Extended Abstract: Virginity and Gender in Shanghai, China: Exploring Migration, Rural, Urban Residence and Age of Sexual Debut

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Abstract

Purpose: Migrants are identified as a high-risk group for HIV and STIs in China. The purpose of this study is to determine age of sexual debut across migrant and non-migrant groups in Shanghai, China. *Methods:* Survival analysis methods were employed on a cross-sectional survey of 6,299 15-24 year olds. Kaplan-Meier estimates as well as Cox proportional hazards models with time-varying effects were used to assess the effects of time-interaction of age of sexual debut with migration status. *Results:* Overall, only 15% of the study population experienced premarital sex, with differences across migration status (p<0.05). Age of sexual debut differed across men and women. For women, rural non-migrants were at greater risk of earlier sexual debut (HR=1.92, CI: 1.34-2.74), and rural-to-urban migrants were at greater risk of sexual debut compared to urban non-migrants (HR=1.79, CI: 1.07-2.99). *Conclusions:* Results indicate that prevention efforts should target rural non-migrants and rural-to-urban migrant women.

Introduction

Across the world, earlier age of sexual debut has been associated with increased risks of unintended pregnancy and sexually transmitted infections (STI), including HIV [1-4]. Risk behaviors associated with early age of sexual debut are thought to mediate acquisition of HIV, including increased numbers of lifetime sexual partners, sexual intercourse under the influence of alcohol, not completing high school, and higher rates of unprotected sex [1, 5-7]. In China, the HIV prevalence is 0.1%, but with 1.3 billion individuals, this translates to over 700,000 infected individuals [8]. Like the rest of the world, young people in China are more likely to contract HIV, with 6 out of 10 infected individuals between 15 and 29 years of age [9]. Despite increased vulnerability, few studies exist on the sexual behaviors among youth in China.

In particular, migrants are identified as a high-risk group for STIs [10-13] due to lax social control, social isolation and living away from family, as well as increased exposures to a burgeoning commercial sex industry [14-16]. Moreover, migrant women are especially vulnerable. Wang and colleagues [13] found that migrant women had three times the prevalence of chlamydia infection compared to rural non-migrant women; and among migrants, women were more likely to be infected with an STI than men. Increasing STI trends have been associated with changing sexual attitudes and norms in China [17]. For example, between 1955-2000, commercial sex patronage increased from 5% to 19% and concurrent partnerships increased from 13% to 25% [18]. Premarital sex has also increased,

particularly among younger age groups [18]. In the context of increasing STI trends and changing sexual norms, careful monitoring of the age of sexual debut across risk groups is important for prevention efforts.

The current dataset provides an opportunity to explore transition to first sex among youth who are experiencing a unique period in China's history. In the past thirty years China has witnessed critical social and economic transformations, which many argue have resulted in the opening up of the country and a 'sex revolution' among younger generations [18-22]. This paper addresses two critical gaps in the literature on the sexual behavior of migrants using survival analysis methods to explore transition to first sex. Specifically, it includes multiple migrant groups, rather than focusing on only rural-to-urban migrants. Second, it analyzes data by gender, which is important in understanding modifiable risk exposures across group. The objective of this paper is to examine the age of transition to sexual debut across non-migrant and migrant groups in Shanghai, China.

Methods

Subjects and Procedures

The sample for the present analysis was derived from the Three-City Asian Adolescent and Youth Survey conducted in 2006. The data were collected from 17,016 young people aged 15-24 in urban and rural districts of Taiwan, Shanghai, and Hanoi. The overall goal of the study was to investigate the impact of family, peers, community, and exposure to macro-level influences (media, modernization etc.) on adolescent sexual and reproductive health issues [23].

The analytic sample for the present paper is restricted to a sub-sample of 6,299 participants in Shanghai. Because the focus of this paper is on premarital sex, analyses will be restricted to youth who answered that their first sexual experience was with a non-marital partner, which is less than 1% of the study population. Due to small sample size, three groups of migrant youth were further eliminated from the sample: rural-to-rural migrants (n=37), urban-to-rural migrants (n=1), and international migrants (n=1). In total, we retained 6,194 participants in this analysis, including 3409 urban non-migrants, 1565 rural non-migrants, 590 rural-to-urban migrants, and 630 urban-to-urban migrants. All surveys were administered using Audio Computer Assisted Self-Interview (ACASI) due to sensitive questions regarding health risk behaviors, including sexuality.

Outcome Measure

The dependent variable – age of first sex—was based first on responses to the question of whether study participant had had sexual intercourse. For those who responded affirmatively, the follow-on question was: "How old were you the first time you had sexual intercourse?"

Major Predictor

Migrants were classified based on a set of questions about current and prior residence. In addition, in order to establish temporality, individuals were only classified as migrants if they migrated before their first sexual experience. For the purposes of this paper, 'migrant status' refers to categorization of individuals as urban non-migrants, rural non-migrants, rural-to-urban migrants, and urban-to-urban migrants.

