Title: Determinants of demand for safe sex among male migrants in India

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Abstract

The key variable for analysing unsafe sexual behaviour is consistent condom use. Other variables of interest include economic status, socio-demographic characteristics, migration type, duration, type of occupation, substance abuse, type of sexual partners and exposure to prevention messages. Hitherto, being in a non-monogamous relationship has been clubbed with the choice on condom use in explaining unsafe sex behaviour. This paper assumes a sequential decision-making process in the demand for safe sex in two stages: (a) individuals decide whether he wants to be in a non-monogamous relationship, (b) the non-monogamous individuals in turn take a decision on condom use. The results indicate that while lack of knowledge continues to be an important variable, prevention programmes need to focus on older men irrespective of their marital status. Also, education - rather than economic status - is a more important explanatory variable in this context.

Keywords: Migration, safe sex, condom use, sequential decision, choice, HIV

1. Introduction

Migrants have been central to discussions around growth and development globally. While earlier enquiries around migration focused more on the effects of population mobility and movements on countries (Issac 1947), subsequently, the focus changed with migration playing a central role in labour economics especially to explain economic impact of labour flows in host and source countries (Mincer 1978; Borjas 1994; Borjas 2000). The micro or household level cause and effect of migration was another area that gained some momentum in research. Within this, a large body of literature that concerned itself with the health of the migrants came from disciplines other than economics. While there were increasing concerns about health and quality of life generally (Liu 1975; Hildebrandt and McKenzie 2005), it is the Commission on Social Determinants of Health (2008) that brought together in a comprehensive manner the various determinants of health, with cause and effects of large movements of population playing a central role.

Within health, the HIV epidemic has been a major focus of research and policy for over three decades now, with migration playing a pivotal role in the spread of the virus in the context of developing countries (Saggurti, Schensul and Verma 2009; Saggurti et al. 2011). The bulk of the literature on migrants' sexual behaviours and related HIV risks came from sociology, anthropology and epidemiology. While economic factors like household income often play a role in analyses of sexual risk behaviour, economic research to determine the risk-taking behaviour of migrants remain till date somewhat sparse.

This paper attempts to understand the determinants of risk-taking behaviour of migrants by contending that a sequential decision-making framework may be required to understand (a) why migrants may be engaged in non-monogamous relationships and (b) the factors that determine the demand for condom use among migrants. The argument is that estimating only the demand for safe sex directly, without taking into account factors that influence who decides to engage in non-monogamous relationships in the first place may distort the results of estimation and may be misleading in designing prevention policies. The study applies this methodology to

estimate the determinants of risky behaviour among migrants in India, and adds to the existing literature on sexual behaviour of migrants by offering another way of analysing risky behaviour in a sequential decision-taking framework.

The paper is organized as follows. In Section 2, the concept of risky sexual behaviour is introduced with a brief review of studies on the socio-economic and demographic determinants of risky sexual behaviour among various population sub-groups including migrants. Section 3 describes the framework and methodology used in the paper along with the data sources. The results are presented and discussed in Section 4. Finally, Section 5 presents the conclusion and policy implications of the results.

2. Migrants and risk behaviour: a review

Understanding the factors that have an impact on migrants' sexual behaviour has been an important concern in the context of HIV/AIDS (UNAIDS 2000; White 2003). Researchers have offered plausible hypotheses on the kind of vulnerabilities that may expose migrants to risks of contracting HIV. The dynamics of migration bring into play a gamut of factors like spatial, temporal, structural and institutional, making it a challenge to policymakers to design appropriate prevention activities. For instance, migrants often include a mix of diverse population such as internally displaced people, seasonal migrants, short and long-distance migrants, contract-bound migrant labour, etc, with each group being distinct socially, culturally and economically. Consequently, the groups have varying levels of risks and vulnerability, and targeting all of them under an umbrella intervention may not be very effective (MacPhail and Campbell 2001).

There are many definitions and measures of risky sexual behaviour, depending on the perspective (Uthman 2010). With respect to sexual partners, having multiple partners, partners from specific risk groups, such as commercial sex workers (CSW) or men who have sex with men (MSM) classifies for risky behaviour. The non-use or infrequent use of condom across sexual experiences outside marriage also qualifies as risky behaviour.

