Migration, Behavior Change, and HIV/STD Risks in China*

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Abstract

Using data from a population-based survey in 2003 (3,465 males and 2,007 females), this paper examines how temporary migration increases the risk for HIV/STDs in China. Comparing migrants directly with non-migrants, the results suggest that temporary migrants had significantly higher prevalence rates of HIV risk sexual and drug using behaviors, but no statistically significant differences were found between migrants and non-migrants in prevalence of HIV/STDs. Employing logistic regression analysis, we examined three mechanisms--migration selectivity, lax social control, and social isolation--by which the process of migration may lead to behavior changes that increase migrants' HIV/STD risks. The analyses indicate that post-migration lax social control, which resulted from migrants' detachment from family and home community, was the most significant mediating factor between migration and HIV risk behaviors. Temporary migrants are at high risk of HIV/STDs; prevention interventions need to pay particular attention to migrants' post-migration lax social control.

Key Words: HIV/STDs, Migration, Risk Behaviors, China

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With 840,000 people officially estimated to be living with HIV/AIDS in 2003 in China, AIDS has evolved from being perceived as a disease of foreigners to an epidemic that has affected every population group and geographic location in the country (Grusky, Liu and Johnston, 2002; China MOH and UNAIDS, 2003; Wu, Rou and Cui, 2004). Official statistics, though underestimates of the true magnitude of the epidemic, suggest that the number of new HIV infection in China doubled or tripled year to year in the early 1990s and grew on average 44% annually between 1994 and 2002 (Xu, 2001; China MOH and UNAIDS, 2003). Although the overall prevalence rate of HIV remains low at present, less than 0.1% among the adult population, hundreds of thousands of people have been infected. If the current trend continues, up to 10 million people could be infected by the end of the decade (UNAIDS, 2002), creating serious public health problems and threatening national security, social stability, and economic development in China (China MOH and UNAIDS, 2003). In this paper, we summarize risk factors for HIV/STDs in China, especially migration, and then present a study documenting how migration, through its impact on behavior changes, increases the risk for HIV/STDs in China.

Background

Nationwide, the dominant route of HIV transmission in China is needle sharing while injecting drugs; but sexual transmission of the AIDS virus is on the rise, reaching 10.9% in 2002, and represents the fastest growing source of new infections (China MOH and UNAIDS, 2003). In coastal provinces and metropolitan areas, however, sexual transmission of HIV is much more important, accounting for more than one third of the new infections in recent years. Both growing drug use and increasing promiscuity in contemporary China have and may continue to fuel the growth and spread of HIV. In 2003, official statistics reported more than one million registered drug users nationwide with the actual number of drug addicts probably many times larger (Xinhua News, 2004). While very few in the country injected drugs before 1990, a number of studies reported sharp increases in the proportion of drug users who injected drugs and, among injecting drug users, a growing number shared used needles without appropriately cleaning them first (Zheng et al., 1994; Yu et al., 1996; Wu et al., 1997; Lai et al., 2000; Yang, Yao and

Chen, 2001). Similarly, despite government's crackdown on prostitution, commercial sex is thriving and widespread in China (Gil et al., 1996; Pan, 1999; Hyde, 2000; Rogers et al., 2002; Yuan, 2003). Visitors to Chinese cities today can hardly miss noticing the flourishing entertainment industry, where commercial sex is widely suspected; it is also not uncommon to receive phone solicitations for "services" in hotel rooms. Further, the resurgence and widespread of other sexually transmitted diseases (STDs) indicate widespread unprotected casual sex and underscore the potential for fast spread of HIV through sexual transmission (van den Hoek et al., 2001; Qu et al., 2002; Parish et al. 2003).

The resurgence of STDs and the quick spread of HIV in China can be best understood in the context of the profound social and economic changes that have accompanied China's economic reforms and drives toward modernization (Weniger and Berkley, 1996). As market transition deepens and urbanization quickens, more and more people who are ill-prepared for the unprecedented social and economic changes may develop a sense of loss and insecurity and experience a decline in psychological well-being, which may be conducive to drugs and casual sex as distraught people seek ways to release frustration and bury anxieties. In particular, increasing temporary migration has been portrayed by the media and implicated in the literature as the main catalyst in the spread of drugs and commercial sex and consequently blamed for the spread of HIV/STDs in China.