Background characteristics

The data contain a number of demographic characteristics including *age, gender, marital status, knowledge of the Shanghainese language*, *ever use alcohol,* and *registration as a permanent resident of Shanghai.* We created an index of *socioeconomic status* using a set of household asset variables. All indicators are binary, and principal component analysis was used to classify individuals in to economic tertiles (e.g., low, middle and high) [24]. *Family structure* was measured as a categorical variable including living with parents, living alone, living with other relatives, or living with others (including peers or dormitory). *Education* was coded as primary school or less, junior secondary education, senior secondary education, and college/university. Participants' *activity status* indicates that a participant was in school only, working only, both in school and working, or neither. Employment was coded as professional (defined as participants who reported being a manger, professional, or having technical jobs), non-professional (defined as participants who were vendors, mechanics, in construction, working in factories), and other (other categories included artists etc.)*.* Participants were asked about their first *sexual partner* categorized as 1) fiancée, 2) lover, 3) hooked-up/friend, and 4) other, which included commercial sex workers and relatives. The indicator of *recency of migration* is the difference between a migrant's age and their age of migration, measured as a continuous variable. Finally, the variable indicating the *reasons for migration* include moving for education, moving for activity, and other reasons (e.g. move with family, want to live on own, married or moved with partner, join someone else in city etc.).

Analyses

Because age of sexual initiation is measured as time to event, survival analysis was used to estimate the distribution of age of sexual initiation and how this distribution is associated with migrant status. The data is right-censored as not all respondents have experienced sexual initiation at the time of the survey interview [25]. Individuals who had not yet had sexual intercourse were censored by their age at the time of the survey.

Cox Proportional Hazards Model: Testing the proportional hazards assumption

Cox proportional hazards models were applied to control for background characteristics [26]. An advantage of this model is that is does not require a specified baseline hazard, $h_0(t)$, or a particular probability distribution to represent survival times; therefore, it is not subject to model constraints like most other parametric models [26].

Cox proportional hazards models assume that the hazard ratio of sexual debut is constant across follow-up time; therefore, it is the same at the time of origin and each following year. The proportional hazards assumption was tested for in a number of ways including graphical and statistical tests. First, Kaplan-Meier survival curves and smoothed hazard estimates provide visuals for assessing the proportional hazards assumption. If the assumption holds, then the Kaplan-Meier survival and hazard curves for each group will be approximately parallel at each time point [27]. The log rank test, a nonparametric test, assessed differences in the timing of sexual initiation between migrant status groups [26]. The survival and smoothed hazard curves overlapped across certain points, indicating that hazards

are not constant across time. Next, Therneau and Grambsch's test assessed

generalized linear regression of the scaled Schoenfeld residuals for non-zero slope,

using a global test for each predictor in the model to assess for non-proportionality

[26, 27]. Plots of the Schoenfeld residuals using a *lowess smoother* also tests for non-

zero slope. These tests indicated that rural non-migrants and rural-to-urban

migrants, specifically, violated the proportionality assumption ($p \leq 0.05$). To explore

the time-varying effects, rural non-migrant and rural-to-urban migrant was

interacted with a linear time function. The time-varying estimates for rural non-

migrants and rural-to-urban migrants were statistically significant, validating that

the variables continuously vary with respect to time. Sensitivity analyses fitting a

quadratic time function was also fit to the models, but the parsimonious linear time

function was chosen due to better fit with the data.

Background characteristics that were associated with the predictor of

interest and outcome at $p \leq 0.05$ level were included in Cox multivariate models as

potential confounders. The final model was selected using likelihood ratio tests. To

account for the survey design, all analyses are weighted and use robust standard

errors. Survey weights are used to avoid biased estimates, while robust standard

errors are used to account for clustering of observations as a result of clustered

sampling [28].

Results

Demographic Characteristics

In total, 6194 participants were included in the analysis. Urban non-migrants

made up the largest proportion of the sample (60.8%), followed by rural non-

migrants (25.1%), urban-to-urban migrants (7.4%), and rural-to-urban migrants (6.6%). See Table 1 for basic demographic characteristics of the sample population, by migration status.

In the total sample, 85% had not yet engaged in their first sexual experience (n=5235), with statistically significant differences across migration status (p=0.02) (see Table 2). Among those reporting having had premarital sex, the majority were urban non-migrants (60.8%), followed by rural non-migrants (25.1%). Rural non-migrants had the highest levels of premarital sex with 18.5%, followed by rural-to-urban migrants (17.6%), urban-to-urban migrants (17.6%), and lastly, urban non-migrants (12.9%). A higher proportion of males also experienced premarital sex compared to females (17.6% vs. 12.4%), although this differed across migration status for women, but not for men (see Table 2).

Turning to migrant-specific characteristics, migrants lived in Shanghai for an average of 3.3 years, with urban-to-urban migrants living in the city for a longer period of time on average (3.9 years vs. 2.6 years, p<0.05). Rural-to-urban migrants were more likely to migrate for labor opportunities (83.9% vs. 28.5%, p<0.05), while urban-to-urban migrants were more likely to move for school (44.5% vs. 6.4%, p<0.05). In regards to health behaviors, 55.2% of the sample had ever drank alcohol, including 61.6% of rural non-migrants who reported ever drinking alcohol compared to 47.8% of rural-to-urban migrants (p<0.05) (see Table 2).