Globally, studies have indicated several factors that are associated with unsafe sexual practices among migrant men. These include age, education, marital status and place of residence (Glynn, Caraël, Buvé et al. 2004; Luke 2006; Dinkelman, Lam et al. 2007; Dodoo, Zulu et al. 2007; Hargreaves, Bonell, Morison et al. 2007; Weiser, Leiter et al. 2007; Iorio and Santaeulalia-Llopis 2010). The literature on migration and unsafe sexual behaviour also bring out the importance of all these parameters; in addition, the duration of migration, place of residence, type of occupation, substance abuse, type of sexual partners and exposure to prevention messages have been often mentioned as important determinants of who uses a condom regularly or consistently (Brockerhoff and Biddlecom 1999; Walters, Simoni et al. 2000; Ford, Sohn et al. 2001; Lin, Li et al. 2005; Fosados, Caballero-Hoyos et al. 2006; Ford and Chamratrithirong 2007).

In India, monogamous married women in India comprise 40 percent of the HIV-positive individuals in India, and sex with an infected husband is considered the most serious risk of HIV to women (Rego, Nadkarni et al. 2002; Saggurti and Malviya 2009). The perceived risks of wives and partners of migrant workers stems from their migration and mobility that propels the epidemic by creating living conditions that heighten engagement in risky behaviours, and by providing a vehicle through which infection can move from high to low epidemic regions (Decosas, Kane et al. 1995; Rego, Nadkarni et al. 2002; Saggurti, Schensul et al. 2009). The research studies on migration are mainly limited to the risky sexual behaviour of migrants at destination points. These studies in India as well as other parts of the world suggest that migrants initiate and engage in risky sexual behaviours in places of destination due to separation from their family and spouse for extended periods (Gangakhedkar, Bentley, Devikar et al. 1997; Singh, Mondol et al. 2003; Mishra 2004; Halli, Blanchard, Satihal et al. 2007; Saggurti, Schensul et al. 2009; Verma, Saggurti et al. 2010), though other variables like socio-cultural norms, anonymity of living in a city, illegal residential status, and the nature of work are important as well (IOM and Southern African Migration Project. 2005; Huy, Dunne, Debattista et al. 2011).

Considering the findings of such studies, the HIV prevention interventions have been mostly oriented at either the major destination areas or the work place sites to reach

migrant workers. However, more recent literature indicates that there may be important justifications to intervene at the places of origin as well (Dhapola et al., 2007; Halli et al., 2007; Saggurti et al., 2011). For example, a recent study indicates that while return migrants and active migrants have higher sexual risk behaviors than the non-migrants, most migrants initiate non-marital sex in the place of origin and many continue these behaviors in places of destination (Saggurti, Mahapatra et al. 2011). Besides the debate around initiation of interventions either in destination or origin or both, it is important to understand the factors that impact on migrants' risky behavior of engaging in non-monogamous relationships. The argument is that estimating only the demand for safe sex directly, without taking into account factors that influence who decides to engage in non-monogamous relationships in the first place may distort the results of estimation and may be misleading in designing prevention policies.

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Globally, a number of studies have indicated economic status as a key determinant of unsafe sexual practices. In addition, age, education, marital status and place of residence have also been included in the analysis (Glynn, Caraël et al. 2004; Luke 2006; Dinkelman, Lam et al. 2007; Dodooa, Zuluc et al. 2007; Hargreaves, Bonell et al. 2007; Weiser, Leiter et al. 2007; Iorio and Santaeulalia-Llopis 2010). The literature on migration and unsafe sexual behaviour also bring out the importance of all these parameters; in addition, the duration of migration, place of residence, type of occupation, substance abuse, type of sexual partners and exposure to prevention messages are variables that have been often mentioned as important in determining who uses a condom regularly or consistently (Brockerhoff and Biddlecom 1999; Walters, Simoni et al. 2000; Ford, Sohn et al. 2001; Lin, Li et al. 2005; Fosados, Caballero-Hoyos et al. 2006; Ford and Chamratrithirong 2007).