The growth of temporary migrant population in China since the early 1980s has indeed been phenomenal. Although the exact size of temporary migrant population is hard to determine, census data revealed that the total number of temporary migrants had increased from around 11 million in 1982 to more than 79 million in 2000 (Liang and Ma, 2004) and estimated 120 million currently (China MOH and UNAIDS, 2003). The uprooting and on the move of population of such magnitude has undoubtedly had its impacts felt in every aspect of socioeconomic life, including social order and prevalence of crimes and deviant behaviors. In fact, residential immobility was considered the most important factor that explained the largely absence of illicit drugs and commercial sex in pre-reform China (Troyer, Whyte and Parish, 1984; Clark and Rojek, 1989; Situ and Liu, 1996).

However, despite speculation in the literature, research that compares temporary migrants directly

with non-migrants in terms of HIV risk drug using and sexual behaviors and prevalence of HIV and STDs is limited. Using data from a large and population based survey conducted in southwestern China in 2003, this paper examines differences in prevalence of HIV risk behaviors and HIV/STD infections between migrants and non-migrants and explores mechanisms by which the process of migration may lead to behavior changes that increase migrants' HIV/STD risks.

Migration and Spread of HIV/STDS

Numerous studies in China and other developing countries have cited increasing migration as one of the most important factors leading to the rapid spread of HIV/STDs (Jochelson, Mothibeli and Leger, 1991; Brockerhoff and Biddlecom, 1999; Skeldon, 2000; UNAIDS, 2001; Wolffers et al., 2002; Anderson et al., 2003; Li et al., 2004). Studies in the more developed countries, too, highlight the vulnerability of migrant workers to HIV/STDs and the subsequent spread of the diseases through migrant travel (McCoy, Correa and Fritz, 1996; Organista and Organista, 1997; Wallace et al., 1997; Gras et al., 1999; Lansky et al., 2000; Wallman, 2001).

From an epidemiological perspective, the spread of infectious diseases has always been associated with the movement of people. Migration brings more people into close contact and creates a greater mixing of people at places of destination, which provides the ready environment for disease transmission. Through the movement of infected persons, migration in turn offers a convenient vehicle to transport diseases to places where they are previously unknown. A number of studies have established that the AIDS epidemic tends to spread geographically along transport connections, trade routes, and migration systems, and socially along personal and social networks (Obbo, 1993; McCoy et al., 1996; Wallace et al., 1995, 1997; Wood et al., 2000). The existence of migrant and other personal or social networks shapes the sociogeographic patterns of the distribution of HIV; the frequency, intensity, and mode of network contacts in turn determine the rate of HIV transmission in a specific location or for a specific population group. A recent study in China also suggests that the prevalence of HIV/STDs in a community is positively correlated with the intensity of migration in the community (Yang, 2005).

However, unlike other infectious diseases, the transmission of HIV and STDs requires intimate

personal contacts involving specifically the exchange of body fluids. As such, migration itself will not spread the AIDS virus and other STDs; it will do so only if the process of migration renders migrants vulnerable to certain HIV/STD risk behaviors and facilitates the diffusion of such behaviors. Accordingly, the search for the migration and HIV link must go beyond migration's roles as virus carrier and population mixer to identify and understand ways by which the process of migration leads to behavior changes that increase migrants' risk to HIV/STDs. Two broad theoretical perspectives help to shed light on the link between temporary migration, behavior changes, and migrants' vulnerability to HIV.

The first is social control theory (Gibbs, 1982; Black, 1984; Akers, 1985). The basic premise of social control theory is that individuals behave in accordance with social norms because they fear the negative sanctions that may result from the violation of these norms. Each society or community has its own formal and normative structure through which it enforces individuals to conform to its norms (Coser, 1982). As such, in communities where anonymity and privacy are compromised by close interpersonal contacts and relationships, it is difficult for people to act in ways that are proscribed by social norms because their acts can be easily detected and sanctioned. Once anonymity prevails or individuals are detached from the social and normative control structure, they "can more easily contemplate deviance without much fear of being detected, reported, and caught" (Whyte and Parish, 1984:234).