First Sexual Partner

First sexual partners differed by migration status and gender. There was a greater diversity of first sexual partners among men compared to women. Specifically, men were more likely to report first sexual experiences with non-engaged partners compared to women including: having sex with a lover (76.6% vs. 68.4%), hooking up/having sex with friend (14.7 vs. 6.2%), and others such as commercial sex workers and relatives (1.9% vs. 0.5%). Women, on the other hand, were more likely to initiate sex within the context of engagement compared to men (24.9% vs. 6.8%). Both men and women initiated premarital sex primarily with their boyfriends/girlfriends (76.6% and 68.4%, respectively).

There were also marked differences in sexual partners in regards to migration status ($p \leq 0.001$). Reflecting traditional values, both male and female rural non-migrants and rural-to-urban migrants were more likely to report initiating premarital sex in the context of a marital engagement compared to urban non-migrants and urban-to-urban migrants. For example, 15.4% and 11.6% of rural non-migrants and rural-to-urban migrant men, respectively, reported sex with their fiancé, compared to only 2.6% and 1.1% of urban non-migrants and urban-to-urban migrants, respectively ($p<0.01$). Among women, the difference among the groups in regards to sexual relationships in the context of being engaged is even greater. Over 4 out of 10 females reported their first sexual experience with their fiancée, compared to only 7.6% of urban-to-urban migrants, 10% of urban non-migrants, and 37.2% of rural-to-urban migrants ($p<0.01$). Among females, rural-to-urban and urban-to-urban migrant women were also most likely to report hooking up or having sex with a friend (8.4% and 9%, respectively) compared to other groups.

Kaplan Meier and Bivariate Results

Kaplan Meier estimates revealed that only rural non-migrants experienced a median survival time. Among single rural non-migrant youth in the sample, the estimated median age of sexual intercourse is 23 years. The log-rank test of $p<0.001$ reveals that there are significant differences across migration status. Because the proportional hazards assumption was violated among rural non-migrants and rural-to-urban migrants, time-varying effects were fit using a Cox Model. Bivariate results indicate that rural non-migrants have a 17% increase in *hazard* (or the likelihood of initiating sexual intercourse) each year; and the interaction with time test was significant ($p<0.001$). Similarly, rural-to-urban migrants had a 20% increase in hazard per year, and this was statistically significant ($p<0.05$) [Results not shown].

Multivariate Results

Multivariate results demonstrate that migration status is an important factor in delaying first sexual intercourse (Table 3). Results indicate that urban-to-urban migrants and urban non-migrants do not differ in regards to timing of sexual initiation. Rural non-migrants and rural-to-urban migrants, on the other hand, have increased risks of initiating sexual intercourse compared to urban non-migrants and urban-to-urban migrants, but the risk changes over time. Figure 1 presents the hazard ratio function that determines the time-varying coefficient in the range of 13-24 years of age.

The hazard ratio function indicates that at younger ages, living in rural areas and being a migrant from a rural area is associated with a lower likelihood of initiating sexual intercourse compared to urban youth (see Table 4 for hazard ratios for each age in the hazard function, and corresponding confidence intervals). Rural non-migrants and rural-to-urban migrants had increased risk of 16% (p<0.001) and 24% (p<0.01) per year, respectively, of initiating pre-marital sexual intercourse compared to urban non-migrants. Between the ages of 13 and 18, rural non-migrants initiated sex later compared to urban non-migrants, although this was only statistically significant between the ages of 13-15 (see Table 4). At age 20, rural non-migrants have a 31% increased likelihood of sexual debut compared to urbanites (HR=1.31, CI: 1.08-1.58), and this increases yearly and remains statistically significant.

Rural-to-urban migrants demonstrated similar patterns of behavior to rural non-migrants, although the curve shifts and transitions at later ages. For example, being a migrant from a rural area was protective between ages 13 to 19, demonstrating statistically significant differences between ages 13 and 17 from urban non-migrants (Table 4). Based on Figure 1, the hazard ratio functions for rural non-migrants and rural-to-urban migrants cross, indicating that at approximately age 22, rural-to-urban migrants report a greater likelihood of sexual initiation compared to rural non-migrants.

With respect to fixed covariates in the model, female gender, not drinking alcohol, being in lower wealth tertiles, youth who live with their parents, and being in school were associated with a lower likelihood of sexual debut (Table 3). Table 3

presents results at age 22 for the entire sample and females. We focused on this age because it is the national median age of sexual debut in China [18]. Compared to youth who were in school but not working, youth who were neither in school nor had a job had twice the likelihood of sexual initiation (HR=2.05, CI: 1.52-2.76), those who were both in school and had a job had 37% greater likelihood (HR=1.37, CI: 1.03-1.83), and those who were only working had 58% greater risk of earlier sexual debut (HR=1.58, CI: 1.22-2.05). Living with parents was protective - those who lived with other relatives were almost twice as likely to initiate sex compared to those who lived with their parents (HR=1.97, CI: 1.54-2.53). Surprisingly, those in the lowest wealth group delayed sexual initiation compared to the highest wealth group (HR=1.57, CI: 1.21-2.04), and this may reflect differences in sexual permissiveness across the two wealth groups.

Multivariate results by Gender

Women and men demonstrated significant differences based on stratified analyses using Cox proportional hazards models. When testing the proportional hazards assumption among women and men, the assumptions held for men, but not for women, and therefore time-varying covariates are used for women only.

