Gender and HIV risk behavior among intravenous drug users in Sichuan Province, China

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Abstract

Using data from a community-based study of injection drug users (IDUs) in Sichuan Province in China, this study compared the level of HIV risk behavior (needle sharing and unsafe sex) amongst female and male IDUs, and examined the risk factors separately for these two groups. Five risk factors were examined in the analysis, including a lack of family support, having an IDU primary sex partner, economic pressure, lack of access to a methadone program, and younger age. Regression results showed that male and female IDUs had different risk factors. For male IDUs, younger age and a lack of family support increased their level of HIV risk behavior. For female IDUs, having an IDU primary sex partner and economic pressure were predictive of their HIV risk behavior. Sex differences in risk factors are explained with respect to gender norms surrounding HIV risk behavior in the context of social relations. Female IDUs who were sex workers suffered additional HIV risk due to their powerlessness in negotiating safe sex with male customers. Practical implications of the findings for HIV/AIDS prevention and intervention work in China are discussed.

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Keywords: HIV/AIDS; Injection drug use; Gender; Risk behavior; China

Introduction

In 2003, China estimated that the number of people infected with HIV had reached 840,000, and the number of people living with AIDS was 80,000 (UNAIDS, 2004). Injection drug users (IDUs) who shared needles accounted for 68% of HIV cases in 2002 (Settle, 2003, p. 3). A study of four cities in central China found that IDUs constituted between 45% and 92% of all drug users (Cheng et al., 2003). The national sentinel system reported that the rates of needle sharing in Yunnan, Xinjiang, Guangxi, Hunan, Hubei, and Jiangxi provinces were all over 60% (Ministry of Health, 2000). High percentages of IDUs who shared needles were reported not only in provinces with high HIV prevalence rates among IDUs such as Yunnan, Xinjiang and Guangxi in the southwest, but also in provinces with lower HIV prevalence rates among IDUs such as the southern and coastal province of Guangdong (Lau, Feng, Lin, Wang, & Tsui, 2005).

Equally noteworthy is the fast increase of female IDUs who shared needles (Zhang & Wu, 2002). Some provinces reported that 40% of injectors are...
women (Phariss & Thompson, 2004). A study in Hubei Province found that 90% of female IDUs shared needles (Zhang & Wu, 2002). In a study conducted in Guizhou Province, nearly 30% of all drug users were women, and a considerable number of them had engaged in commercial sex (Li et al., 2000). Some 21% of female IDUs surveyed in Yunnan Province reported selling sex for money or drugs in the previous month (UNAIDS/WHO, 2004). Other studies in Yunnan Province found that the prevalence of HIV among female IDUs was significantly higher than that in male IDUs (Gao & Yang, 2000; Zhang & Ma, 2002).

A growing body of research has suggested that as one of the major axes around which social life is organized, gender has shaped the exposure of women and men to HIV risk behavior (Bruyn, 1992; Campbell, 1995, 2000; Dunkle et al., 2004; Gilbert & Walker, 2002; Gysels, Pool, & Nnalusiba, 2002; Heise & Elias, 1995; Karim, Karim, Soldan, & Zondi, 1995; McGrath et al., 1993; Setel, 1999; Ulin, 1992). Given the rapid increase in the number of women infected with HIV in China, as evidenced by the drop in male to female HIV infection ratio from nine to one in the early 1990s to three to one in 2001 (Settle, 2003), it is paramount to understand gender differences in risk behavior and its associated risk factors in combating the rapid spread of the HIV/AIDS epidemic in China. Using data from a community-based study of IDUs in a city in Sichuan Province in southeastern China, this study has three objectives: (1) to compare the levels of HIV risk behavior of female and male IDUs; (2) to examine the risk factors separately for these two groups, and (3) to discuss the implications of the findings for prevention and intervention work.

Theoretical framework

There are two major sets of HIV-related risk behavior associated with IDUs, namely, needle sharing (in particular the borrowing of used and contaminated needles from another person) and unsafe sex. To find the risk factors for these two types of HIV risk behavior, we focus on a multiplicity of factors, involving social relations, economic pressure, access to methadone programs, and age.

First, the social relations of drug users, especially intimate ones, can become risk factors for, or protective factors against, high-risk drug use. Social relations may be seen as a source of “social capital,” referred to as resources that can be used by the actor to facilitate social action or achieve goals (Coleman, 1988; Woolcock & Narayan, 2000). Social capital can exist in many forms, ranging from obligations, expectations, trustworthiness, and information channels to social support and personal empowerment (Cheung, Mok, & Cheung, 2005; Sandefur & Laumann, 1998). In the case of a drug user, the network of social relations that he/she is embedded in may generate resources that either decrease or increase his/her risk level of drug use. Here, two criminological theories are relevant. Differential association theory explains a person’s involvement in deviant behavior by focusing on the learning of deviance from deviant persons with whom the person is intimately associated (Sutherland & Cressey, 1978). Social bonding theory holds that what restrains people from becoming deviant is the informal social control exerted by the social bonds between the individual and his/her significant others (Cheung, 1997; Hirschi, 1969; Rankin & Wells, 1990). Thus, if the intimate network of the drug user consists of non-drug-using people, such as family members and close friends, then the social capital that can be generated from the network will be in the forms of (i) opportunity for the drug user to learn a more “normal” way of life that avoids high-risk behavior such as injection drug use and unprotected sex, and (ii) informal social control restraining the drug user from engaging in high-risk drug use and sexual behavior (Cheung & Cheung, 2003). The social capital gained becomes a protective factor for HIV risk behavior.