Many temporary migrants work and live in cities without the company of families. The separation from family can disrupt not only their family life but also regular sexual relationships and thereby become "an unremitting source of anxiety" for migrants (Jochelson et al., 1991:163). This is presumably conducive to casual sex and/or dependence on alcohol or drugs as a way to escape loneliness, to bury anxieties about work and family, and to release sexual frustration (Jochelson et al., 1991; Caldwell, Anarfi and Caldwell, 1997; Brockerhoff and Biddlecom, 1999). But more importantly, the separation from family and home community may also create some sort of social control vacuum whereby temporary migrants feel less constrained by social norms since families and friends back home are unlikely to find out what they do while away from home (Konde-Lule, 1991; Yang, 2001). Thus, the more anonymous life and easier access to commercial sex and illicit drugs in the city together may help

temporary migrants to break away from social norms of morality and sexual fidelity and encourage them to seek casual sex or other socially deviant behaviors.

The other general social theory that helps to explain temporary migrants' vulnerability to HIV/STD risk behavior is the social isolation perspective (Wilson, 1987). According to Wilson, social isolation is characterized by a "lack of contact or of sustained interaction with the individuals and institutions that represent mainstream society" (Wilson, 1987:60). Being cut off socially and residentially from the mainstream society, individuals are deprived of exposure to role models and denied access to opportunities, which leads to economic marginalization, further exacerbating their social isolation (Whyte and Parish, 1984; Fernandez and Harris, 1992). If people feel that they are blocked off from access to opportunities through "diligent effort and orderly behavior," they are unlikely to conform to social norms (Whyte and Parish, 1984:234). This in turn may lead to socially deviant and HIV risk behaviors in an effort to release the frustration and anxieties associated with economic marginalization and social isolation.

Although not all are alike, many rural-urban temporary migrants in China are socially, culturally, and residentially isolated from Amainstream@ society in the place in which they live and work. Once arrived in the city, most temporary migrants live with fellow migrants at their place of work, such as construction sites, restaurants, and living quarters provided on-site by employers, or concentrate in the city's fringe areas and/or migrant villages characterized by poverty, overcrowding, social disintegration, and lack of law enforcement and social and health services (Ma and Xiang, 1998; Zhang, 2001). Such a living environment is not only conducive to deviant behaviors, but it is also a place where socially proscribed and HIV risk behaviors, such as drugs and prostitution, are more acceptable or tolerated. Few migrants will have neighbors, friends, or co-workers who are local native residents; their social interaction in the city does not go beyond that with their fellow villagers or fellow migrants. Consequently, many rural-urban temporary migrants experience little social or cultural assimilation in the city, feel helpless, insecure, discontented, and resentful, and are prone to deviant and risk-taking behaviors (Situ and Liu, 1996; Solinger, 1999; Anderson et al., 2003;).

In addition, the selectivity of temporary migrants in terms of social and demographic characteristics may lead to differentials in prevalence of HIV risk behaviors. There is ample evidence that rural-urban temporary migrants in China are predominantly single males in their late teens through early 30s (Goldstein, Goldstein and Guo, 1991; Wang, Zuo and Ruan, 2002; Fan, 2003; Liang and Ma, 2004). To the extent that males generally exhibit greater tendencies toward risk-taking than females, and young and single adults are more adventurous than older and married people, the sex, age, and marital status selectivity of temporary migrants would suggest that they are more likely to have unprotected casual sex with multiple partners and/or be drug users than non-migrant residents.

Therefore, post-migration lax social control and social isolation are hypothesized to be the main mediating mechanisms between temporary migration and HIV risk sexual and drug using behaviors. Together with migration selectivity, they may contribute to migrants' elevated HIV risk behaviors. Using a unique data set that is representative of both migrants and non-migrants, we will compare migrants directly with non-migrants and empirically test these hypotheses. The results will help shed light on whether and through what mechanisms temporary migrants are indeed more prone to drugs and unprotected casual sex and consequently truly the culprit in the fast spread of HIV/STDs in China.

Data and Methods

Data used in the analysis are from a large and population-based survey conducted in 2003 and covering an entire province in southwestern China. Sample selection followed a three-stage stratified sampling procedure. First, eight counties were selected, considering HIV and drug use prevalence and geographic representation of the province. Second, all rural townships and urban neighborhoods in the selected eight counties were ranked according to estimates of HIV prevalence, number of drug users, and number of temporary migrants. From the ranked list in each county, five townships and neighborhoods were selected, giving priority to places with higher concentration of HIV, drug users, and temporary migrants and geographic representation of the county. This resulted in a total of 40 townships and neighborhoods as the primary sampling units (PSUs).