Among women, analyses with time-varying effects were statistically significant for rural non-migrants as well as rural-to-urban migrants (Table 4). Both female rural non-migrants and rural-to-urban migrants had a 22% greater likelihood of initiating sexual intercourse per year. Similar to the overall sample, the hazard ratio function suggests a protective effect at earlier ages (ages 15-19) and

higher risk of sexual initiation at later ages (ages 20-24) (Figure 2). For example, at 20 years of age, rural non-migrants were 57% more likely to transition to first sex compared to urban non-migrants (HR=1.57, CI: 1.12-2.21); rural-to-urban migrants, on the other hand, demonstrated statistically significant higher risk of sexual debut at age 22 (HR=1.79, CI: 1.07-2.99). By the end of follow-up at age 24 years, rural non-migrant and rural-to-urban migrant women were 3.5 and 2.7 times more likely to initiate sexual intercourse, respectively, compared to urban non-migrants. Among unmarried women who remained virgins until age 22, rural non-migrants had twice the hazards (HR=2.34, CI: 1.54-3.55) and rural-to-urban migrated had 79% increased hazards of sexual debut compared to urban non-migrants (HR=1.79, CI: 1.79-2.99).

Results are presented for men with no time-varying effects because the proportional hazards assumption was not violated; therefore, results are the same for any age. There were no differences across migration status among men for age of sexual initiation. Therefore, migration status was not a significant predictor in delaying age of sexual initiation among men, controlling for background characteristics (Table 3).

A number of demographic characteristics were significantly associated with sexual debut for both genders. Men and women who used alcohol had increased risk of initiating sex compared to those who never used alcohol (HR=2.17, CI: 1.67-2.82 and HR=1.77, CI: 1.29-2.43, respectively). Attending school was a protective factor for men and women in delaying sexual intercourse. Women who were neither in school nor had a job were almost twice as likely to initiate sexual intercourse, while

being in school/ not employed for males was protective compared to all other categories including being neither in school/having a job, only having a job, and having both a job and being in school. Lastly, living with parents was also a protective factor. Men who lived with other relatives or lived in a dorm were 71% and 26% more likely, respectively, of sexual debut, while women who lived with other relatives had almost two times greater likelihood of sexual debut (HR1.99, CI: 1.46-2.72). For men, higher socioeconomic status was also associated with earlier age of sexual debut. For example, those in the highest wealth tertile were also more than twice as likely to initiate sex compared to those in lower wealth levels (HR: 2.06, CI: 1.50-2.84).

Discussion

Sexual norms in Chinese urban cities and rural villages are transforming, particularly among younger generations [17, 18]. Sexual activities such as masturbation, premarital sex, and accessing commercial sex are becoming increasingly common [18]. Despite changing sexual attitudes, the discourse surrounding sexuality in China has only recently shifted outside the context of marriage [19, 20]. Our results suggest that premarital sex is occurring across a diversity of sexual relationships, and that differences exist across rural and urban areas, migrants and non-migrants, as well as gender lines.

Nevertheless, virginity before marriage remains the norm [18]. In our sample of 15-24 year olds, only 15.0% have had premarital sex, a much lower prevalence compared to other parts of the world [4, 29, 30]. In the United States, for example, 46.0% of high school students report ever having sexual intercourse (45.7% and

46.1% for females and males, respectively) [29]. These estimates are similar to other studies conducted in China. For example, based on the China Health and Family Life Survey (CHFLS), the first ever nationally-representative survey on adult sexual behavior, Parish and colleagues reported an overall premarital sex prevalence of 14% in cohorts post-1980, with 25% and 9% among urban and rural men, respectively [18]. Moreover, the median age of sexual debut in China remains later at 22.5 years [18] compared to other parts of the world including the United States at about 17 years of age [31] as well as African countries [4, 30].

Differences in sexual debut existed across migration status among women in the sample; however, there were no differences in sexual debut across migration status among men, nor were there age effects for men. One possible explanation is that societal norms and attitudes regarding virginity differ for males and females- a woman's social standing lowers as she experiences sexual intercourse outside the context of engagement or marriage [20]. Whereas women in rural areas are expected to conform to traditional gender roles, no such expectations exist for men [18]. Furthermore, our results suggest men reported a greater variety of first sexual relationship partners compared to women. Women are more likely to report a first sexual experience in the context of an engagement, while men are more likely to report less stable unions such as hooking up, having sex with a friend, commercial sex worker, or lover. Because men have more freedom of options for sexual partners, sex does not have to occur in the context of a stable relationship.

Our findings suggest that living in a rural area or being a rural-to-urban migrant was protective in adolescence; however, in early adulthood, when the

majority of youth initiated sexual intercourse, rural non-migrants and rural-to-urban migrants demonstrated the greatest likelihood of sexual debut compared to urban youth. These results may be explained by a number of inter-related factors. First, urban areas are less likely to be governed by traditional values, and more likely to adopt liberal sexual attitudes and practices [22]. This may explain the delayed onset of sexual behavior among rural youth.

In early adulthood, however, urban youth are more likely to delay sexual initiation. This may be due to the diverging age of marriage across rural and urban areas, and how migration may disrupt the process of family formation. In China, the mean age of marriage is 25.2 and 23.2 years for men and women, respectively [32]; and existing literature suggests individuals from rural areas marry significantly earlier compared to urban areas [33]. Rural women in this study were most likely to experience a first sexual encounter with their fiancée compared to any other groups, suggesting that premarital sex is occurring at earlier ages among rural non-migrants because they are with their potential future husbands. Moreover, studies documented greater acceptability of cohabitation for engaged couples in rural areas [34]; therefore, this suggests that acceptability of premarital sex in the context of engagements may be increasing in rural areas. In a country where commercial sex and concurrent sexual partnerships is increasing [18], premarital sexual activities in the context of cohabitation, or even engagements, may have adverse consequences.

