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Men's Labor Migration and Sexually Transmitted Diseases among Rural Women in Armenia

Abstract

This study looks at the impact of male migration on STDs among women left behind, using a recent data from a survey of 1240 women in rural Armenia. The study uses self-reported diagnosed STDs and STD symptoms as outcomes of the analysis. The results of negative binomial and logistic regressions indicate that male labor migration increases the odds of having STDs and STD symptoms among women net of other social and demographic factors. The analysis of determinants of STD symptoms detects significant interactions of husband's migration status with household income. The study also examines women's perceptions of husbands' infidelity in connection with STD symptoms and diagnosis. Finally, it indirectly examines possible directions of STD transmission between spouses.

Background and Conceptualization

The association between migration and sexually transmitted diseases (STD) has been studied for a long time. However, since both phenomena have developed into more complex concepts, no approach has been able to give a comparatively comprehensive explanation. The shift in the focus of the research on migration and STDs shows the

development of the disease and increasing complex association with migration processes throughout the world. The most often studied sexually transmitted disease has been HIV since the late 1980's. The interest in HIV can be explained given a wide spread epidemic that is growing bigger involving more various groups every day.

The earlier attempts to explain both the roots of the epidemic and its association with migration usually included a geographical approach. Some researchers were mapping the high HIV prevalence areas and migration routes and destinations to see how both were distributed geographically. It was found that HIV was more prevalent in the areas of migrant labor concentration, or it was spread out along the routes truck drivers usually traveled (Hunt, 1989, Quinn, 1994). The disease was later transmitted migrant labor reserve areas extending the boundaries of the epidemic (Hunt, 1989). The approach that considered migration as a link between high prevalence areas and low prevalence areas contributing to the spread of the disease from the first to latter was no longer able to explain the migration-HIV association as it was not straightforward any more. Coffee et al. (2007) find that geographic connectivity affected the spread of HIV only in the early stages of the epidemic.

Decosas et al. (1995) hypothesize that mobility is an independent risk factor for HIV infection regardless of origin or destination. They suggest that the fact that population movements spread out HIV is secondary to the fact that certain types of migration, rooted in social disruption, cause the HIV epidemic. Three types of migration are considered as risk factors for the spread of HIV and those include labor seasonal migration, female migration usually resulting in sex trade and urban migration (Decosas et al., 1995). Others have found that it was the changing pattern of migration that affects

the HIV epidemic (Lurie et al., 1994, Coffee et al., 2007). Since migrants' home visits have become more frequent as well as migrants' wives have been able to visit their husbands more often due to better transportation, the epidemic has grown out of control.

In order to explain the content of this association, high-risk behavior was suggested as a factor increasing the HIV risks of migrants (Anarfi, 1993, Brockerhoff and Biddlecom, 1999, Lagarde et al., 2003, Coffee et al., 2005, Mtika, 2007). Many studies have found that migrants were more likely than their non-migrant counterparts to engage in high risk sexual relationships with prostitutes, have two or more casual partners (Brockerhoff and Biddlecom, 1999, Lagarde et al., 2003, Coffee et al., 2005, Mtika, 2007), engage in commercial sex trade (Anarfi, 1993), or use alcohol or IV drugs (Yang et al., 2007, Buckley, unpublished). Migrants are believed to involve in HIV high risk activities as a product of lax social control and social isolation. The migrant selectivity approach explains this behavior with the fact that younger, single males are usually selected into migration processes and they are more likely to engage in this kind of behavior (Yang et al., 2007). However, there is also evidence showing that migrants are not more likely to engage in high-risk behavior than non-migrants (Collinson et al., 2006, Mundandi et al., 2006). Moreover, they have increased perception of risks, which may decrease their risks of infection (Collinson et al., 2006).