Finally, in each PSU, all individuals between the ages of 18 and 55 were arrayed in order in one of four categories: HIV positive, drug users, temporary migrants, and non-migrants. A random sample of about 150 individuals was selected via disproportionate probability sampling (Kalton, 1993; Bilsborrow et al., 1997) and distributed as follows: 20 HIV positive, 30 drug users, 40 temporary migrants, and 60 non-migrants. In each category, sample selection started with randomly picking a person from the list and continued selecting individuals at fixed intervals determined by the ratio between the total on the list and the target number for the category. If a list contains 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, 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 from the original sampling list containing the absent or refused respondent unless there was no one left on the list. In total, 5,499 individuals, including 117 from the pilot testing town, were successfully recruited, who consented to participate and completed a face-to-face interview, which took place in private at respondents= home or a place away from home.

Version 7 of the STATA software is used to conduct statistical analyses, which are divided into two parts; all analyses use survey design-based “svy” methods in STATA to adjust for population weights and PSU design effects. The first part of the analysis focuses on direct comparisons between temporary migrants and non-migrants in prevalence of outcome (dependent) variables, which are self-reports of HIV/STD risk drug using (drug use, injection drug use, and needle sharing while injecting) and sexual behaviors (casual sex with non stable partners, unprotected casual sex, number of life time casual sexual partners, ever involved in commercial sex, and taking drugs/alcohol during sex) and diagnosis of HIV/STDs. Temporary migrants are defined as respondents who: (1) did not have the official household/residence registration in the place they were interviewed and (2) had traveled at least once away from home for a week or longer without the company of family in the five years prior to the survey.

Respondents who did not meet either condition are classified as non-migrant residents in the analysis. Chi-squared test of difference in proportions and *t*-test of difference in means are used to test if temporary migrants differ from non-migrants in the outcome variables.

In the second part of the analysis, we test if and to what extent social control, social isolation, and migration selectivity help to explain temporary migrants' vulnerability to HIV risk behaviors. Logistic regression is used to examine the impact of being a temporary migrant on the odds of unprotected casual sex and needle sharing while injecting in the 30 days prior to the survey; coefficient estimates for temporary migrant status between models with or without the control of measures of social control, social isolation, and migration selectivity are compared to determine their mediating impact between temporary migration and migrants' HIV/STD risk behaviors.

Social control is measured by a modified version of the Attitudes toward Authority Scale (Emler, 1999). Study 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 were then summed to create a "normlessness" scale. The higher the scale, the more likely the respondent had behaved in disrespect for laws or deviant ways. Cronbach's alpha for the scale is 0.71, indicating good reliability. The normlessness scale is further augmented by a dichotomous variable indicating whether the respondent was living alone at the time of the survey. Living alone is expected to be associated with greater anonymity and lax social control.

Social isolation is measured by a modified version of the UCLA Loneliness Scale (Russell and Cutrona, 1988), the Center for Epidemiologic Studies Depression Scale (Radloff, 1977), and an economic marginalization index. For the loneliness scale, respondents reported on a four-point scale how lonely they felt on each of 20 statements, while the depression scale is 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 were summed to form a "loneliness" scale and a "depression" scale, respectively. The economic marginalization index was constructed by first dichotomizing answers to 15 questions on employment, industry, occupation, income, perceived working

conditions, and employment-related benefits and then summing the 0/1 answers. For all three, the higher the scale/index values, the more lonely, depressed, or economically marginalized the respondent. Cronbach's alphas for the three scales are 0.80, 0.84, and 0.86, respectively, all indicating high reliability.

Finally, migration selectivity is measured by age, sex, educational attainment, marital status, and ethnicity differentials between temporary migrants and non-migrants. These are the common individual characteristics, on which temporary migrants are selected and which are also associated with HIV risk sexual and drug using behaviors.