Theories on marriage markets suggest that higher education and complex labor pathways lead to later marriages [35]. Economic reforms from the Open-Door Policy in 1978 as well as increases in formal education resulted in increased

migration from the countryside to urban centers, with rural-to-urban migrant women more likely to work outside of the family farm compared to rural non-migrants [36]. Participating in the labor market may lead women to marry at later ages due to potential job requirements including more formal and informal training, job relocation, schedules and needing to work overtime – these requirements make it more difficult to encounter a partner that is malleable to these constraints [35]. Therefore, because urban youth and migrants generally have higher educational status/opportunities compared to rural non-migrants, they are more likely to delay marriage, and thus, sexual activity.

While migration brings a number of benefits, exposure to a new urban environment may also bring risks [6]. For example, labor markets continue to be segmented, with migrants experiencing discrimination and lower social status [36, 37]. Moreover, how do migrants navigate a new social milieu in the context of transitions and change? While traditional values are engrained in migrants, they face the realities of exorbitant housing prices in Shanghai as well as living away from their families; increased sexual risk behaviors such as cohabitation is common and popular among this population [16]. Loneliness and social isolation may drive male migrants to sex workers [15], while migrant women may be forced in to sex work or service industries [38].

Urban locals, on the other hand, are more likely to obtain professional jobs, have better living conditions, higher income, and more comprehensive benefits [37]. Our findings also suggest that urban-to-urban migrants are more likely than rural-to-urban migrants to move for educational purposes, be more highly educated, and

be in a higher socioeconomic group. In sum, differences in social status may explain rural-to-urban migrants' increased risks compared to urban migrants and non-migrants.

There are several limitations to the study that are worth discussing. First, the cross-sectional nature of the survey does not allow us to assess timing of covariates and age of sexual initiation. Because we had the age of migration, however, this study was able to identify migration that occurred before age of first sexual initiation. Second, all data are self-reported, and because premarital sexual activity continues to be a sensitive topic of discussion in China, responses may be subject to social desirability bias. However, the use of ACASI has been shown to promote honest reporting to sensitive questions [39, 40]. Third, these data are taken from rural and urban areas of Shanghai, arguably the most modern city in China. The extent to which these results are generalizable to other rural and urban areas should be assessed. Lastly, because of data limitations, rural-to-rural and urban-to-rural migrants were not assessed. Other studies have demonstrated that these migratory pathways, in particular, are associated with greater risk for women [6]. In addition, multiple migrations should also be taken in to account, as migratory patterns in China is characterized as circular and temporary [41].

Despite these limitations, this study offers a unique opportunity to explore rural, urban, and migration effects on delay of sexual initiation. There is a clear social stratification across urban and rural areas, suggesting that sexual behaviors will further diverge in the future. We identified two risk groups in this study: rural non-migrant women and rural-to-urban migrant women. A potential strategy is to

focus prevention efforts on rural areas as these analyses suggest that a rural effect may actually be protective in the early and late-adolescent period; however, risks for rural youth and rural-to-urban migrants increase over time. In urban areas, targeted prevention efforts should be promoted among migrant females from rural areas, particularly educating them on how to negotiate changing sexual values from rural to urban areas. Moreover, there is an urgent need for local family planning services to focus on young people outside the context of marriage. A study found that only one out of four family planning workers agreed that services should be available for unmarried senior high school students [42]. Especially in rural areas that are presumably more conservative, it is also important to offer services to unmarried individuals, where premarital sex in the context of being engaged and cohabitation may be more acceptable.

Moreover, greater access to education and better employment prospects is important for the well being of youth. Educational and labor equality should be promoted in rural areas, particularly among young females. Lastly, this study suggests that investigating time-varying effects will provide insights on important time patterns across groups. Future research using the Cox proportional hazards model should rigorously test the proportional hazards assumption, as failing to do so will provide biased interpretations.

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Table 3.1. Demographic Characteristics, by Migration Status

	Urban non-migrant (n=3409, 60.8%)	Rural non-migrant (n=1565, 25.1%)	Rural-to-urban migrant (n=590, 6.6%)	Urban-to-urban migrant (n=630, 7.4%)	Total (N=6194)	P-Value
Age cohort						0.027
15-19 years	56.2	62.5	54.6	47.5	57	
20-24 years	43.8	37.5	45.4	52.5	43	
Gender						0.051
Male	49.8	52.2	46.5	41.8	49.6	
Female	50.2	47.8	53.5	58.2	50.4	
Wealth tertile						0.000
Low	15.3	51.9	90.5	62.4	33	
Mid	70.7	40.9	8.3	29.5	56	
High	14	7.1	1.2	8.1	11	
Highest Educational Level						0.000
Primary or less	5.2	3.6	4.7	3.7	4.7	
Junior Secondary	36.5	54.8	79.5	27.2	43.3	
Senior Secondary	42.7	36.7	14.1	51.7	40	
College/University/Graduate	15.5	4.9	1.6	17.4	12.1	
Current in job/School						0.000
In School but no Job	65.9	58.8	6	43.4	58.5	
Neither job nor school	4.7	14	7.9	3.6	7.2	
Both Job and School	8.4	2.6	1.1	11.2	6.7	
Job but no school	20.9	24.6	85	41.8	27.7	
Type of Work						0.000
Professional	34.6	17.7	3.1	26.9	26.5	
Unprofessional	62.9	81.6	96.4	62.3	70.8	
Other	2.5	0.7	0.5	10.8	2.8	
Family						0.000

