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Men's migration and women's fertility in rural Mozambique[*]

Introduction and conceptual approach

Profound and pervasive social changes in sub-Saharan Africa are rapidly reshaping its reproductive landscape. Rural fertility, while still high compared to other parts of the world and to the sub-continent's urban areas, shows signs of decline. Even in rural settings where no decrease in fertility rates is yet noticeable, survey data point to growing desires for postponing births and reducing family size. A major engine driving these changing behavior and intentions is the transformation of rural marriage. Labor migration, a massive and growing phenomenon across the sub-continent, plays a particularly important role in this transformation. As the macroeconomic restructuring underway in most sub-Saharan countries makes material returns to migration less stable and predictable, uncertainties surrounding migrants' marital unions also increase. The HIV/AIDS epidemic, especially in settings where it is most advanced, further undermines traditional marital commitments, expectations, and relationships. Because HIV is widely believed to be contracted and brought to the community by migrants, the perceptions of heightened HIV risks may amplify the strain of marital relationships and misgivings about its prospects and therefore foster further reassessment of childbearing preferences and plans.

The connection between migration and fertility has been extensively studied in sub-Saharan Africa. However, most these studies have focused on fertility of migrating men and women (e.g., Brockerhoff 1995; Brockerhoff and Yang 1994; Chattopadhyay et al., 2006). The effect of male

labor migration on rural fertility has received much less attention in the literature beyond a long-established view that physical separation of spouses due to husbands' migration results in lower fertility (e.g., Bongaarts, Frank, and Lesthaeghe 1984). In this study we first subject the view to statistical scrutiny using retrospective survey data from southern Mozambique. In this exercise, we examine how yearly probability of birth is affected by husband's migration status but, at the same time, look at the effect of labor migration trends at the community level. In the first part of the study we also estimate the effects of migration of lifetime fertility. In the second part of our analysis we use data from the same survey to compare fertility and reproductive preferences of non-migrant rural women married to labor migrants and those married to non-migrants. Specifically, we examine the probability of birth in the past six years and women's intention (not) to have more children, desired number of children, and preferred timing of further childbearing. In the analyses of reproductive preferences, we first look at the former group as a whole and then break it down into two subgroups based on two different definitions of migrant quality: one based on the amount and frequency of remittances and another based on women's assessment of overall impact of husbands' migration on their households. We hypothesize that women married to migrants are more likely to want more children than women married to non-migrants either because of their lower fertility and because continuing reproduction may reduce the risk of marriage dissolution that typically rises with marital partners' separation. However, after controlling for parity, any greater pronatalism of migrants' wives will be associated with "better" quality of migrants: women will be more willing to make reproductive investments in marital relationships with migrants if these relationships yield tangible benefits and security. We test these hypotheses using standard statistical techniques described below. In the concluding section, we bring together the results of the two parts of the analysis to reflect on ways in which labor migration shapes fertility behavior, and more broadly, on how migration both disrupts and ensures reproduction of family and community systems.

Setting

Mozambique is a country of some 20 million people located in southeast Africa. A former Portuguese colony that gained independence in 1975, the country was battered by a civil war for the first decade and a half of its independent existence. Since the war ended in 1992 and the economic structural adjustment programs were deployed in the early 1990s, the country has experienced a remarkable macroeconomic growth. Yet with a per capita annual income of only $290, life expectancy of 40 years, and female literacy rate of 32%, Mozambique remains one of the poorest and least economically developed nations of the world (World Bank 2006).

Two nationally representative Demographic and Health Surveys (DHS), carried out in Mozambique in 1997 and 2003, allow for an assessment of trends in fertility and contraceptive use. Table 1 summaries key fertility and family planning indicators. The table shows that the total fertility rate (TFR) declined considerably between the two surveys only in urban areas, while no comparable change took place in rural areas. In fact, the rural TFR registered a minor increase. Although the TFR data do not offer signs of a fertility decline in rural areas, trends in reproductive intentions and contraceptive use are indicative of a maturing potential for such a decline. Thus modern contraceptive prevalence rate (MCPR) among married rural women, while far below the corresponding rate for urban areas, increased from 2.3% to 7.2% (it should be noted that all contraceptives offered through the National Health Care System are completely free). Even more telling was the change in the percentage of rural women who did not want to have any more children. Although the intentions to stop childbearing stated by survey respondents in sub-Saharan settings are contingent on a variety of conditions and circumstances and are easily changeable (Agadjanian 2005), they do reflect at least a general preference for fertility regulation and the growing "unmet need" for family planning (Casterline and Sinding 2000), and more specifically, for fertility limitation rather than for simply maintaining a certain length of birth intervals.