Conversely, if the drug user’s network consists predominantly of drug-using peers, then the learning opportunity and informal social control will likely work in the opposite direction, reinforcing the continuous practice of high-risk drug use and sexual behavior (Cheung & Cheung, 2003), although some active drug users are capable of disseminating knowledge about protective measures that could minimize the risk of drug use amongst themselves (Friedman, Curtis, Neaigus, Jose, & Des Jarlais, 1999). Social capital in this case is “negative social capital” (Portes, 1998), increasing, rather than reducing, HIV risk behavior.

In this analysis, we choose “family support” and “having IDU as primary sex partner” as the two social relations variables. Family support is a protective factor against HIV risk behavior because the drug user benefits from the opportunity to learn to avoid high-risk behavior from family members,
as well as the informal social control exerted by them against such behavior. Contrarily, an IDU sex partner reinforces injection and needle sharing by providing the opportunity for and informal social control of continuous needle sharing practice, and hence is a risk factor for HIV risk behavior.

Studies elsewhere suggest that there is a marked gender difference with respect to the second social relation factor, having an IDU as primary sex partner. Compared with male IDUs, female IDUs are more likely to have regular sex partners who inject (Barnard, 1993; Davies, Dominy, Peters, & Richardson, 1996; Evans et al., 2003; Miller & Neaigus, 2001). Moreover, injection risk of female IDUs frequently occurs within the context of an intimate relationship involving regular sex partners (Gollub, Rey, Obadia, Moatti, & the Manif 2000 Study Group, 1998). In their study, MacRae and Aalto (2000) found that over three-quarters of drug-using women who had ever been in a sexual relationship with a male injector had been predominantly injected by their partner whilst in that relationship. On the other hand, injection risk of male IDUs is more likely to occur within peer activities, e.g. drinking alcohol together (Davies et al., 1996; Sherman, Latkin, & Gielen, 2001).

The third risk factor considered in this analysis is "economic pressure." As drug addiction is an expensive habit, many drug users unavoidably face tremendous pressure to find money to support the habit, eventually enslaved by the continuous involvement in criminal activities for money (Anglin & Speckart, 1988; Hser, Chou, & Anglin, 1990). In China, economic pressure is not only a risk factor for criminality, but also a risk factor for HIV risk behavior. Many drug users choose to inject because injection allows them to dilute the drug for each use, thereby becoming a cheaper method of using heroin than smoking or nasal methods. Also, the cost of needles, currently about one yuan (approx. US$0.12) each, is a burden because injectors inject more than once a day. Acute economic hardship usually precipitates HIV risk behaviors such as the re-use and sharing of needles. Living on the edge of craving and seeking immediate and urgent relief of their pain, poverty-stricken IDUs will likely pay little heed to safety injunctions.

Compared with their male counterparts, economic pressure exposes female IDUs in China to the additional risk of unsafe sex because a substantial number of them engage in commercial sex to support their drug taking. Nearly 60% of female IDUs in Sichuan Province reported selling sex for money or drugs, and less than 30% of them reported consistent condom use with customers (He et al., 2003). Male customers were unwilling to use condoms, citing reasons of discomfort and the lack of sensation. While sexual predation is a symbol of masculinity, sexual passiveness is regarded as feminine in China. This gender norm means that commercial sex workers, streetwalkers from rural backgrounds and with low educational levels in particular, have limited scope for negotiating safe sex. Thirty percent of streetwalkers surveyed in Sichuan province reported failed attempts to convince their clients to use condoms (China-UK, 2003). Sex work and low condom usage expose female IDUs to the risk of contracting sexually transmitted diseases, which heightens their vulnerability to HIV/AIDS.

The next factor, a protective one, is "access to a methadone program". China has recently adopted the methadone program for combating the spread of HIV among drug users. Widely practiced in many parts of the world, including Hong Kong, methadone programs are considered an effective harm-reduction strategy in the prevention of HIV/AIDS, as drug users stabilized on methadone could lead a more or less normal life and continue to be productive members of the community (Cheung, 2000; Cheung & Ch'ien, 1996; Erickson, Riley, Cheung, & O'Hare, 1997; Serpelloni & Carrieri, 1994; Wells Calsyn, Clark, Saxon, & Jackson, 1996). In November 2004, China announced that 1000 methadone clinics would be established within 5 years for the prevention of the spread of HIV/AIDS among drug addicts (China Daily, 2004). Before this formal announcement, eight clinics had already been opened in early 2004 in the southwestern provinces of Yunnan and Sichuan for trial operation.

