drug user[2]	0.0434	-0.0702	-0.1589
Age	-0.0105**	-0.0084**	-0.0069**
Married[2]	-0.5516**	-1.2269**	-1.0827**
Male	-0.0862*	-0.7903**	-0.7018**
Education[2]			
Elementary school	0.2097**	0.1627**	0.1634**
Junior high school	0.0976	0.0782	0.0576
Senior high school or more	0.0889	0.0855	0.0639
Economic Marginalization Indicators[2]			
Unemployed	0.2260**	0.2550**	0.2420**
Service/entertainment	0.5534**	0.2444*	0.2198*
Unspecified sector	0.1921**	0.1649*	0.1949**
Individual Psychosocial Wellbeing:			
Depression scale	0.0154**	0.0129**	0.0110**
Loneliness scale	0.0006	0.0012	0.0027
Social Control:			
Normlessness scale	0.1704**	0.1904**	0.1473**
Living alone[2]	0.5277**	0.8721**	0.8360**
Interactions			
Male by temporary migrant	/	-0.4088**	-0.3931**
Male by married	/	1.0540**	0.9377**
Male by unemployed	/	-0.1499	-0.1299
Male by service/entertainment	/	-0.0804	-0.0029
Male by HIV+/drug user	/	0.2217	0.2985*
Male by living alone	/	-0.6865**	-0.6804**
Migrant by HIV+/drug user	/	0.0609	0.0858
Social and Community Influences			
Family influence[2]	/	/	0.4181**
Peer influence[2]	/	/	0.4721**
Urban residence[2]	/	/	0.1086
PSU divorce ratio	/	/	-0.0189
PSU entertainment establishments	/	/	-0.0006
Random Intercept Standard Deviation	0.1373**	0.1342**	0.1105**
Unweighted Sample Size	4,586	4,586	4,586
Model Likelihood Ratio χ^2	1,193.8**	1,456.8**	1,625.1**

Notes: [1] Results are maximum likelihood estimates based on "xtreg" modeling in STATA.

[2] Variables entered as dummy variables. The reference categories are non-migrant for "temporary migrant;" not HIV+ or drug user for "HIV+/drug user;" not currently married for "married;" illiterate for the three education dummy variables; all other employment sectors for the three employment sector dummy variables; living with others for "living alone"; no known family member with risky sexual behaviors for "family influence;" no known friends/peers with risky sexual behaviors for "peer influence;" and rural for "urban residence."

* $p < 0.05$; ** $p < 0.01$.

Table 6. Differences in Risky Sexual Behaviors in the 30 Days Prior to the Interview by Marital Status, Temporary Migrant Status, Living Arrangement, and by Gender among Sexually Active Individuals 18 to 55 Years of Age

Temporary Migrant by Marital Status and by Living Arrangement	Females (N=1,685)	Males (N=2,901)
Single non-migrants living with others	0.00	-0.79
Single non-migrants living alone	0.87	-0.60
Married non-migrants living with others	-1.23	-0.96
Married non-migrants living alone	-0.35	-0.78
Single temporary migrants living with others	0.28	-0.92
Single temporary migrants living alone	1.16	-0.73
Married temporary migrants living with others	-0.94	-1.09
Married temporary migrants living alone	-0.07	-0.90

Note: Results are based on Model 2 of Table 5 and calculated as the relative difference from single female non-migrants living with others (baseline category) in the composite risky sexual behavior index.

Table 7. Regression Analysis by Gender of Risky Sexual Behaviors in the 30 Days Prior to the Interview among Sexually Active Individuals 18 to 55 Years of Age[1]

Explanatory Variables	Males	Females
Migrant Status:		
Temporary migrant[2]	-0.1194*	0.2332**
Individual Socio-Demographic Characteristics:		
HIV+/drug user[2]	0.1739**	-0.1641
Age	-0.0064*	-0.0063*
Married[2]	-0.1578*	-1.0097**
Education[2]		
Elementary school	0.1710*	0.1289
Junior high school	0.0255	0.0952
Senior high school or more	0.0550	0.0500
Economic Marginalization Indicators[2]		
Unemployed	0.0904	0.2785**
Service/entertainment	0.1807	0.2814**
Unspecified sector	0.0324	0.4621**
Individual Psychosocial Characteristics:		
Depression scale	0.0097**	0.0131**
Loneliness scale	0.0011	0.0043
Social Control:		
Normlessness scale	0.1504**	0.1537**
Living alone[2]	0.1550	0.8203**
Interactions:		
Migrant by HIV+/drug user	0.1129	-0.0163
Social and Community Influences		
Family influence[2]	0.5563**	0.2010
Peer influence[2]	0.3954**	0.6308**
Urban residence[2]	0.0997	0.1177
PSU divorce ratio	-0.0147	-0.0292
PSU entertainment establishments	-0.0001	-0.0013*
Random Intercept Standard Deviation	0.1389**	0.1566**
Unweighted Sample Size	2,901	1,685
Model Likelihood Ratio χ^2	598.2**	1,061.0**

Note: See notes 1 and 2 in Table 5.

* p <0.05; ** p <0.01.