Table 1 about here

Since colonial times, Mozambicans, especially from the country's south, have worked in South

African mines (CEA/UEM 1997; Crush et al. 1991; First 1983), and this legal migration flow,

established through generations, continues to date (Crush 2001; de Vletter 1998; Harries 1994).

Political and economic changes associated with the civil war and with the subsequent post-

conflict transition have amplified international migration. In particular, a growing number of

seasonal and commuter migrants have been crossing the Mozambique-South Africa border,

largely illegally, after the in the end of the apartheid regime in the early 1990s and the resulting

loosening of border controls between the two countries (Crush 1997). Mozambicans today

constitute the largest migrant group in South Africa (Adepoju 2003).

In parallel to international migration, migration within Mozambique, particularly from rural to

urban areas, has also been growing rapidly. Limited and controlled by the colonial regime, rural-

urban migration, especially to Maputo, Mozambique's capital, increased with Mozambique's

independence and the civil war that soon followed (Dow 1989; Jenkins 1993; Knauder 2000).

After the war, the structural adjustment policies, which further undermined traditional

subsistence agriculture and magnified socioeconomic imbalances, have spurred new migration

flows (Knauder 2000; Wenzel & Bannerman 1995). Importantly, today both internal and illegal

international migratory moves often fall short of fulfilling the promise that generates them, as

migrants rarely manage to secure decently paying jobs at their destinations (De Vletter 2000).

Yet despite the drastically diminished returns, the migration flow continues unabated as rural

economies continue to stagnate.

While the changing migration regimes have been at the root of the transformations of family,

kinship, and gender systems, they have also played a significant role in the HIV/AIDS epidemic

sub-Saharan Africa. Migration has long been implicated as a key factor in the spread of

HIV/AIDS (e.g, Appleyard and Wilson 1998; Decosas et al 1995; Hunt 1989; Lurie 2006).
Although direct evidence connecting migration to HIV/AIDS in Mozambique is lacking, higher
seroprevalence levels around the transportation corridors and aggregate level analyses of
census and sentinel surveillance data (Barreto et al. 2000) indirectly support this connection. In
rural southern Mozambique, HIV/AIDS is widely regarded as a disease brought to local
communities from South Africa by labor migrants, and wives of migrants reveal much stronger
concerns about risks of infection than women married to non-migrants (Agadjanian, Arnaldo,
and Cau 2007).

Data

This study uses data from a study conducted in Southern Mozambique in 2006. The fieldwork
included an individual women's survey, a community survey, and in-depth interviews with
individual survey respondents. The sample for the individual survey was drawn from the
population of married women aged 18-40 residing in 56 villages of four districts in southern
Mozambique. In each district, 14 villages were selected with the probability proportional to size.
In each selected village (or in a randomly picked section thereof if a village was big), all
households with at least one married woman were canvassed and separated into two lists—
those with at least one woman married to migrant and those with no such women. These two
lists were used as sampling frames: from each of them 15 households were randomly selected.
In each selected household a woman was interviewed (in household classified as migrant, a
woman married to a migrant was interviewed). The procedure resulted in a total sample of 1680
women (420 per district, 30 per village), more or less evenly split between women married to
migrants and women married to non-migrants. The survey collected detailed demographic and
socioeconomic information, including pregnancy histories, husband's migration history (starting
in 2000, the year of particularly devastating floods in southern Mozambique), and household

material status, as well as information on HIV/AIDS awareness and prevention, women's social networks, and their gender attitudes. In parallel with the individual women's survey, a community survey was carried out each of the villages included in the sample. The community survey focused on village economic and social life, out-migration, and HIV/AIDS issues.

A subsample of the surveyed women married to migrants participated in in-depth interviews. In all, 72 survey respondents from eight villages (nine per village, eighteen per district) were interviewed. The interviews expanded on issues addressed in the survey, focusing on women's perceptions of how husbands' migration may have affected their relations with husbands, childbearing intentions, HIV/AIDS risks, etc.