Although the experimental methadone program in China is a voluntary treatment and maintenance program, its entry threshold is by no means low. First, it costs 10 yuan per visit, which is very expensive by China's average living standard. Second, access is denied to those who do not have a proper local household registration (hu kau). This second hurdle has disproportionately affected female IDUs who engage in commercial sex work. As they often migrate to other towns to conduct their business in order to avoid social stigmatization and criminalization in their home towns, they do not have local residency to qualify for a methadone program in the towns where they work and live.
Lastly, we investigated the influence of another socio-demographic variable in the analysis—age. Previous studies of the relationship between age and HIV/AIDS risk behavior have not yielded consistent findings. For example, in their study of 2000 gay men in 16 cities in the US, McAuliffe et al. (1999) found that a progressive decline in the levels of risk behavior such as unprotected anal intercourse was associated with increasing age. Another study of a national sample of 25106 out-of-treatment IDUs in the US, however, found that injection risk rose steadily along with age (Richard, Bell, & Montoya, 2000). In China, we hypothesize a negative relationship between age and HIV risk behavior. As IDUs age, their networks of drug-using buddies dwindle, because more and more of the buddies are either institutionalized in prisons, labor camps, and compulsory detoxification programs, or suffer pre-mature deaths due to long-term drug-related health problems. The lack of drug-using buddies, albeit a source of loneliness and despair, has the advantage of reducing the opportunity to engage in needle sharing.

In sum, we investigate the influence of two risk factors and three protective factors on HIV risk behavior. For convenience sake, the protective factors are expressed in terms of risk factors by reversing the directions of the variables. To recap, the five risk factors are: (1) lack of family support, (2) having an IDU as primary sex partner, (3) economic pressure, (4) lack of access to a methadone program, and (5) younger age. These risk factors are hypothesized to be positively related to HIV-related risk behavior. We will also explain the differences in risk factors between male and female IDUs with respect to gender norms surrounding HIV risk behavior in the context of social relations.

Method

Research site and data collection

Data for this research were collected in a medium-sized city (population 610,000) situated in the southwest of Sichuan Province, China, between May 2003 and December 2004. HIV infection among IDUs in Sichuan is growing at an exponential rate, with an average annual growth rate of 97.23% between 1991 and 2003. The province had 67,000 registered drug users and recorded 4333 cases of HIV infection in 2004. Over 95% of the infection was caused by the sharing of contaminated needles among IDUs, and around 5% was through sexual contacts (China-UK, 2002). Previous studies found that around 60% of IDUs in Sichuan province shared needles and syringes (Cheng et al., 2003; Chen, Jiang, & Ruan et al., 2004). Another study found that around one-third of IDUs shared needles, syringes and cotton in the past 3 months and these factors were in turn found to be significantly associated with HIV infection (Ruan et al., 2004).

The data collection process involved two phases. Phase I consisted of field observation, 14 in-depth interviews (five male drug users, seven female drug users who exchanged sex for money, and a government official), and six focus group sessions (two groups of sex workers, two groups of drug users of mixed sex, and two groups of outreach workers). All the observations, interviews and focus group sessions were conducted by the first author. Detailed field notes were prepared for each observation, and the interviews and focus groups were taped and fully transcribed in Chinese. These qualitative data were analyzed using NDUST (version 6).

Phase II involved a community-based questionnaire survey of IDUs. The sampling frame was a list of 970 individuals who had been contacted by the outreach and intervention programs of the City’s Center for Sexually Transmitted Diseases and Leprosy Control since 2001. Outreach workers of the intervention programs contacted all available individuals. Due to a high death rate (around 5% per annum), a high rate of incarceration in forced detoxification centers and labor camps, and out-migration amongst IDUs, only 202 individuals were available during the month when the survey was conducted, and 200 interviews were successfully completed. In the sample (N = 200), the sex distribution was 57% male and 43% female. The mean age was 31.28 years (SD = 5.78). The majority of respondents had lower secondary school education (53%). Twenty-five percent of the respondents were sex workers and all sex workers were women. Over half of the respondents (54%) were either married or had a primary partner.

Given the illegality of drug use and sex work in China, various measures were taken to ensure confidentiality, to protect the identity of respondents, and to minimize refusal. No recruitment was undertaken in compulsory detoxification centers, re-education centers, labor camps, or jails. Participation in the research was entirely voluntary with
informed consent. All interviews were conducted on a one-to-one basis in the privacy of consultation rooms at the City’s Center for Sexually Transmitted Diseases and Leprosy Control. If respondents could not commute to the Center, a team of two trained interviewers visited the respondents at places of their own choosing to conduct the interviews. Measures were taken to maximize privacy and confidentiality in these cases. All interviewers were outreach workers who attended a two-day training course run by the first author.