Results

Table 1 presents study participants' profiles by temporary migrant status. Compared to non-migrants, temporary migrants scored significantly higher on measures of social control. But temporary migrants did not seem to differ significantly from non-migrants in measures of social isolation. Further, different from the common perception, temporary migrants scored significantly lower on the economic marginalization index (9.2 for migrants vs. 10.2 for non-migrants), indicating that on average they are economically less marginalized than non-migrants. In terms of individual demographic characteristics, migrants were significantly younger with more males and single persons than non-migrants. Temporary migrants also had significantly fewer ethnic minorities than non-migrants. With 29.4% having received a senior high school or higher education, temporary migrants were on average significantly more educated than their non-migrant counterparts.

(Table 1 about here)

Do temporary migrants differ from non-migrants in HIV risk drug using and sexual behaviors? Data in Table 2 clearly suggest that they do and temporary migrants had significantly higher prevalence rates than non-migrants in every measure of illicit drug use and casual sex. For example, temporary migrants were more than four times as likely as non-migrants (9.9 vs. 2.2) to have ever had unprotected casual sex; they were also more than six times as likely as non-migrants (7.9 vs. 1.3) to have had three or more casual sex partners during their lifetime. The difference in prevalence rates of drug use between

migrants and non-migrants was not as big, but temporary migrants were more than twice as likely as non-migrants (3.2 vs. 1.4) to have ever used illicit drugs in their lifetime.

(Table 2 about here)

Similarly, temporary migrants had significantly higher prevalence rates of HIV/STD risk behaviors in the 30 days prior to the survey. On average, temporary migrants were more than twice as likely as non-migrants to have had unprotected casual sex (3.1 vs. 1.5) and to have used drugs (1.6 vs. 0.6) during the month preceding the survey. Migrants were also more than twice as likely as non-migrants (14.9 vs. 6.8) to have taken drugs or alcohol during sex. The difference in prevalence rates of injection drug use and needle sharing while injecting between migrants and non-migrants in the 30 days prior to the survey were even more pronounced.

Clearly, both the lifetime and the 30-day measures suggested that temporary migrants were at significantly higher risk of acquiring HIV/STDs. However, the prevalence rates of self-reported history of STDs or HIV showed no statistical significance between temporary migrants and non-migrants even though the rates were much higher for migrants than for non-migrants (in the case of HIV, it was actually twice as high for migrants).

For a deeper understanding of what may have caused migrants' higher prevalence rates of HIV risk behaviors, we now turn to logistic regression, which will focus on the odds of having unprotected casual sex and needle sharing while injecting drugs in the 30 days prior to the survey. With no control for other variables (Model 1), migrants were significantly more likely than non-migrants (OR=2.17) to have had unprotected casual sex in the month prior to the survey. However, when measures of social control were entered in Model 2, the difference between migrant and non-migrant was no longer statistically significant, and the normlessness scale itself predicted significantly the odds of unprotected casual sex. The results suggest that the observed migrant and non-migrant differentials in unprotected casual sex may be attributable to migrants' having experienced more lax social control in their behavior, as hypothesized.

(Table 3 about here)

The control of measures of social isolation in Model 3 made no difference; migrants were still

more than twice (OR=2.24) as likely as comparable non-migrants to have had unprotected casual sex. Similarly, when differences in individual socio-demographic characteristics were accounted for in Model 4, the migrant and non-migrant differentials were reduced (OR=1.86) but remained statistically significant. Among the individual characteristics, only gender predicted significantly one's risky sexual behavior. Compared to otherwise comparable females, males are more than twice as likely (OR=2.23) to have had unprotected casual sex in the 30 days prior to the survey.

For the odds of needle sharing while injecting drugs in the month prior to the survey, data in Table 4 show large and significant differences between migrants and non-migrants. When only migrant status was examined in Model 1, temporary migrants were more than five times (OR=5.15) as likely as non-migrants to have shared needles. The migrant and non-migrant difference was more than halved (OR=2.30) when measures of social control were controlled for in Model 2. Further, the difference was no longer statistically significant. The normlessness scale itself was a significant and powerful predictor, more than doubling the odds (OR=2.57) of needle sharing for every unit increase in the scale. The results suggest that, just as with risky sexual behavior, migrants' much-elevated odds of needle sharing were mainly attributable to their experience of lax social control in behavior.