The newest shift of the focus in HIV-migration research has been the studies of partners left behind. With the increased return migration, migrants' partners' increased HIV risks have become the center of discussion. However, the data on the partners of migrants have shown no significant association between HIV status and having a migrant partner (Lurie et al., 2002). Instead, Lurie et al (2002) found that the risks of women were

related to the number of partners. The further analysis of their data actually revealed that both migrant men and non-migrant women were more likely to get infected outside of the marriage independent of husband's migration status (Lurie et al., 2003). The same study also found that in one third of discordant couples, non-migrant females were the one to carry the disease. These findings open a new field of discussion as migrants may face increasing risks of being infected by their partners along with the risks to be infected from their own high-risk behavior. However, the risks of and from partners of migrants are still a growing area and needs to be studied more.

The HIV epidemic and migration processes in some African settings have been comparatively well discussed as these countries have been most affected by the epidemic. Much less researched have been the countries known as the "second wave" of the HIV epidemic with increasing number of infected people. Former Soviet Union countries are among the "second wave" with high rate of circular migration to Russia and Ukraine that recently have faced rapid increase in HIV/AIDS (Buckley, unpublished). Though the number of HIV infected individuals is still comparatively low, it tends to increase. Since migration is one of the most important labor for males in the area, the countries are at high risk of facing a rapid growth of the HIV epidemic. The STD rates are already high in the area and according to some sources are said to be skyrocketing (Kelly and Amirkhanian, 2003).

The bigger the epidemics grow, the more difficult it is to fight against them or prevent them from further spreading. The HIV epidemic needs to be studied in the "second wave" countries while it is still in its early stage. The social and behavioral characteristics of those who have higher risks of HIV need to be understood in order to be

able to develop intervention strategies while the situation is manageable. The experience of other countries shows that there is a strong relationship between STDs or its symptoms and HIV especially when STDs take the form of ulcerations and lesions (Hunt, 1989, Lurie et al., 2002, Lurie et al., 2003, Lurie et al., 2007, Yang et al., 2007). Therefore, in the countries with still low HIV rates but high STD rates, the association between migration and HIV can be studied through STDs or their symptoms.

Data and Methods

The data for this study come from a survey on Labor Migration and STI/HIV Risks conducted in rural Armenia in June 2007, at the height of out-migration season. The survey was conducted in 31 villages in one marz (province) that is believed to have among the highest rates of labor migration and STD prevalence in the country. A total of 1240 women of reproductive age married to migrants and non-migrants were randomly selected from the village residential rosters. The sampling procedure was designed so as to assure a balanced representation of the two migration categories. The survey questionnaire included questions on socio-demographic and economic characteristics, women's and their husbands' work history, reproductive history, and gender attitudes. A separate module of the questionnaire focused on STDs: women were asked whether they had had any of the seven most common symptoms of STDs and whether they had ever been formally diagnosed with and treated for an STD.

Statistical models

To study the impact of migration on the diagnosed or hypothetical sexually transmitted diseases Logistic regression and negative binomial regression were used. The

models were fitted using STATA and SAS computer programming. All the models control for random effects.

The probability of diagnosed or hypothetical STD. The data include diagnosed diseases, however, this study does not primarily rely on the reporting of diseases as in many cases women are not able (or not willing) to get checked for STDs for economic or other reasons. Therefore the reporting of STDs was complemented with a syndromatic approach by fitting models predicting the self-report of symptoms typical of STDs. The first outcome variable is a dichotomy coded as 1 if women report having at least one STD symptom in last 12 months, and 0 otherwise. The model was fitted using logistic regression.

However, this dichotomy might not be a good indication of an actual STD as it will treat women who report accidental symptom(s), not necessarily related to STD, as being at risk of an STD. To address this issue another outcome variable including all the self-reported symptoms was created. The higher the number of self-reported STD symptoms, the higher the possibility of STD risks. Thus, the next dependent variable is the number of self-reported STD symptoms in the past year. The negative binomial regression was used for this model. Although, the actual diagnosed STD reports might not represent the actual rate of STDs in the area, the probability of actual disease was also modeled to compare with the results from other models. The dichotomy whether or not a woman was diagnosed with an STD in the past three years was used as another outcome. If they have been diagnosed at least once with any STD in past three years it was coded as 1, and 0 otherwise.