Structure

Parents	81.2	63.1	6.7	19.7	67.1	
Alone	0.6	3	2.8	3.6	1.6	
Other Relatives	3.2	6.4	5	6.9	4.4	
Friends/Dorm	15.1	27.5	85.6	69.8	27	
No household registration (no hukou)						0.000
Hukou	98.9	94.9	2.4	38.7	87	
No Hukou	1.1	5.1	97.6	61.3	13	
Speak Shanghainese Dialect						0.000
No	2.9	13.7	78.5	59.8	14.8	
Yes	97.1	86.3	21.5	40.2	85.2	
Reason for Migration University/School	N/A	N/A	6.4	44.5	26.5	0.000
Employment	N/A	N/A	83.9	28.5	54.6	
Other	N/A	N/A	9.7	27	18.9	
Recency of migration (years)	N/A	N/A	2.6	3.9	3.3	0.004

Table 3.2. Health and Sexual Behaviors, by Migration Status

	Urban non-migrant (n=3409, 60.8%)	Rural non-migrant (n=1565, 25.1%)	Rural-to-urban migrant (n=590, 6.6%)	Urban-to-urban migrant (n=630, 7.4%)	Total (N=6194)	P-Value
Ever drank alcohol						0.000
Never	47.8	38.4	52.2	35.8	44.8	
Ever	52.2	61.6	47.8	64.2	55.2	
Premarital Sex						
Overall (%)	12.9	18.5	17.8	17.6	15.0	0.021
Men (%, n)	16.0 (287)	18.6 (155)	21.6 (58)	25.9 (60)	17.6 (560)	0.063
Women (%, n)	10.0 (179)	18.4 (141)	14.5 (43)	11.6 (36)	12.4 (399)	0.001
Median age of sex (years)	20	21	21	20	20	
First Sexual Partner						
Men						0.001
Lover	78.9	69.8	70.6	88.6	76.6	
Fiancée	2.6	15.4	11.6	1.1	6.8	
Hooked up/just met/friend	15.9	14.1	14.5	9.2	14.7	
Other: CSW, relative etc.	2.5	0.7	3.3	1.1	1.9	
Women						0.000
Lover	83.1	48	54.4	83.4	68.4	
Fiancée	10	46.4	37.2	7.6	24.9	
Just/just met/friend	6.9	4.1	8.4	9	6.2	
Other: CSW, relative etc.	0	1.5	0	0	0.5	