(Table 4 about here)

The control of measures of social isolation in Model 3 did not make much difference; temporary migrants continued to be more than five times (OR=5.46) as likely as non-migrants to have shared needles. Two of the three scales were, however, significant predictors themselves. As expected, study participants who were more depressed and/or economically marginalized were significantly more likely to have shared needles while injecting drugs. Finally, the control of socio-demographic characteristics in Model 4 reduced the migrant and non-migrant difference, but temporary migrants remained to be more than four times (OR=4.13) as likely as non-migrants to have shared needles in the month prior to the survey. Among the five individual characteristics, gender, education, and ethnicity were all significant and powerful predictors of needle sharing. Other things being equal, males were more than five times as likely as females to have shared needles, while being Han majority and having received a senior high

school or more education reduced the odds of needle sharing by 66% and 61%, respectively.

Discussion and Conclusions

Despite allegations made by the media and in the literature against migrants in the spread of HIV/STDs in China, few studies have compared migrants directly with non-migrants in prevalence of risk behaviors and HIV/STDs. Even fewer have tried to look beyond migration as a vector in HIV transmission and to understand mechanisms by which the process of migration may render migrants vulnerable to HIV/STD risk sexual and drug using behaviors. Using data from a population-based survey and employing statistical techniques that correct for sample weights and survey design effects, we were able to compare migrants directly with non-migrants and examine important factors that may mediate between migration and migrants' heightened HIV sexual and drug using behaviors.

The results clearly suggest that temporary migrants in China had significantly higher prevalence rates of both risky sexual and drug using behaviors than non-migrants. This is true for both the lifetime and the 30-day measures of a number of sexual and drug using behaviors. We examined three mechanisms, namely, migration selectivity, lax social control, and social isolation, by which the process of migration may explain migrant and non-migrant differentials in prevalence of HIV risk sexual and drug using behaviors. Of the three hypothesized mechanisms, post-migration lax social control, which may result from migrants' detachment from family and home community, was the most significant mediating factor that helped to explain migrants' heightened HIV risk behaviors. In other words, the observed migrant and non-migrant differentials in unprotected casual sex and needle sharing were mainly attributable to differences in the extent of social control over individual behavior experienced by migrants and non-migrants. Once measures of social control were controlled for, migrant and non-migrant differentials in risk behaviors were significantly reduced and ceased to be statistically significant.

In addition, migration selectivity had also contributed to differences in risk behavior between migrants and non-migrants. The predominance of males among temporary migrants was a particularly significant and powerful contributing factor as males were significantly more likely than comparable females to have unprotected casual sex (more than twice as likely) and shared needles while injecting

drugs (more than five times as likely). Further, for the odds of needle sharing, the results confirm that being ethnic minority and less educated were significant risk factors of needle sharing, which is consistent with evidence reported by the Chinese media and other studies.

However, the results failed to support post-migration social isolation as a potential mediating mechanism between migration and migrants' risk behaviors. At the bivariate level, temporary migrants did not differ significantly from non-migrants in measures of depression and/or loneliness; they were actually less marginalized economically than non-migrants. Both the depression and the economic marginalization scales, however, predicted significantly the odds of needle sharing, while the depression scale also predicted significantly the odds of having unprotected casual sex.

While the significantly higher prevalence of HIV risk sexual and drug using behaviors among temporary migrants put migrants at greater risks of HIV and STDs, the data did not show statistically significant difference in prevalence rates of HIV/STDs between temporary migrants and non-migrants. It is unclear whether self-reports may have underreported STDs and whether temporary migrants' generally more limited access to health services, including HIV testing, may have under-diagnosed STDs and HIV more among migrants than non-migrants. Further research, particularly research that includes STD and HIV testing, is needed to test migrant and non-migrant differentials in prevalence of HIV and STDs.

However, the evidence presented in the paper makes it evident that temporary migrants are at high risk of acquiring or transmitting HIV/STDs. As some researchers (Anderson et al., 2003) have cautioned, the growing migrant population in China may be the "tipping point" in China's battle with the AIDS epidemic. More studies are urgently needed to understand the dynamic relationship between migration and HIV risk sexual and drug using behaviors so that effective prevention intervention programs can be developed. As the evidence presented in this paper strongly suggests, post-migration lax social control as a result of migrants' detachment from family and home community should receive particular attention in intervention programs targeting temporary migrants.

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Table 1. Population Weighted Means of Measures of Social Control, Social Isolation, and Demographic Characteristics by Migrant Status.