The main predictor in the analysis is husbands' migration status. The husband that working abroad at the time of interview, or who had been away for at least three months since the beginning of the year is defined as migrant and coded as 1. Those who were present or working out of village but in the country are defined as non-migrants and coded as 0. Overall, 43.9 percent of interviewed women were married to migrants, and the rest 67.1 percent were married to non-migrants. All three models, with above mentioned STD/symptom outcomes, control for individual-level socio-demographic characteristics and village level variables. The individual-level control variables include women's age (linear and squared) and the difference between husbands' and wives' ages. The quadratic age parameter will control for the changing pattern of sexual activity and fertility as women age. The models also control for women's education, which is treated as dichotomy with vocational and higher education coded as 1 and secondary and less education coded as 0.

To control for reproductive health and behavior the models include the number of children women have and if they have ever had an abortion as a dichotomy (ever had=1, never had=0). On the one hand, induced abortions are believed to be used as a contraceptive method (Todda, 2006), which indicates unsafe sex practices between the couples that in its turn may result in transmission of sexually transmitted diseases. Some findings indicate that the history of induced abortions is significantly associated with syphilis (Bongaerts, 2001). Thus, controlling for abortions indirectly controls for unprotected sexual practices and of hypothetical positive association with the higher probability of having an STD/symptom.

The statistical models also include a few family-level variables. Co-residence with parent(s) in-law is a dichotomous variable in the models, coded as 1 if the family lives with at least one parent in-law. Co-residence with in-laws is considered to be a proxy for social control, as those who live with parent(s) in-law will have less opportunity for extramarital relationships and will be at lower risks of STDs. Another family-level predictor is the monthly family income, which is included in the models as log of income.

The village-level controls include village population size, which is another proxy for social control. The bigger the population, the more anonymity there is and thus less social control over women's behavior. The average driving time to the nearest hospital controls for the accessibility of the healthcare for the women.

The direction of STD transmission. The data does not include information about husband's sexual health or behavior so determining directly whether the reported or hypothetical STD infections are transmitted from husbands to wives or vice versa is not applicable. However, we study the direction of transmission of the disease indirectly. The current study approaches this issue from a women's perspective by testing the association between STD reporting/symptoms and women's perception of husbands' infidelity. If women have not had sexual contacts outside marriage, the most possible source of infection will be the husband. Thus, the STDs and/or symptoms they have should make them more suspicious of husbands' infidelity. The outcome for this model is a dichotomy whether or not women think husband has been unfaithful in last 6 months. If women think that it is very likely or possible they were coded as 1, if they answered that is very unlikely, impossible or they don't know, they were coded as 0. The main predictors

of the statistical model are dichotomous and continuous variables of STD symptoms and the dichotomy for diagnosed STD, tested separately. The controls are woman's age (linear and quadratic), age difference, woman's education, number of children, co-residence with in-law(s), and log income described above.

Results

Table 1 summarizes the distribution of outcome and predictor variables by husband's migration status. The distribution of outcome variables by migration status of the husband shows that two groups are quite different. About 68 percent of women married to migrants have had at least one STD symptom in the 12 months prior to the survey, compared to about 63 percent of women married to non-migrants. Moreover, migrants' wives report more STD symptoms on average in the last year than women with non-migrant husbands by about 0.2. The difference between the two groups of women is more obvious when we compare the diagnosed STD rates. More than 10 percent of women with migrant husband have been diagnosed with an STD in last three years, whereas twice as less (~5%) women with non-migrant husband have had a diagnosed STD during the same period. The big difference in the latter, however, may be due to underling social and economic differences between the groups rather than to the difference in health outcomes.