A major drawback of our sample is that it was not able to include IDUs who had not been contacted by the intervention projects of the City’s Center for Sexually Transmitted Diseases and Leprosy Control. Some of these IDUs might have been so marginalized that even outreach workers were not able to get in touch with them. Some might have been institutionalized during our study. Yet a small number of them might be from the upper echelon of society and would not want to expose their IDU status. Despite the limitation, the data, which had been professionally collected from the survey and ethnographic field work, constitute a useful and valuable data set for the present topic.

Variables

Ten questionnaire items were used to measure “HIV risk behavior” in the 12 months prior to the survey. There were three items on sexual risk (having multiple sexual partners, non-condom use with main sexual partner, and non-condom use with casual sexual partners); three items related to sexually transmitted diseases (self-reported sexually transmitted diseases, having sex without using a condom when having sexually transmitted diseases, and not seeking treatment when having symptoms of sexually transmitted diseases); and four items on needle sharing (borrowing used needles of sex partner, friends, sharing injection equipment with another person, and using needles prepared by someone else). Each questionnaire item had four response categories ranging from “frequently” (scored 3), “sometimes” (scored 2), “hardly ever” (scored 1), and “never” (scored 0). The scores of these items were summed to form the scale of “level of HIV risk behavior.” The alpha value (Cronbach, 1951) of the scale was 0.68, indicating an acceptable level of reliability.

“Family support” was measured by four questionnaire items: whether their family members cared about them, accepted them, helped them when necessary, and visited them. Each of the items had four response categories: “frequently” (scored 3), “sometimes” (scored 2), “hardly ever” (scored 1), and “never” (scored 0). Scores of these items were summed to form the family support scale. The alpha value of the scale was 0.87.

“Having an IDU as primary sex partner” was indicated by a questionnaire item that asked whether the respondent’s primary sex partner had injected drugs in the last 12 months. The question had four response categories: “frequently” (scored 3), “sometimes” (scored 2), “hardly ever” (scored 1), and “never” (scored 0).

“Economic pressure” was indicated by four questionnaire items that measured the respondents’ sense of economic pressure: experiencing a lot of economic pressure; only thinking about how to earn money; doing things that they are reluctant to do in order to get some money; and putting aside self-esteem in order to find some money. All four items had four response categories: “frequently” (scored 3), “sometimes” (scored 2), “hardly ever” (scored 1), and “never” (scored 0). Scores of the four items were aggregated to form the economic pressure scale, which had an alpha value of 0.76.

“Access to a methadone program” was indicated by a questionnaire item which asked whether the respondent had been taking any methadone prescribed by the City’s Center for Sexually Transmitted Diseases and Leprosy Control: over 60% of our respondents were on the city’s government sponsored methadone maintenance program.

As mentioned earlier, age was also introduced as a predictor variable in the analysis.

Results

Table 1 reports the distributions of HIV risk behavior and risk factors in the total sample, and the male and female sub-samples.

Male and female IDUs in our sample were significantly different in age, in having an IDU as primary sex partner, and in their access to a methadone program. Compared with male IDUs, female IDUs were significantly younger, more likely to have an IDU as a primary sex partner, and less likely to be enrolled in a methadone program. Male and female IDUs were not significantly different in the amounts of family support they had and economic pressure they experienced.
Compared with their male counterparts, female IDUs were at a greater risk of HIV/AIDS, as shown by their significantly higher mean score of HIV risk level (5.89 as compared to 3.61 among male IDUs). There were also gender differences in types of HIV risk behavior. Compared with male IDUs, female IDUs in our sample were significantly more likely to have multiple sex partners, to have sexually transmitted diseases, and to have not treated sexually transmitted diseases. Male IDUs, on the other hand, were significantly more likely than female IDUs to have used a needle prepared by someone else. In line with studies in other countries, female IDUs in our sample were more likely to borrow used needles from a sex partner compared with male IDUs (13.1% vs. 8.6%). Male IDUs were more likely to borrow used needles from friends than female IDUs (17.2% vs. 13.1%). Yet these two differences were not statistically significant.

Table 2 reports the results of OLS regression of level of HIV risk behavior for the total sample. The predictor variables were progressively entered, yielding six models. We included the variable “sex” in the list of predictor variables as we would like to find out if there had been spuriousness in the relationship between sex and HIV risk behavior. Model A shows the bivariate correlation between sex and the level of HIV risk behavior, suggesting that female IDUs exhibited a significantly higher level of HIV risk behavior than male IDUs. In Model B, in which age was added, sex was still significantly related to HIV risk behavior, whereas age was significantly and negatively related to HIV risk behavior. “Having an IDU as primary sex partner” was then added to the equation (Model C), and all the three predictor variables were still significant, although the impact of sex has substantially been reduced. In Model D, access to a methadone program was introduced. Sex became insignificant, while age, having an IDU sex partner and access to a methadone program were all significant. Family support was the next added variable (Model E). All predictor variables were significant, except sex. Lastly, after economic pressure was added in Model F, access to a methadone program like sex, was a variable that became insignificant.