Methods

For the analysis of husband's migration on fertility we employ an event-history approach. We test a discrete-time logistic regression model in which a birth in a given year of is the event of interest and husband's migration status in that year is the main predictor (we also test a model in which the effect of migration is lagged by a year). Our husband's migration history data go back approximately six years from the time of the survey (or to the start of marital union if it started less than five years before the survey), and we can only look at that time span. Although this is a limitation of the analysis, it should be borne in mind more recent births tend to be more accurately reported than births that occurred in more distant past. In addition to husband's migration-related absence, we also look at community-level trends in married men labor out-migration. The measure that we use is based on assessment of trends in married men's out-migration from the community in the decade preceding the survey made by community leaders in community survey interviews. Although this measure is impressionistic, we assume that it does reflect general changes in the level of community involvement in male labor migration. These models control for time-varying characteristics such as woman's age, her work outside the home, prior pregnancies, and characteristics that we consider time-invariant for the period

under observation (five years), such as woman's education and religious affiliation reported at the time of the survey. For the analysis of lifetime fertility we fit Poisson regression predicting the total number of children ever born from the husband's migration status and migration trends in community. Because no information on husband's migration before 2000 is available, we use current migration as the predictor. We acknowledge this as a limitation. The controls are women's and household characteristics at the time of the survey.

To examine the links between husband's migration and women's fertility preferences we used different approaches. Thus we focus on women's intentions to have more children vs. not to have more, and preferences to have a (next) child soon (within two years) vs. not to have child soon. Because these approaches produced very consistent results, in this paper we only present the results for intentions to have more children. For predictors, we look at the differences between women married to migrants and those married to non-migrants. We also examine differences in migrant "quality" as measured by the amount and frequency of remittances. We also test other formulations of migrant quality such as those based on women's own perception of the effect of husbands' migration on their households' wellbeing. The models control for age, education, polygyny, household material status, and coresidence with in-laws, among other characteristics.

Because the survey sample was drawn from fifty-six villages and households and women in the same villages may share some unobserved village characteristics that may affect the association of interest, we employ a random-intercept approach, allowing the intercept of an outcome variable to vary randomly by village in all statistical models.

Results

Husband's migration, probability of birth, and lifetime fertility

The results of the event-history models are presented in Table 2. As Table 2 shows, husband's migration was associated with a significantly lower probability of birth in a given year. This result

supports the established view that husband migration leads to lower fertility, mostly likely because of spousal separation and reduction of coital frequency. Interestingly, the effect of trends in migration of married men in community is also statistically significant but it is in the opposite direction: residing in communities with increasing migration outflows is associated with a higher birth probability in a given year. Similarly, when we fit a negative binomial regression model of lifetime fertility (Table 3), husband's current migration status has a significant negative effect: ceteris paribus, wives of current migrants have lower numbers of children ever born. And again, the effect of the trend in married men's labor migration is positive, even thought the corresponding coefficient is marginally significant (the effect slightly strengthens and becomes significant at p<.05 when we use as a continuous variable).

Tables 2 and 3 about here

Husband's migration status and women's reproductive preferences

Tables 4 through 7 displays the results for desire to have more children—wants to have more children vs. does not want or unsure (we also fitted models for desire to stop childbearing— wants no more children vs. other—and these produced results that are similar to the ones we present here). The first column in Table 4 reports the odds ratio for the baseline model that includes husband's migration status as the only predictor. The second column shows the results for a comprehensive model (for this presentation, we omit any intermediate models). The baseline line model demonstrates that women married to migrants are significantly more likely to wish to continue childbearing that women married to non-migrants. The comprehensive model, however, shows that much of this effect is due to other factors: after the controls are added the difference between the two groups is only marginally significant. The analysis also indicates that both biological factors (age, number of children) and socioeconomic and cultural factors are equally important mediators of the effects of husband's migration status.

8

Table 4 about here

Next, we look more closely at the factors that shape the fertility intentions. Table 5 presents the results of two logistic regression models—one for women married to migrants and another for women whose husbands are not migrants. Both models include the same sets of predictors. As we can see, however, there are important and instructive differences in the effects of some of these predictors. Most notably, among women married to migrants neither polygyny nor woman's knowledge/suspicion of husband's extramarital sex have any effect. In contrast, among non-migrants' wives, both polygyny and perceived husband's infidelity tend to significantly discourage further childbearing. These differences imply a more tolerant attitude toward both polygyny and extramarital sex among women married to migrants. Because both polygyny and extramarital sex may be viewed by women as forms of resource sharing— formalized in the case of polygyny and informal in the case of extramarital affairs—it can be suggested that women married to migrants are more accepting of sharing resources generated by migrant husbands with other women—either because they expect these resources to be abundant enough or because polygyny and extramarital sex are more normative among migrant men than among non-migrant men.