Figure 3.1. Hazard Ratio Function, by Migration Status for Total Sample

*Reference line represents urban non-migrants
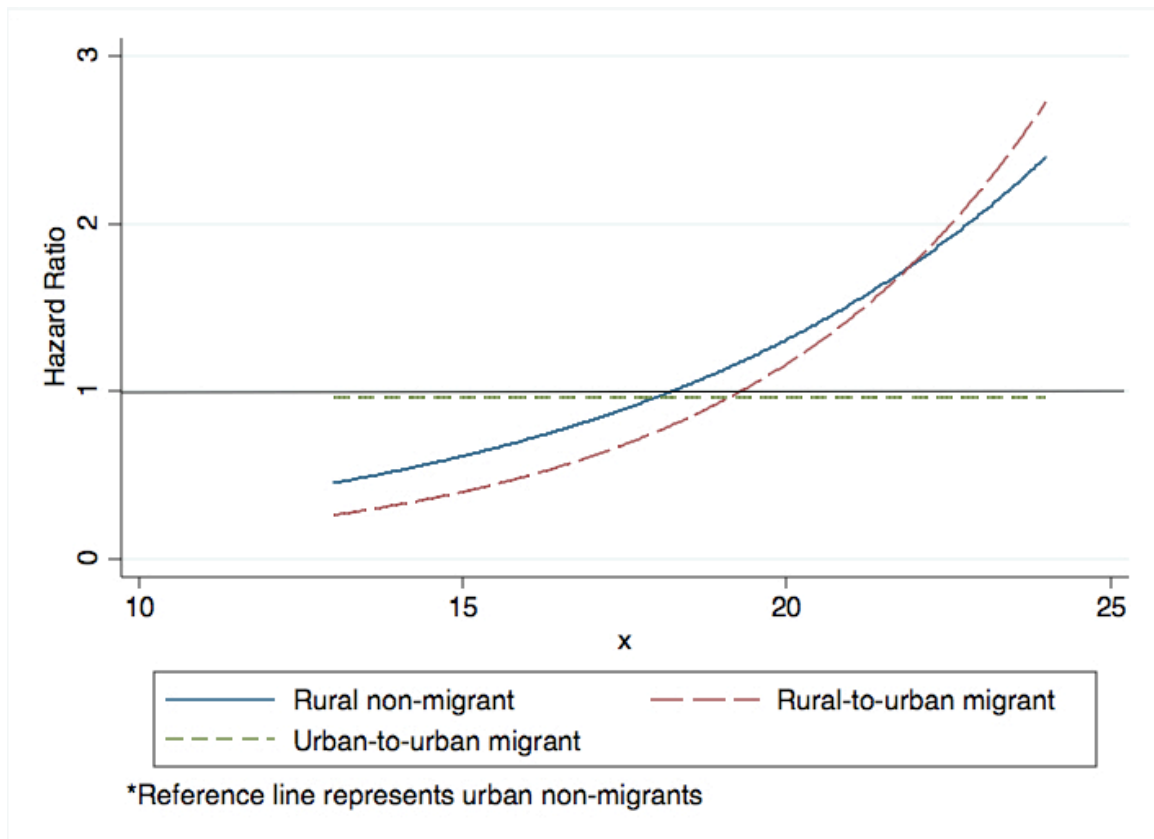
Figure 3.2. Hazard Ratio Function, by Migration Status among Females
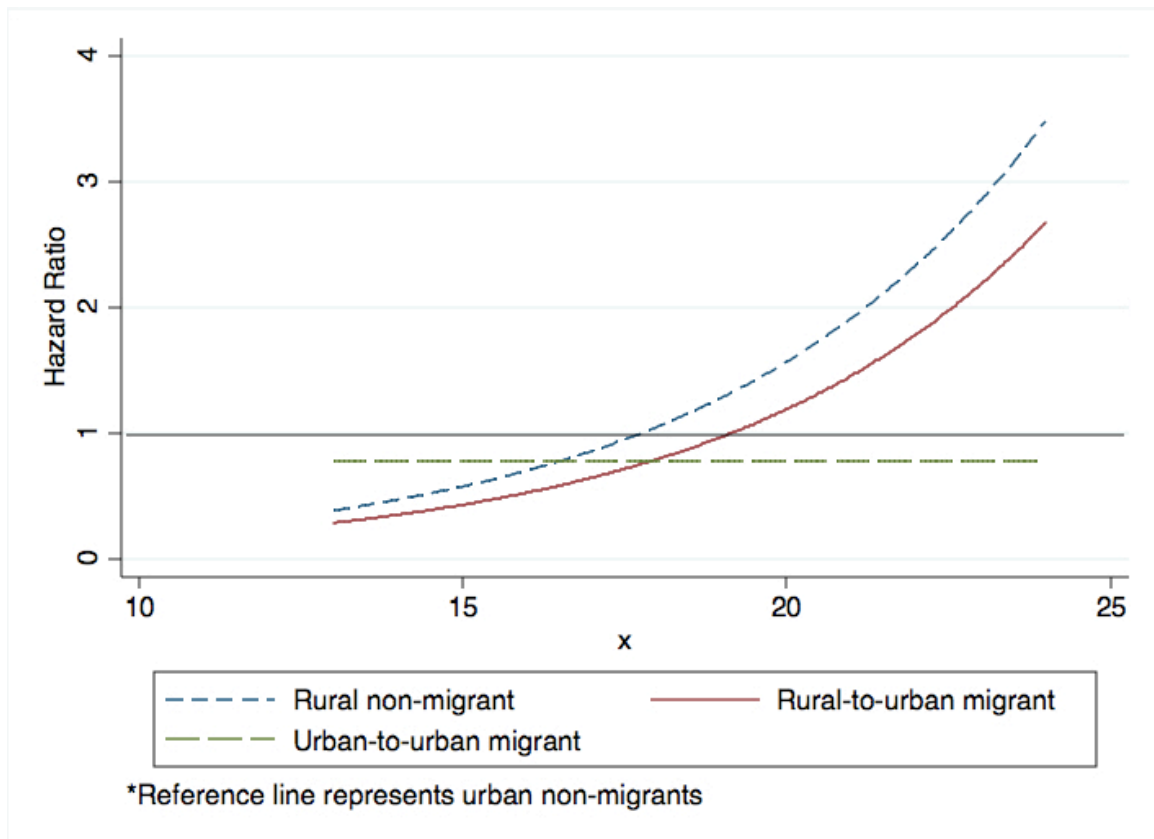