Among the six models, Model F explains the largest amount of variance of level of HIV risk behavior ($R^2 = 0.274$), and is therefore selected as the best model. The model confirms that younger age, having an IDU sex partner, lack of family support, and economic pressure were risk factors for HIV risk behavior. It also shows that the

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Overall</th>
<th>Men</th>
<th>Women</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>31.28 (5.77)</td>
<td>32.91 (5.96)</td>
<td>29.02 (4.66)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Having IDU primary sex partner</td>
<td>33 (16.5%)</td>
<td>12 (10.3%)</td>
<td>21 (25%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Access to methadone program</td>
<td>123 (61.5%)</td>
<td>82 (70.7%)</td>
<td>41 (48.8%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mean score of family support</td>
<td>9.62 (3.07)</td>
<td>9.85 (3.03)</td>
<td>9.31 (3.13)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Mean score of economic pressure</td>
<td>6.99 (3.18)</td>
<td>6.71 (3.16)</td>
<td>7.37 (3.18)</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Table 1
Demographic characteristics, risk factors, and HIV risk behavior of male and female intravenous drug users in the study (N = 200)

<table>
<thead>
<tr>
<th>N (%)</th>
<th>Overall (100%)</th>
<th>Men (%)</th>
<th>Women (%)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200 (100%)</td>
<td>116 (%)</td>
<td>84 (21%)</td>
<td></td>
</tr>
<tr>
<td>Predictor variables</td>
<td></td>
<td></td>
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<td>7.37 (3.18)</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Outcome variable: HIV risk behavior in last 12 months

<table>
<thead>
<tr>
<th></th>
<th>Overall (%)</th>
<th>Men (%)</th>
<th>Women (%)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having multiple sex partner</td>
<td>85 (42.5%)</td>
<td>28 (24.1%)</td>
<td>57 (67.9%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Unprotected sex with primary partner</td>
<td>101 (50.5%)</td>
<td>56 (48.3%)</td>
<td>45 (53.6%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Unprotected sex with casual partner</td>
<td>52 (26.0%)</td>
<td>24 (20.7%)</td>
<td>28 (33.3%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sexually transmitted diseases (STD)</td>
<td>54 (27.0%)</td>
<td>19 (16.4%)</td>
<td>35 (41.7%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Having sex when having STD</td>
<td>19 (9.5%)</td>
<td>11 (9.5%)</td>
<td>8 (9.5%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>No treatment for STD</td>
<td>49 (24.5%)</td>
<td>22 (19.0%)</td>
<td>27 (32.1%)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Used needles of sex partner</td>
<td>21 (10.5%)</td>
<td>10 (8.6%)</td>
<td>11 (13.1%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used needles of friends</td>
<td>31 (15.5%)</td>
<td>20 (17.2%)</td>
<td>11 (13.1%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Shared injection equipment (e.g. rinse water, cotton with other)</td>
<td>47 (23.5%)</td>
<td>27 (22.3%)</td>
<td>20 (23.8%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used needles prepared by other</td>
<td>22 (11.0%)</td>
<td>17 (14.7%)</td>
<td>5 (6.0%)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Mean score of HIV risk level</td>
<td>4.58 (4.39)</td>
<td>3.61 (4.30)</td>
<td>5.89 (4.18)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

n.s. = not significant.
For means, standard deviation in parentheses.
previous correlation between sex and HIV risk behavior and that between access to methadone programs and HIV risk behavior were largely spurious. This suggests that it was not being female per se that accounted for the higher level of HIV risk behavior of women. It could have been due to gender differences in social conditions such as age, having an IDU sex partner and access to methadone programs, as reported in Table 1. It could also have been due to the differential effects of the significant risk factors (Model F) on HIV risk behavior in the male group and the female group. To further elaborate on the possible role of gender norms in HIV risk behavior between the two groups, we next examined the relationships between these risk factors and level of HIV risk behavior in the male IDU sub-sample and the female IDU sub-sample separately. To highlight the gender differences in risk factors, only significant ($p<0.05$) risk factors were reported (Table 3).

Our results show that the male and female sub-samples had different risk factors. The two factors that were significant for the male sub-sample were not significant for the female sub-sample, and those that were significant for the female sub-sample were not significant for the male sub-sample. For the male sub-sample, only two factors were significantly associated with HIV risk level. Both age ($\beta = -0.362; \ p < 0.001$) and family support ($\beta = -0.313; \ p < 0.001$) had a relatively high protective effect against HIV risk behavior among male IDUs. For the female sub-sample, however, only having an IDU sex partner ($\beta = 0.309; \ p < 0.01$) and economic pressure ($\beta = 0.390; \ p < 0.001$) were significant risk factors.