Means of Individual Measures	Temporary Migrants	Non-migrant Residents	Total Sample
Social Control:			
Social control scale (mean)	0.6**	0.3	0.4
Live alone (%)	6.5**	1.5	3.5
Social Isolation:			
Depression scale (mean)	33.2	33.1	33.1
Loneliness scale (mean)	37.0	37.3	37.2
Economic marginalization scale (mean)	9.2**	10.2	9.8
Migration Selectivity:			
Age (mean)	31.0**	33.6	32.6
Male (%)	61.7**	44.5	51.4
Married (%)	72.6**	87.7	81.6
Senior high school or more education (%)	29.4**	18.2	22.7
Han majority (%)	72.4*	64.9	67.9
Unweighted sample size	3200	2299	5499

Note: Significance tests are between temporary migrants and non-migrant residents and are based on survey design-based (adjusted for population weights and PSU effects) *F* test, using "svytab" and "svymean"/"svytest" commands in STATA software for categorical and continuous variables, respectively.

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

Table 2. Population Weighted Prevalence Rates of Sexual and Drug Using Behaviors and HIV/STDs by Migrant Status (%)

Risky Behaviors and HIV/STDs	Unweighted Sample Size	Temporary Migrants	Non-migrant Residents	Total Population
Lifetime Measures:				
Ever had casual sex	5,498	17.5**	5.6	10.4
Ever had unprotected casual sex	5,389	9.9**	2.2	5.3
Ever buying or selling sex	4,759	6.4**	0.6	2.9
Three or more casual sex partners	5,280	7.9**	1.3	3.9
Ever used drugs	5,386	3.2**	1.4	2.1
30 Day (Prior to Survey) Measures:				
Had casual sex	5,326	6.6**	2.5	4.1
Had unprotected casual sex	5,327	3.1*	1.5	2.1
Took drugs/alcohols during sex	4,455	14.9**	6.8	9.9
Had used drugs	5,367	1.6**	0.6	1.0
Had injected drugs	5,367	1.0**	0.3	0.6
Shared needles while injecting	5,367	0.4**	<0.1	0.2
HIV/STDs:				
Ever had STDs	5,499	8.7	7.7	8.1
HIV positive	5,499	0.2	0.1	<0.2

Note: Significance tests are population-weighted and survey design-based *F* tests of differences between temporary migrants and non-migrant residents and are based on survey design-based (adjusted for population weights and PSU effects) *F* test, using "svytab" commands in STATA.

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

Table 3. Logistic Regression Analysis of the Odds of Having Unprotected Casual Sex in the 30 Days Prior to the Survey

Independent Variables (reference category)	Models			
	1	2	3	4
Migrant Status:				
Temporary migrants (non-migrants)	2.17*	1.92	2.24*	1.86*
Measures of Social Control:				
Normlessness scale		1.40*		
Living alone (with others)		0.99		
Measures of Social Isolation:				
Depression scale			1.10**	
Loneliness scale			1.00	
Economic marginalization scale			1.03	
Measures of Migration Selectivity:				
Age				0.99
Male (female)				2.23**
Married (not married)				0.77
Senior high school or more education (less than senior high school)				0.73
Han majority (non-Han minorities)				2.19
Sample Size (unweighted)	5,327	5,327	5,327	5,247
Model *F*	5.64*	3.51*	12.12**	3.57**

Note: Results are adjusted for population weights and PSU design effects.

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

Table 4. Logistic Regression Analysis of the Odds of Sharing Needles while Injecting Drugs in the 30 Days Prior to the Survey

Independent Variables (reference category)	Models			
	1	2	3	4
Migrant Status:				
Temporary migrants (non-migrants)	5.15**	2.30	5.46**	4.13*
Measures of Social Control:				
Normlessness scale		2.57**		
Living alone (with others)		1.39		
Measures of Social Isolation:				
Depression scale			1.11**	
Loneliness scale			1.01	
Economic marginalization scale			1.17**	
Measures of Migration Selectivity:				
Age				1.00
Male (female)				5.59**
Married (not married)				0.17
Senior high school or more education (less than senior high school)				0.39*
Han majority (non-Han minorities)				0.34*
Sample Size (unweighted)	5,498	5,498	5,498	5,416
Model *F*	12.74**	28.66**	35.36**	59.29**

Note: Results are adjusted for population weights and PSU design effects.

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