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These findings support the recommendation that destination areas and the work place are appropriate sites to reach migrant workers with HIV prevention interventions; however, more recent research is increasingly indicating that there may be important justifications to intervene at the places of origin as well. For example, a recent study indicates that while return migrants and active migrants have higher sexual risk behaviors than the non-migrants, most migrants initiate non-marital sex in the place of origin and many continue these behaviors in places of destination (Saggurti, Mahapatra et al. 2011).

In sum, the literature on unsafe sexual practices in the context of migrants is vast and growing, and critical in adding to the body of evidence on the determinants of sexual behaviour. However, the existing literature continues to treat the choice of being in a sexual relationship outside that of marriage/stable partnership together with the choice on condom use.

This analysis offers another way of analysing risky sexual behaviour in a sequential decision-taking framework, explained in the next section.

3. Methodology

The study design involved a survey of migrant male workers from June 2007 to September 2008 to assess the patterns of migration/mobility and to examine its relationship with HIV risks in India. The study was carried out by the Population Council and their research partner institutions in 21 districts across 4 states (Andhra Pradesh, Karnataka, Tami Nadu, Maharashtra) from southern India, that have had high influx of migrants, as indicated by the Census of India 2001. These states are considered to be high HIV epidemic states in the year 2005 by the Indian National AIDS Control Organisation (NACO, 2006). All participants for the survey were selected using a two-stage systematic sampling procedure. Allocation of first stage sampling unit was done at the sub-district level: the migrant worksites and residential colonies (organized labour colonies or makeshift small, poor quality houses) were first mapped and formed into clusters either by combining smaller sites or by dividing larger sites into approximately 5,000 male migrant workers per cluster. Three clusters per district were then selected randomly and migrant males within chosen clusters were systematically sampled to achieve the sample size of 2,500 participants per state. The sample size was determined using an estimated proportion of 15 per cent men having sex outside marriage, an assumed difference of 3 per cent increase in proportion per degree of mobility, a confidence level of 95 percent and power of 80 percent. Further details on the sampling, recruitment procedures and the response rates are published elsewhere (Verma, Saggurti et al. 2010).

There are many definitions and measures of risky sexual behaviour, depending on the perspective (Uthman 2010) used by various studies. Some studies classifies the sex to be risk for HIV if the person has sex with multiple partners, partners from specific risk groups, such as commercial sex workers (CSWs) or men who have sex with men (MSM). The non-use or infrequent use of condom across sexual experiences outside marriage also considered to be risky sexual behaviour. This study uses the following two indicators as dependent measures: sex with non-monogamous partner in last 12

months (yes/no) and consistent condom use in all non-monogamous relationships (yes/no).

TABLE 1 HERE

The independent/explanatory variables used in this analyses include: age, marital status, education, living arrangements, degree of mobility, age at first migration, age at first sex, alcohol use, exposure to sex materials, knowledge of condoms, and income. Detailed description of the variables is shown in Table 1.

4. Model and analysis

The main methodological innovation in this paper is to assume a sequential decision-making process in the demand for safe sex in two stages: in the first stage, it is assumed that the individual decides whether he wants to be in a non-monogamous relationship. Non-monogamous relationships or alliances are defined as having sex with anyone including female or male (paid female partners, unpaid casual female partners, paid male partners, unpaid male partners and transgender) outside marriage or if single, with any male/female, in the last 12 months prior to the survey.

In the second stage, individuals who prefer to be non-monogamous in turn take a decision whether or not they adhere to safe sex behavior with their partners measured by the extent of condom use in non-monogamous sexual alliances mentioned above.

TABLE 2 HERE

About 25 percent of the migrants had sex outside their marriages in the last 12 months. The distribution of non-monogamous partners indicates that a majority of migrants had relations with females who were not sex workers (71 percent)[1], followed by female sex workers (59 percent). Further, 25 percent of those who were married or in stable relationships had a non-monogamous relationship outside marriage.

[1] These percentages will not add up to 100 because a migrant may have more than one type of partner.

Consistent condom use (CCU) is defined as "every time condom use" in the last 12 months for CSW and 6 months for non-CSW due to the different reference periods mentioned in the questionnaire. Interestingly, CCU is relatively much higher at 62 percent with CSW, compared to non-CSW (20%). Overall, only 10 percent of the migrants who were in non-monogamous relationship were using condoms consistently.