*Reference line represents urban non-migrants

Table 3.3. Cox Proportional Hazard Multivariate Results at age 22, by Gender

	All (N=6194)	Male (n=3031)	Female (n=3163)
	OR [CI]	OR [CI]	OR [CI]
Urban non-migrants	1.00	1.00	1.00
Rural non-migrants	1.77***	1.11	2.34***
	[1.39 - 2.26]	[0.88 - 1.42]	[1.54 - 3.55]
Rural-to-urban migrant	1.78*	0.99	1.79*
	[1.02 - 3.12]	[0.62 - 1.58]	[1.07 - 2.99]
Urban-to-urban migrant	0.96	1.05	0.78
	[0.77 - 1.20]	[0.73 - 1.50]	[0.46 - 1.32]
Male	1.00	-----	-----
Female	0.78***	-----	-----
	[0.67 - 0.90]	-----	-----
Never use alcohol	1.00	1.00	1.00
Ever use alcohol	1.93***	2.17***	1.77***
	[1.56 - 2.39]	[1.67 - 2.82]	[1.29 - 2.43]
Lowest SES	1.00	1.00	1.00
Average SES	1.02	1.01	0.86
	[0.82 - 1.27]	[0.77 - 1.34]	[0.63 - 1.17]
Highest SES	1.57***	2.06***	0.80
	[1.21 - 2.04]	[1.50 - 2.84]	[0.53 - 1.22]
School only	1.00	1.00	1.00
Neither school/job	2.05***	1.92***	1.98**
	[1.52 - 2.76]	[1.38 - 2.68]	[1.23 - 3.18]
Both school/job	1.37*	1.43*	1.37
	[1.03 - 1.83]	[1.05 - 1.95]	[0.84 - 2.25]
Job only	1.58***	1.90***	1.17
	[1.22 - 2.05]	[1.47 - 2.46]	[0.74 - 1.85]
Live with Parents	1.00	1.00	1.00
Alone	0.87	0.82	1.14
	[0.58 - 1.32]	[0.45 - 1.51]	[0.56 - 2.29]
Relatives	1.97***	1.71***	1.99***
	[1.54 - 2.53]	[1.29 - 2.26]	[1.46 - 2.72]
Friends/Dorm	1.12	1.26*	0.94
	[0.90 - 1.39]	[1.01 - 1.58]	[0.65 - 1.36]

Notes:
- Entire Sample Time-varying effect: Rural non-migrant: HR 1.16***, CI: 1.08-1.25; Rural-to-urban migrant HR: 1.24**, CI: 1.06-1.44
- Female Sample Time-varying effect: Rural non-migrant: HR 1.22**, CI: 1.07-1.44; Rural-to-urban migrant HR: 1.22*, CI: 1.04-1.44

Table 3.4. Adjusted Hazard Ratio of Sexual Debut by Migration Status and Age

| | **All** | | | **Female** | | |
	Rural Non-migrant	Rural-to-urban Migrant	Urban-to-urban migrant	Rural Non-migrant	Rural-to-urban Migrant	Urban-to-urban migrant
All ages (No time-varying effects)	-----	-----	0.96	-----	-----	0.78
	-----	-----	[0.77 - 1.20]	-----	-----	[0.46 - 1.32]
Age 13	0.45**	0.26**	-----	0.39	0.29	-----
	[0.26 - 0.79]	[0.10 - 0.72]	-----	[0.14 - 1.05]	[0.07 - 1.15]	-----
Age 14	0.53**	0.33*	-----	0.47	0.35	-----
	[0.33 - 0.85]	[0.14 - 0.77]	-----	[0.20 - 1.13]	[0.10 - 1.21]	-----
Age 15	0.61*	0.40*	-----	0.58	0.43	-----
	[0.41 - 0.93]	[0.20 - 0.83]	-----	[0.27 - 1.23]	[0.15 - 1.27]	-----
Age 16	0.72	0.50*	-----	0.71	0.53	-----
	[0.50 - 1.01]	[0.28 - 0.90]	-----	[0.37 - 1.34]	[0.21 - 1.35]	-----
Age 17	0.83	0.62*	-----	0.86	0.65	-----
	[0.62 - 1.11]	[0.38 - 0.98]	-----	[0.50 - 1.47]	[0.29 - 1.44]	-----
Age 18	0.97	0.76	-----	1.05	0.80	-----
	[0.76 - 1.23]	[0.52 - 1.11]	-----	[0.68 - 1.64]	[0.41 - 1.56]	-----
Age 19	1.13	0.94	-----	1.29	0.97	-----
	[0.92 - 1.38]	[0.67 - 1.32]	-----	[0.88 - 1.87]	[0.55 - 1.72]	-----
Age 20	1.31**	1.16	-----	1.57**	1.19	-----
	[1.08 - 1.58]	[0.81 - 1.67]	-----	[1.12 - 2.21]	[0.72 - 1.97]	-----
Age 21	1.52***	1.44	-----	1.92***	1.46	-----
	[1.24 - 1.87]	[0.92 - 2.25]	-----	[1.34 - 2.74]	[0.90 - 2.36]	-----
Age 22	1.77***	1.78*	-----	2.34***	1.79*	-----
	[1.39 - 2.26]	[1.02 - 3.12]	-----	[1.54 - 3.55]	[1.07 - 2.99]	-----
Age 23	2.06***	2.20*	-----	2.86***	2.19**	-----
	[1.53 - 2.78]	[1.11 - 4.39]	-----	[1.73 - 4.72]	[1.21 - 3.96]	-----
Age 24	2.40***	2.73*	-----	3.49***	2.68**	-----
	[1.68 - 3.43]	[1.19 - 6.25]	-----	[1.91 - 6.38]	[1.33 - 5.42]	-----

Notes:
- Reference category is urban non-migrants (HR=1)
- Models adjusted for female, ever drink alcohol, socioeconomic status, school/job status, family structure
- Entire Sample Time-varying effect: Rural non-migrant: HR 1.16***, CI: 1.08-1.25; Rural-to-urban migrant HR: 1.24**, CI: 1.06-1.44

- Female Sample Time-varying effect: Rural non-migrant: HR 1.22**, CI: 1.07-1.44; Rural-to-urban migrant HR: 1.22*, CI: 1.04-1.44

*** $p<0.001$, ** $p<0.01$, * $p<0.05$