**Discussion**

To recapitulate, our data showed that female IDUs were exposed to a higher level of HIV risk behavior compared with male IDUs. It also suggested that the difference in the level of HIV risk behavior between male and female IDUs might be largely spurious, mediated by gender norm differences in the effects of age, family support, injection of primary sex partner and economic pressure on HIV risk behavior for male and female IDUs. Separate analyses for male and female IDUs further suggested that these two groups had different sets of risk factors. The recognition of gender differences in HIV-related risk behavior and risk factors, as found in this study, is important for the formulation of prevention and intervention strategies that could discriminate between the risk factors amongst male and female IDUs rather than treat target IDUs as an homogenous group. In this section, we will interpret differences between male and female IDUs in risk factors with respect to gender norms and the double jeopardy facing female IDUs. Ethnographic data collected by the first author in the field will be employed to substantiate the discussion.

**Gender norms and HIV risk behavior**

HIV risk behavior such as needle sharing and unsafe sex takes place in the context of interaction with people with whom the IDU has established social relations. At this juncture, gender norms impact on relationship dynamics that shape the risk behavior of male and female IDUs.
For men, injection and needle sharing are social activities that occur mainly in a peer group context, in which masculinity is displayed. The willingness to share needles despite the awareness of its potential risk of HIV transmission vindicates fearlessness, generosity, loyalty and solidarity toward peers. The link between drug use and peer group association has been ascertained in Western studies (Bourgois, 2003; Davies et al., 1996). In China, the study by Li & associates has also found that the symbolic meaning of drug use is a means of gaining peer acceptance through the display of masculinity (Li et al., 2000). Our ethnographic information also echoes this gender norm pertaining to male drug users. The following quotation by a male drug user illuminates the rhetoric of friendship and male solidarity among male drug users in the context of needle sharing:

Respondent: “I haven’t borrowed used needles from anybody. But I have lent my needles to friends. If your friends don’t have money, how could you reject their request to borrow your needle? We are friends. If he is craving, his needle is blocked, or he drops his needle to the floor and damages it, he will ask to borrow mine. I will lend my needle to him.”

Interviewer: “Will you reuse the needle after your friend returns it to you?”

Respondent: “may be not.”

Interviewer: “Are you afraid of AIDS?”

Respondent: “No, I am not afraid. Why should I be afraid...If I lend him my needle, we are friends. Just wash the needle, use a little bit of water, it will be fine.”

Unlike men, needle sharing is a much more private matter for women, confined mostly within very intimate networks, such as with the main sex partner. Moreover, studies in the West have found that when men share needles with their female sex partner, they are more likely to pass on used equipment than vice versa (Bennett, Velleman, Barter, & Bradbury, 2000; Evans et al., 2003). This may explain why “having an IDU as primary sex partner” is not a significant risk factor for male IDUs in our sample as we focused mainly on the risk of borrowing rather than lending in this paper. On the other hand, when women share needles with their male sex partner, they are more likely to receive previously used injecting equipment than vice versa (Bennett, Velleman, Barter, & Bradbury, 2000; Evans et al., 2003). In other words, women who share needles with their intimate sex partner are exposed to a higher HIV risk than their male counterparts because they are at the receiving end of viruses located on used injection equipment. A similar pattern of sharing between intimate sex partners has also been observed among IDUs in our

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Table 3

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Dependent variable: Level of HIV risk behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total sample</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Age</td>
<td>–0.277</td>
</tr>
<tr>
<td>Having IDU primary sex partner</td>
<td>0.209</td>
</tr>
<tr>
<td>Family support</td>
<td>–0.168</td>
</tr>
<tr>
<td>Economic pressure</td>
<td>0.232</td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
</tr>
<tr>
<td>Multiple R</td>
<td>0.504</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.254</td>
</tr>
<tr>
<td>$F$ (df)</td>
<td>16.36(4)***</td>
</tr>
</tbody>
</table>

* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

“Methadone maintenance was not included in the models because in Model F (Table 2) its relationship with HIV risk level was not significant.
field site, as illuminated by the following quotation from a woman who routinely shares needles with her husband:

What will happen to us? We have been together for such a long time, what disease will we get from each other? We take the medicine (use drug) together when we get money… he will inject first and then I will inject.

For this woman, needle sharing was an expression of trust and mutual support. She took it for granted that her husband should have injected first and then passed her the used needle each time when they administrated the drug, which, as it turned out, was mainly purchased with the money that she earned through sex work. This pattern of gendered drug administration bears resemblance to norms guiding the distribution of food between spouses in Chinese families. Wives are expected to serve food to their husbands first and then eat whatever is left over. This gender norm reflects male dominance because being the head and supposedly the provider of the family, the good health and good nutrition of men is given a higher priority than that of women. This norm also expresses the virtue of self-sacrificing, which is regarded as an important attribute of good wifehood in China (Stockard, 1989).