Table 2 summarises the definition, coding schemes and descriptive statistics of the variables used in the estimation. Apart from the usual variables like age, education, marital status, income, some additional migrant-specific variable have been considered in the 2 equations of interest, explained in more detail in the next section. .

The data shows that only 25 percent of the sample reported any non-monogamous relationships/alliances, and overall only 10 percent of those in non-monogamous relationship used condoms consistently. To estimate condom use without taking into account preference regarding monogamous relationship is likely to yield inconsistent estimates. This would not be the case if one assumes that every variable that influences the selection (who enters into non-monogamous relationship) is controlled for in the outcome equation (consistent condom use), which is unlikely. The sample of interest - migrants who are in sexual alliances with someone outside of marriage/stable relationship - consists of only those who *choose* to be non-monogamous and may differ in unmeasured ways from those who prefer to be monogamous. It is possible, therefore, that some of the independent variables in the outcome equation are correlated with the unmeasured variable in the overall population, and are therefore, correlated in the selected sample. Such selection bias essentially means that the error terms in the two equations are going to be correlated, leading to inconsistent estimates if selection is not corrected for (Heckman 1979). When both the selection and outcome equations have bivariate dependent variables, one can use a bivariate probit model with sample selection (Dubin and Rivers 1989), along the lines of Heckman's sample selectivity model,

Table 3 shows the summary statistics on the variables used in the analysis. The independent variables in the first stage probit are: age, education, marital status, income, living arrangement at the current place, age at first sex, behavioral factors

like exposure to sexual materials, and migration related variables like age at first migration and mobility at the current place of living. The variables that are *not* used in the outcome equation are living arrangements, age at first sex and the migration-related variables like mobility and age at first move. In addition, CCU is directly hypothesized to be affected by how long the person has been sexually active and correct knowledge regarding condom and HIV.

TABLE 3 HERE

The premise is that sexual history, opportunities to be sexually active outside of a stable relationship (living arrangements, and whether the person stays away from home for long periods), age at first sexual experience directly impact on a person's preference and opportunities vis- a- vis monogamy, but not condom use. Also, consumption of alcohol as a leisure time activity during off/vacation days (not alcohol use prior to sex) was also considered a determinant of monogamous behavior though not of condom use[2].

4. Results and discussion

The results of the regression are presented in Table 4 below.

The estimates of the selection equation that determines who decides to be in a non-monogamous relationship indicate that almost all the variables are significant. The variables that are positively and significantly impacting on the probability of being non-monogamous are: age, less education, alcohol consumption, early migration, high mobility in job and exposure to sexual materials. Income is negatively related to the probability of being non-monogamous.

The equation on use of condom consistently with non-monogamous partners presented in Table 4 shows that some of the common variables of both the equations have significantly opposite effect on CCU, as expected. For example, older and less educated individuals have lower probability of using condoms consistently. Higher the age at first sexual encounter, higher is the probability of CCU. This is not

[2] Information on aalcohol use prior to sex was not available for non-CSW and could not be used in the condom use equation.

surprising, since the men who enter in sexual alliances at higher age have higher exposure to behavior change interventions and are more knowledgeable. Finally, knowledge of condom use has a positive influence on CCU. Interestingly, income and marital status have no independent effect on the decision to use a condom consistently, once selection bias is accounted for.

TABLE 4 HERE

5. Conclusions and policy implications

Condom use has been a much discussed and debated variable in the literature around HIV. The literature review around risk behaviour of migrants specifically, and of men in general, indicate that age, education, income, residence are some of the key variables in condom use as has been cited above. However, the analysis shows that fewer variables impact on CCU once selection bias regarding who enters into sexual alliances outside of marriage or regular partners is controlled for. Thus, for instance, income is no longer a variable of interest and nor is income status. Both these variables are often discussed in the context of condom use. The variables that continue to influence condom use are age (older men are less likely to use condoms), education (less educated men are less likely to use condoms), age at first sexual encounter (higher the age greater is the likelihood of consistent condom use) and knowledge of condom (those with knowledge more likely to use condom).

These results indicate that knowledge of prevention is an important variable in ensuring CCU, and there has to be a continuous effort at including more individuals with appropriate messages. At the same time, only younger men should not be targeted with prevention programmes; older men, irrespective of their marital status also need to be targeted with suitable HIV prevention programmes. Further, it is not necessary that economically vulnerable sections are more prone to such sexual encounters outside marriage; in fact, education rather than income should be the variable of interest in targeting.