Table 5 about here

We then turn to the issue of "quality of migrant." Two approaches are tested. The first approach is based on amount and frequency of remittances. Using these criteria we subdivide the migrant sub-sample into two groups: women married to "better" migrants (remit and/or bring money regularly) and women married to "worse" migrants (irregular or no remittances). The results of the logistic regression models using this classification (women married to non-migrants are the

9

reference group) are presented in Table 6. We also test an alternative specification of the quality of migrant husbands—one that is based on women's answers to the question on whether the living conditions of their households improved since their husbands went into migration. Under this approach, women who acknowledge improvement are defined as married to "better" migrants, whereas women who do not are classified as married to "worse" migrants (women married to non-migrants are the reference). The results of the corresponding logistic regression models are presented in Table 7.

Table 6 and 7 about here

In Table 6, both groups of women married to migrants are more likely to want more children than women married to non-migrants when no other factors are taken into account. When these factors are controlled for, the effects of husband's migrant quality diminish and remain marginally significant only in the case of women married to "better" migrants. The results in Table 7 are notably different. First, even though in the baseline model both being married to a "better" migrant and being married to a "worse" migrant significantly raise the odds of wanting another child, relative to being married to a non-migrant, there is an appreciable difference in the effects of the two types of migrants. Moreover while the effect of "worse" migrant disappears with the addition of controls, the effect of "better" migrant, while diminishing in magnitude, remains significant at $p<.05$. Because childbearing desires are subjective preferences, they may be more responsive to women's subjective assessment of the impact of husbands' migration on their lives rather than to such objective measures as amount and frequency of remittances. The results presented in Table 7 support our hypothesis by clearly demonstrating that it is the perceived benefits of migration that affect women's reproductive desires rather than the fact of husband's migration per se, as Table 4 might suggest.

Conclusion

Labor migration is typically seen in demographic research as reducing exposure to conception and disrupting childbearing. To some, this view fosters a more general conclusion about disruptive effects of migration on the family and community. Our study started with a similar general premise, but the results have suggested two important corrections. First, in settings where the tradition of labor migration is well established and livelihoods of a large segment of the population are dependent on migration remittances, the disruption caused by migration is part of normal life course trajectories and in this sense is *normative.* While migrant husband's absence does lead to wife's lower probability of birth and is cumulatively manifested in lower lifetime fertility, the aggregate levels of migration are positively associated with both the probability of birth and (somewhat less convincingly) parity. Although specific pathways through which aggregate migration trends may increase individual fertility would require a special investigation, we can speculate here that this effect has to do with how migration and its economic benefits strengthen—rather than strain—the family system and the broader social fabric of the community. This cementing role of migration has its limits, however, and this is where our study makes another correction to the commonly held views. Although migrants' wives are more likely to desire more children than non-migrants wives, this greater "pronatalism" is conditioned on the "quality" of migrant. Moreover, rather than some objective measures of husband's contribution to household's wellbeing, it is wife's subjective assessment of the impact of husband's migration on household's material conditions that makes a difference. A more positive assessment of husband's migration outcomes for the household leads to stronger desires to continue childbearing, arguably by instilling greater optimism about the future and/or greater need for retaining husband's attention and therefore the flow of migration-generated benefits. In comparison, migrants' wives who do not see improvements in their household wellbeing as a result of migration may not be, ceteris paribus, any more motivated to continue childbearing than women whose husbands are not migrants.

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Table 1. Fertility and Contraception in Mozambique, MDHS 1997 and 2003

	Mozambique DHS	
	1997	2003
TFR	5.6	5.5
TFR Rural	5.8	6.1
TFR Urban	5.1	4.4
MCPR, married women, urban	16.6	23.2
MCPR, married women, rural	2.3	7.2
Percent of married rural women wanting no more children, by number of living children		
0	1.1	1.0
1	0.8	4.1
2	5.9	9.5
3	13.5	17.6
4	16.7	24.6
5	38.6	40.6
6+	52.6	58.8

Table 2. Discrete-time hazard model of rate of childbirth from 2000 until 2006

	Odds Ratios	
Husband currently away	0.82**	0.80**
Wife currently works outside the home		1.11
Prior number of pregnancies		1.02
1-4 Years education (less than 1 is reference)		1.24**
5+ Years education (less than 1 is reference)		1.31**
Mainline church		1.26*
Zionist or other Pentecostal church		1.19+
Baseline hazard (reference is less than 20)		
Age 20-24	1.31**	1.32**
Age 25-29	1.24*	1.24+
Age 30-34	0.81+	0.78+
Age 35+	0.39***	0.36***
Number of married migrants increased in past 10 years		1.18*
-2LL	20956.1	21028.37
Person Years	4676	4674