Age, family support and HIV risk behavior of male IDUs

If, as an expression of masculinity, male IDUs tend to share needles with their friends, then the vicissitudes of their IDU peer networks would affect the amount of needle sharing behavior.

In China, formal surveillance by strict law enforcement, and informal surveillance through neighborhoods, workplace and other informal units in the community, together form a highly repressive and punitive system of control of illicit drug users that constitutes an obstacle to the formation of stable drug networks. High rates of incarceration in forced detoxification camps, labor camps, and jails result in a very high turnover of IDU networks in the field site. The loosening of migration control since the 1980s further increases the transient nature of such networks as IDUs come and go. Together with these structural forces, the deteriorating health of IDUs and the high rate of pre-mature deaths among them also contribute to the gradual disintegration of IDU peer groups. Consequently, as a male IDU gets older, his IDU network also weakens or even dissolves, resulting in the reduction of available peer activities for the display of masculinity through needle sharing. We think the dwindling of IDU networks during the course of life probably explains why age is negatively related to HIV risk behavior among male IDUs.

The weak and transient nature of the IDU peer network in the field site also has a bearing on the importance of family support for male drug users. Since the drug user network is vulnerable, it is not a reliable source of security, support nor help for its members. Amid the rhetoric of male solidarity sometimes claimed by male IDUs when talking about the context of needle sharing, IDUs also reckoned that they could not really trust their IDU peers nor count on them for help. As two members of a focus group session said:

Respondent A: there is no real friendship among drug users.
Respondent B: Everything is very superficial (biaomian).

Against this background, the families of male IDUs have a role to play in deterring their needle sharing activities. As discussed earlier, the family can provide an opportunity for the male drug user to learn to stay away from risk behavior and the informal social control that restrains such behavior, as delineated by the social capital perspective. Moreover, material help of the family can ease the economic pressure faced by the male drug user, thereby reducing the need for him to engage in injection and needle sharing as a cost saving alternative during serious economic hardship. Thus, among male IDUs in our study, greater family support was predictive of a lower level of HIV risk behavior.

Sex work and double jeopardy of female IDUs

Both male and female IDUs are faced with serious economic hardship due to heavy drug use. Theoretically, economic difficulties could be eased in a number of ways, such as getting material help from the family, finding a better paid job, and quitting drug use. For many, however, these are not real options, as financial help of family members would not be permanent, unemployment is the norm among heavy drug users, and long-term abstinence is extremely difficult to achieve. On this note, female IDUs who are determined to find a way out of the impasse of economic hardship do have an
option that is not widely available to male IDUs. The option is to be a sex worker. Previous studies showed that the majority of sex workers in the field site and other areas in Sichuan Province are women (China-UK, 2002; He et al., 2003). In our study, 47 of the 82 female IDU subjects (57%) were sex workers (Table 4).

As Table 4 shows, women who were sex workers exhibited a significantly higher level of HIV risk behavior than those in the non-sex worker group. As expected, sex workers were significantly more likely to have multiple sex partners and unprotected sex with casual partners than non-sex workers. Before engaging in sex work, the HIV risk of a female IDU mainly comes from her intimate sex partner. Once she becomes a sex worker in another town, she opens up another avenue of HIV risk through unsafe sex, thereby throwing herself into a double jeopardy.

A study in Panzhihua City, which is adjacent to the field site, found that nearly half of the mine workers surveyed had sex with sex workers in the last 3 months. Among them, only 7% had used a condom in the last sexual transaction (China-UK, 2003). While most male customers, especially those with low education and from a rural background, are unwilling to use a condom, sex workers who are in contact with the intervention programs may deploy an array of strategies (e.g. checking of signs of STD by examining the penis of a customer, flirting, persuasion, and education) to negotiate safe sex. Yet the pain of craving resulted from the lack of resources to purchase drugs was cited by many female IDUs as a major factor that inhibited their propensity to be able to negotiate safe sex with customers, as elaborated by the following case:

He asked me my price. We were still bargainin-
g...He said he would give me fifty. He said he would not use a condom. I thought that maybe I could persuade him to use one after we arrived at the guest house. Yet he insisted on not using a condom. I didn’t have any money at that time. If I still didn’t get any money, I would definitely suffer the pain of craving.