The bigger is the gap between the two groups when it comes to women's opinion of husbands' unfaithfulness. The majority of migrant's wives think that it is very likely or possible that husband had a sexual intercourse with another woman in last 6 months and only about 10 percent of women with non-migrant husbands believe in their husbands' infidelity.

Table 1. Definition and distribution of individual-level dependent and independent variables by husband's migration status.

	Migrant	Non-Migrant
<i>Outcomes</i>		
Had an STD symptom at least once in last 12 months (%)	67.7	62.5
Number of STD symptoms in last 12 months (mean)	1.56	1.35
Had an STD at least once in last three years (%)	10.5	4.5
Woman's opinion of husband's infidelity in past 6 months (%)		
Very likely or possible	54.6	9.91
Very unlikely, impossible or does not know	45.4	90.09
<i>Predictors</i>		
Woman's age (mean)	31.75	31.02
Age difference between husband and wife	5.45	5.24
Woman's education (%)		
Secondary or less	72.1	63.9
Vocational or higher	27.9	36.1
Number of children (mean)	2.24	2.23
Ever had an abortion (%)	62.68	58.91
Number of abortions woman ever had (mean)	2.15	1.85
Co-residence with in-laws (%)		
Lives with in-law	64.2	67.1
Does not live with in-laws	35.8	32.9
Monthly income of the household (mean)	282.1	232.5

Most of the demographic characteristics of women with migrant and non-migrant husbands do not differ much. The mean age of women for both groups is about 31 and they are about 5 years younger than their husbands on average. The average number of children is about 2 and does not differ between the groups. However, women with migrant husbands have lower education on average, as about 28 percent of them have vocational and higher education, compared to about 36 percent of women with non-migrant husbands. Women married to migrant have higher rates of abortion by about 4 percent as well as more abortions on average than their counterparts married to non-migrants. Slightly higher percent of the women with non-migrant husbands is living with

their parent(s) in-law compared to migrant households. This difference might be related to better economic conditions of migrant families who are more possibly to afford buying a separate house than non-migrant households. This can be partly approved by the distribution of income by the migration status. The average monthly income is higher for migrant households than for non-migrant households by about \$50 on average.

The probability of STD/symptoms and migration. The results of multivariate analysis of the probability of STDs/symptoms are summarized in Table 2. The results are presented as odds ratios. Model 1 presents the association of the main predictor with the outcome variables. The results indicate that for all three outcomes husbands' migration has a significant impact and is positively associated with the probability of STD/symptoms and increases the number of self-reported STD symptoms. When the controls are added to the models (Model 2) the results slightly differ for each outcome. In section A the effect of husband's migration becomes marginal when we control for socio-demographic variables. The stronger predictors of having an STD symptom in last 12 months are having an abortion and the number of children, both of them increasing the probability of having a symptom. Women's education and family income have marginally significant effect on the outcome. While having vocational and higher education decreases the odds of having an STD symptom, income is positively associated with probability of an STD symptom.

In section B husband's migration status is still a strongly significant predictor of the number of symptoms after the control variables are added to the model. The coefficient is slightly smaller, but it is still positively associated with the odds of having an additional symptom. Among other significant predictors are women's education,

Table 2. Odds ratios for the models of the effects of husband's migration status on the probability of ST diseases and symptoms among women.

Predictors	A. Had at least one STD symptom in last 12 months (odds ratios)		B. Number of symptoms in last 12 months (coeff.)		C. Had an STD at least once in last 3 years (odds ratios)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
<i>Individual-level predictors</i>						
Husband's migration status						
Husband is a migrant	1.299*	1.262 [†]	1.177**	1.141**	3.073**	3.127**
Husband is not a migrant (Ref.)	1.0	1.0			1.0	1.0
Woman's age		1.016		1.039		1.085
Woman's age ²		0.999		0.999		0.999
Husband – wife age difference		1.017		1.006		0.966
Woman's education						
Secondary or less (Ref.)		1.0				1.0
Vocational or higher		0.789 [†]		0.859*		0.809
<i>Abortions</i>						
Ever had an abortion		1.696**		1.399**		2.685**
Never had an abortion (Ref.)						
Number of children		1.249*		1.046		1.023
Co-residence with in-laws						
Lives with in-laws		1.083		1.034		1.423
Does not live with in-laws (Ref.)						
Household income (Log)		1.158 [†]		0.979		1.534**
Migrant*Income						
<i>Village-level predictors</i>						
Driving time to the nearest hospital		0.984		0.990*		1.000
Village population size		1.000		0.999		0.999
Number of cases						1238