Note: + p<.1, * p<.05, ** p<.01

Table 3. Poisson regression model predicting number of live births

	Odds Ratios	
Husband is migrant	0.81***	0.93*
Age 21-25		1.78***
Age 26-30		2.91***
Age 31 plus		4.22***
In polygynous marriage		0.96
Bridewealth has been paid in full		1.06+
At least one co-resident in-law		0.94+
1 to 4 years of education		1.04
5 years of education or more		0.97
Household material possession index		0.98
Thached roof		1.05
HH has electricy from any source		1.02
HH owns cattle		1.01
Mainline church		1.12*
Zionist or other Pentecostal church		1.08+
Husband beat her up at least once		1.10**
Number of married migrants increased in past decade		1.06+
-2LL	3644.99	2991.8
Number of Cases	1677	1671

Note: + p<.1, * p<.05, ** p<.01

Table 4. Logistic regression predicting desire to have more children, husband's migration status as main predictor

	Odds Ratios	
Husband is migrant	1.76***	1.27+
Age 21-25		1.01
Age 26-30		0.75
Age 31 plus		0.50*
Number of living children		0.54***
In polygynous marriage		0.65**
Bridewealth has been paid in full		0.81
At least one co-resident in-law		1.08
1 to 4 years of education		0.96
5 years of education or more		0.90
Household material possession index		1.04
Thatched roof		0.86
HH has electricity from any source		1.67*
HH sells at least part of harvest		0.93
HH owns cattle		1.17
Mainline church		0.81
Zionist or other Pentecostal church		0.91
Knows/suspects husbands has mistress		0.71*
Husband beat her up at least once		0.97
-2LL	7388.91	8087.43
Number of cases	1677	1671

Note: + p<.1, * p<.05, ** p<.01

Table 5. Logistic regression predicting desire to have more children, estimated separately by husband's migration status

	Odds Ratios	
	Not Migrant	Migrant
Age 21-25	1.62	0.46
Age 26-30	1.11	0.35*
Age 31 plus	0.75	0.22**
Number of living children	0.53***	0.56***
In polygynous marriage	0.58**	0.81
Bridewealth has been paid in full	0.76	0.93
At least one co-resident in-law	0.89	1.44
1 to 4 years of education	1.02	0.83
5 years of education or more	1.19	0.67
Household material possession index	1.03	1.02
Thatched roof	0.91	0.78
HH has electricity from any source	1.60+	1.73+
HH sells at least part of harvest	0.94	0.86
HH owns cattle	1.16	1.20
Mainline church	0.97	0.53
Zionist or other Pentecostal church	0.98	0.69
Knows/suspects husbands has mistress	0.61**	0.87
Husband beat her up at least once	0.90	1.14
-2LL	4700.17	3459.45
Number of Cases	984	687

Note: + p<.1, * p<.05, ** p<.01

Table 6. Logistic regression predicting desire to have more children, husband's migration status, differentiated by better or worse, based on remittances

	Odds Ratios	
Husband is better migrant	1.73***	1.27+
Husband is worse migrant	1.90**	1.26
Age 21-25		1.01
Age 26-30		0.75
Age 31 plus		0.50*
Number of living children		0.54***
In polygynous marriage		0.65**
Bridewealth has been paid in full		0.81
At least one co-resident in-law		1.08
1 to 4 years of education		0.96
5 years of education or more		0.90
Household material possession index		1.04
Thatched roof		0.86
HH has electricity from any source		1.67*
HH sells at least part of harvest		0.93
HH owns cattle		1.17
Mainline church		0.81
Zionist or other Pentecostal church		0.91
Knows/suspects husbands has mistress		0.71*
Husband beat her up at least once		0.97
-2LL	7390.34	8088.43
Number of Cases	1677	1671

Note: + p<.1, * p<.05, ** p<.01

Table 7. Logistic regression predicting desire to have more children, husband's migration status, differentiated by better or worse, based on woman's assessment of impact of migration

	Odds Ratios	
Husband is better migrant	1.93***	1.59**
Husband is worse migrant	1.61***	1.05
Age 21-25		0.99
Age 26-30		0.74
Age 31 plus		0.49**
Number of living children		0.54***
In polygynous marriage		0.67**
Bridewealth has been paid in full		0.80+
At least one co-resident in-law		1.07
1 to 4 years of education		0.95
5 years of education or more		0.89
Household material possession index		1.03
Thatched roof		0.87
HH has electricity from any source		1.61*
HH sells at least part of harvest		0.93
HH owns cattle		1.17
Mainline church		0.80
Zionist or other Pentecostal church		0.91
Knows/suspects husbands has mistress		0.71**
Husband beat her up at least once		0.97
-2LL	7397.23	8152.23
Number of Cases	1678	1672

Note: + p<.1, * p<.05, ** p<.01