The criminalization of sex work (and of their customers), based on the assumption that sex workers need to be rescued and reformed by the state (Hershatter, 1994), has further exacerbated the HIV risk of female IDUs who engage in sex work. Our informants complained that the policy of “getting tough” (yan da) and the waves of police raids on hair salons, massage parlors, and Karaoke bars had scared their customers away, forced many entertainment venues to close down,

Table 4
Comparison by sex work status among female IDUs (N = 82)

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Non-sex worker</th>
<th>Sex worker</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (standard deviation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.71 (4.81)</td>
<td>27.68 (4.22)</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Having IDU primary sex partner</td>
<td>10 (28.6%)</td>
<td>11 (23.4%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Mean score of family support</td>
<td>10.20 (2.52)</td>
<td>8.57 (3.41)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Access to methadone program</td>
<td>30 (88.2%)</td>
<td>10 (21.3%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean score of economic pressure</td>
<td>5.06 (2.59)</td>
<td>9.04 (2.49)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Outcome variable: HIV risk behavior in last 12 months

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>Non-sex worker</th>
<th>Sex worker</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having multiple sex partners</td>
<td>11 (31.4%)</td>
<td>44 (93.6%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unprotected sex with primary partner</td>
<td>22 (62.9%)</td>
<td>22 (46.8%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Unprotected sex with casual partner</td>
<td>5 (14.3%)</td>
<td>22 (46.8%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Sexually transmitted diseases (STD)</td>
<td>14 (40.0%)</td>
<td>21 (44.7%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Having sex when having STD</td>
<td>2 (5.7%)</td>
<td>6 (12.8%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>No treatment for STD</td>
<td>10 (28.6%)</td>
<td>17 (36.2%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used needles of sex partner</td>
<td>2 (5.7%)</td>
<td>9 (19.1%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used needles of friends</td>
<td>4 (11.4%)</td>
<td>7 (14.9%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Shared injection equipment (e.g. rinse water, cotton with other)</td>
<td>10 (28.6%)</td>
<td>10 (21.3%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used needles prepared by other</td>
<td>3 (8.6%)</td>
<td>2 (4.3%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Mean score of level of HIV risk behavior</td>
<td>4.29 (2.96)</td>
<td>7.17 (4.61)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

n.s. = not significant.

For means, standard deviation in parenthesis.
and seriously interrupted their livelihood. A street-walker lamented:

This half year the police got really tough ... They are patrolling everyday in the area where we do business. ...Before if they caught us, they would just ask us to pay a fine and would let us go. Now they send us to the reeducation camp, to the labor camp. Our area used to have twenty to thirty ladies (xiao zi), now there are only around ten. The police had locked up over half, all of those who were locked up used drugs.

Since drug taking sex workers need to earn enough money each day to support their habits, intense police raids further undermine their ability to negotiate safe sex with customers, who are becoming increasingly difficult to find amid the fear of being arrested. Conversations with informants suggested that a female IDU sex worker in the throes of a craving is unlikely to let go of a valuable customer even if he refuses to use a condom.

While low condom usage by customers exposes female IDUs who are commercial sex workers to a greater risk of HIV infection, sex work also reduces family support and bars access to state-sponsored methadone programs. As Table 4 shows, sex workers and non-sex workers in the female IDU subsample of our study differed significantly with respect to risk factors. Compared with non-sex workers, sex workers were likely to be younger, to be receiving less family support, to be facing greater economic pressure, and to have been denied access to a methadone program.

As mentioned, in China, a sex worker will normally travel to other towns or cities to conduct her business in order to avoid being known by fellow residents of her home town about her new trade, and to minimize the chance of criminalization by law enforcement agencies in her home town who can easily track her down. As sex workers are not working in their home towns, it is difficult for their family members to visit them frequently and offer them help and care when needed. Their illegal migrant status also excludes them from the services of the state-sponsored methadone program.

Findings of our study have several policy implications for HIV/AIDS intervention and prevention efforts in China. First, the differences between male IDUs and female IDUs in both HIV-related risk behavior and its associated risk factors are strong signals suggesting that drug users are not an homogeneous group, and that effective prevention and intervention measures must be sensitive to such gender differences. Second, risk factors for male IDUs and female IDUs, albeit dissimilar, are shaped by gender norms surrounding needle sharing and unsafe sex in the context of social relations. Prevention and intervention programs should address the fundamental gender norms, so ingrained in the Chinese culture, by promoting equality between the two sexes in decision-making in matters relating to sexual intimacy. Needle sharing should not be a means for a man to express masculinity among peers, nor should it be a way for a woman to show submission and loyalty to her injecting male partner. Protected sex should be a woman’s right not only during sexual intercourse with her intimate partner, but also on occasions involving commercial sex service.

Besides the need to educate both drug users and the general public about the risk of gender inequality in sex matters, programs targeting male IDUs should be aware of the higher risk facing male IDUs who are relatively young and who have little family support. Programs aiming at female IDUs will need to differentiate between those who have not been engaged in sex work and those who are already active in the trade. For the former, efforts can mainly be directed at the risk of having an injecting sex partner. For female IDUs already engaged in sex work, who face double jeopardy, there should be a balance between the criminalization of commercial sex and the need to reduce the high level of HIV risk facing female IDU sex workers for HIV/AIDS prevention and intervention purposes. As hidden migrants, female IDU sex workers are tremendously socially disadvantaged in the alien community. Perhaps through the coordination of non-governmental social and health service organizations, which are flourishing in China today, harm-reduction measures such as methadone programs and related health services should be extended to migrant female IDU sex workers.

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