Significance level : ** - $p < 0.01$; * - $p < 0.05$; [†] - $p < 0.1$.

having had an abortion and time to reach the nearest hospital. Having vocational and higher education decreases the odds of having an additional symptom, however having an abortion has a positive effect on the outcome. The effect of the time to hospital is very small, but counter-intuitive, as an increase in time to hospital is associated with a decrease in the odds of having an additional symptom. This means that time to the nearest hospital is not indicating the accessibility of the healthcare, but rather has more complex association with the number of STD symptoms.

In Model 2 of section C we can see that the husband's migration still increases the odds of having an STD in the last three years by about three times even after controlling for individual-level and village-level variables. Ever having an abortion is another significant predictor of having an STD as it was the case in symptomatic approach. If women have ever had an abortion it increases the odds of having an STD by about 2.6 times. What is different however in this model is that income has a significant effect of having an STD. Each unit increase in log of income is associated with about 53% increase the odds of having an STD. At first this association might seem counter-intuitive, as the wellbeing of a person is an indicator of a better health. However, as the outcome variable represents diagnosed STDs, we should assume that better economic conditions create more chances of seeing a doctor and being diagnosed than those who have less means.

In Model 3 of section B the interaction of migration status and log of income is added to the model. The interaction term was not significant and did not add much to the explanation of other two outcomes (results not shown in the table). However, for the outcome the number of symptoms it reveals interesting patterns. When we add the

interaction to the model, the effect of migration status still keeps its statistical power of explaining the number of symptoms, however it changes its direction. According to the results in Model 3, migration status of the husband is itself negatively associated with the number of symptoms, however when in combination with income it increases the odds of having an additional STD symptom, as the statistically significant coefficient of the interaction term indicates.

The direction of STD transmission. Table 3 summarizes the results of indirect assessment of the direction of the transmission of the STD through women's opinion of husband's infidelity. The control variables are the same for all three models, but the main predictor indicating STDs or its risks are different for each model. In Model 1 the main predictor is dichotomy of having an STD symptom in the last 12 months, the number of symptoms in Model 2 and dichotomy of having a diagnosed STD in last 3 years in Model 3. In all three cases husband's migration status is a significant predictor of women's perception of husband's infidelity and increases the odds of thinking that husband is unfaithful about 10.5 times. This effect is very impressive, however not surprising. Considering the fact that migrants are away many months from their families and the village, which usually provides social control over one's behavior, and, that women might not contact or have any information about their migrant husbands over long periods of time, explains the higher probability of thinking that husband might have had sexual intercourse with another woman among wives with migrant husbands compared to those with non-migrant husbands.

Table 3. Multivariate analysis of woman's perception of husband's infidelity (odds ratios)

Variables in the model	Thinks husband is unfaithful		
	Model 1	Model 2	Model 3
Husband's migration status			
Husband is not a migrant (Ref.)	1.0	1.0	1.0
Husband is a migrant	10.584**	10.575**	10.612**
Woman's age	1.130	1.109	1.133
Woman's age ²	0.998	0.999	0.998
Husband – wife age difference	1.018	1.017	1.019
Woman's education			
Secondary or less (Ref.)	1.0	1.0	1.0
Vocational or higher	0.795	0.807	0.791
Number of children	1.122	1.144	1.128
Co-residence with in-laws			
Does not live with in-laws (Ref.)	1.0	1.0	1.0
Lives with in-laws	1.192	1.195	1.164
Household income (Log)	0.975	0.978	0.910
Had at least one STD symptom in last 12 months	1.647**	-	-
Number of symptoms in last 12 months		1.219**	-
Had an STD at least once in last 3 years			6.835**
Number of cases		1238	

Significance level : ** - $p < 0.01$; * - $p < 0.05$.