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Table 1: Variables used in the analysis from the Male Migrant Survey 2008		
Variable	**Description**	**Coding**
Dependent variable		
Non-monogamous partner	Having sex outside marriage either with a female sex worker or with a non-FSW in last one year	1= non-monogamous; 0= monogamous
Consistent condom use	Males who reported using condom every time during sexual act with non-monogamous partner in last one year	1= consistent condom use; 0 = otherwise
Independent variables		
Age	Age	In years
Marital status	Married or in a live-in relationship back home or currently	Unmarried/single, reference category
Education		
Completed years of education	Illiterate, primary, secondary and above secondary	Categorical variables with higher education as the reference category
Economic characteristics		
Income	Current income at the place of current living	Log income in Rupees
Living arrangement		
Living arrangement	Living alone or with other migrants men at the place of migration	Reference category: living with female partner not wife / wife / family / children / relatives/parents
Migration status		
Early migrant	Number of years since moved: more than 7 years	Reference category: late migrants
Mobility		
Highly mobile	Frequent moving out of residence for job/work	Reference category: less mobile
Sexual history		
Age at first sex	Age at which had first sexual encounter with a woman or a man	In years
Knowledge of condom in HIV prevention		
Knowledge of condom	Knowledge that using condom while having sex prevents HIV	Reference category: no knowledge regarding condom and sex
Behaviour		
Alcohol consumption	Alcohol consumption as a fun activity during off days	Reference category: no alcohol consumption during off days
Exposure to sexual materials	Been exposed to written or visual media that discusses sex, including films	Reference category: no such exposure

Table 2: Summary statistics on dependent variables		
Variable	**Frequency**	**%**
Had sex outside marriage/stable relationship in last 12 months	2804 (N=11219)	25
Distribution of non-monogamous partners in 12 months		
Commercial Sex worker	1679	59
Female non-sex worker	1996	71
Male sex worker/non-sex worker/Hilary	32	0.3
Non-monogamous alliance of those married or in stable relation		
Non-monogamous	2797	25
Condom use with non-monogamous partner(CSW) in 12 months		
Every time	1030	62
Almost every time	249	78
Sometimes	297	18
Never	73	4
Condom use with non-monogamous partners (Female non-sex worker) in 6 months		
Every time	391	20
Almost every time	107	5
Sometimes	394	20
Never	1104	55
Final outcome variable for risk		
Consistent condom use within non-monogamous alliances	1133	10

Table 3: Descriptive statistics of variable used in Heckman Probity Model		
Variable	**Mean**	**Standard Deviation**
Non-monogamous partner	0.249	0.433
Consistent condom use	0.101	0.301
Age	26.550	5.532
Marital status	0.490	0.500
No Education	0.149	0.356
Up till Primary education	0.272	0.445
Up till secondary education	0.329	0.470
Higher education	0.251	0.433
Income (In Rupees)	**8.165**	0.333
Living arrangement	0.663	0.473
Early migrant	0.234	0.424
Economic reasons for migration	0.632	0.482
Highly mobile	0.138	0.345
Age at first sex	20.407	2.853
Knowledge of condom use	0.510	0.500
Consumes alcohol	0.215	0.411

Table 4: Heckman probity estimates of the use of condom among high-risk migrants		
Description	**CONSISTENT CONDOM USE**	**NON-MONOGAMOUS**
	Outcome equation	*Selection equation*
Age	-0.183*	0.240*
Age square	0.003*	-0.004*
No education	-0.353*	0.248*
Education up till primary only	-0.259*	0.267*
Education up till secondary only	-0.051	0.087**
Marital status	0.064	-0.330*
Log of Income	-0.012	-0.203*
Age at first sexual encounter	0.024*	
Knowledge of condom	0.254*	
Alcohol consumption during last month		0.759*
Living arrangement		0.038
Early migrant		0.307*
High mobility		0.216*
Exposure to the sexual materials		0.386*
N censored	8422	
Model Chi-square	26.82	

* Significant at 1 percent

** Significant at 5 percent