The main predictor in all the models has a significant impact on women's opinion. Having had an STD symptom in last 12 months (Model 1) increases the probability of thinking that husband has been unfaithful by about 65% controlling for individual characteristics. When we look at the number of symptoms (Model 2), we can see that husband has been unfaithful by about 22%. Similarly, having had a diagnosed STD has a strong positive association with women's opinion of husbands' infidelity. Women who has been diagnosed with an STD in last 3 years are prone to thinking that husband is very likely to have had sexual intercourse out of marriage in the previous 6 months about 6.8 times more than those with no diagnosed STDs. Therefore, no matter how we measure the risks of STDs, if women are at risk, they are more likely to think that husband has been unfaithful than those who are not at risk.

Conclusion

In the beginning of the discussion of the association between migration and the spread of HIV/STDs the main focus was on the migrant laborers. However, as the epidemic grew and the migration processes became more complicated the focus of interest moved from migrants to their long-term partners. The literature on the latter is not only not comprehensive but also contradictory. While some studies find evidence for the significant association between migration and the spread of HIV among the partners of migrants, others find that multiple partnerships, rather than having a migrant partner, predict the HIV status. Less studied is the spread of the epidemic in the developing countries of the “second wave” of HIV/AIDS. These countries already have a high rate of STDs, which have been found to be strongly associated with HIV, and circular migration.

To add to the literature on the association between STDs and migration this study focused on the association of men’s circular migration and STD/symptoms among women. The results of the analysis found evidence for the positive association between migration and STD/symptoms among women. Women married to migrant laborers are more likely to be diagnosed with an STD or have symptom, than their counterparts married to non-migrants. However, the association is not straightforward. Some of the results of this study indicate that migration itself net of other factors might have a negative effect on the STD symptoms. It might be explained by fewer sexual contacts for the married couples with a migrant partner. However, it turns out, that migrants with higher incomes increase the STD risks for their partners, although, the net effect of income is also negative.

Therefore, high income provides different opportunities for women with migrant and non-migrant husbands. While it might mean better access to the healthcare for women with non-migrant husbands, for migrant's partners it might expose to higher risks of STDs as migrants with higher incomes are more likely to engage in commercial sex or other high risk behaviors than migrants with lower income or non-migrants. These results add to the literature and findings from different studies that migrants are more likely than non-migrants to engage in HIV high risk behaviors (Anarfi, 1993, Brockerhoff and Biddlecom, 1999, Lagarde et al., 2003, Coffee et al., 2005, Mtika, 2007). However, as not all the migrants but those with higher incomes create more risks for their partners, the future studies should pay closer attention to the economic context of migration in regard to STD/HIV.

The direction of the transmission of the diseases has been another controversial issue in the discussion of HIV/STDs and migration. Some studies indicate that partners of migrant laborers are not more likely to be infected, whereas others find evidence for that. Moreover, some studies have found that non-migrant partners of migrant laborers are the ones to be infected with an STD/HIV, while their partners do not carry the disease. To add to the discussion of the direction of the disease vector this study is approaching the issue indirectly. In the study of the association between women's perception of husband's infidelity and their STD/symptoms it was found that women with diagnosed STD or reported symptoms are more likely to believe in husband's unfaithfulness, controlling for migration status of the latter. Thus, we can assume that men are more likely to be responsible for the transmission of the hypothetical or actual disease than their female partners. However, we should be cautious about this assumption as it is based on the

indirect assessment of men's sexual contacts out of marriage. To better understand the direction of the STD transmission and the social context behind it further investigation is needed.

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