Migration, local context and contraception use in urban areas

Extended Abstract

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Introduction

The African continent is one of the regions of the world with the highest urban growth (Beauchemin, 2011). An important part of the African urban population growth is driven by rural-to-urban migration (Brockerhoff, 1995). The reproductive behavior of rural-to-urban migrants, particularly the use of modern methods of contraception has consequences for the pace of fertility change in urban areas (Jensen & Ahlburg, 2004; Lindstrom & Hernández, 2006). The literature typically seeks to explain the relationship between rural-to-urban migration and contraceptive use following three hypotheses (Goldstein & Goldstein, 1983; Hervtiz, 1985; Jensen & Ahlburg, 2004).

The selectivity hypothesis claims that rural-to-urban migrants are a selected group in terms of unobserved and observed characteristics such as age, education and marital status that make rural-to-urban migrants use of contraception more similar to that of the population in urban areas of destination. The disruption hypothesis argues that shortly after migration, an interruption in the supply of contraceptives can lower rural-to-urban migrants' use of contraceptives (Jensen & Ahlburg, 2004). Finally, the adaptation hypothesis states that rural-to-urban migrants will gradually adapt to a pattern of higher use of modern contraceptives typical of urban areas. One question less explored in the literature is how the destination context influences the adaptation process of rural-to-urban migrants.

In this study we investigate how the community context of urban destination areas shapes rural-to-urban migrants' use of modern methods of contraception in Mozambique. Mozambique, a country of southern Africa with 24 million inhabitants, typifies most African countries with higher rural-to-urban migration and diverse living conditions in urban areas. Despite slight decline of total fertility in urban areas from 5.1 in 1997 to 4.5 in 2011, total fertility rate in urban areas remains high in Mozambique (MISAU, INE & ICFI, 2013:75). In rural areas, total fertility rate in Mozambique has increased from 5.8 in 1997 to 6.6 2011 (MISAU, INE & ICFI, 2013:75).

In Mozambique, the use of modern methods of contraception is low. In 2011, the proportion of women married or in union using modern methods of contraception in Mozambique was 21% in urban areas and 7% in rural areas (MISAU, INE & ICFI, 2013:99). At the same time, the urban population in Mozambique has increased from 9% in 1975 (United Nations, 2010:39) to 30% in 2007 (INE, 2010). In 2005, about 80% of urban population in Mozambique was in informal settlements lacking many basic living services (UN-Habitat, 2008). Understanding how the context shapes rural-to-urban migrants' use of modern contraceptives in urban settings may have implications for the development of local level efforts to promote reproductive health of migrants in urban areas.

Background

It has been argued that "where you are" and "who you are" influences health outcomes (Macintyre & Ellaway, 2003). Indeed, in later nineteenth century, Durkheim showed that rates of suicide varied from place to place and that differences in social context were responsible for differing rates of suicide between places (Yen & Syme, 1999). There are two main ways of explaining effects of place on health outcomes. On the one hand, there is the notion that geographical patterning of health outcomes is due to clustering of individuals with similar attributes, such as level of education, shared norms, traditions, etc. (Bernard et al, 2007; Macintyre, Ellaway & Cummins, 2002; Cummins et al., 2005). This perspective argues that the association between place and health outcomes is related to shared attributes among place's residents (Bernard et al., 2007).

On the other hand, there is the idea that there are place's physical and social opportunity structures that shape health experiences of whole groups over and above the influence of aggregate attributes of individuals (Bernard et al, 2007; Macintyre, Ellaway & Cummins, 2002; Cummins et al., 2005). Several researchers have argued that both

ways of explaining effects of places on health outcomes are relevant (Macintyre, Ellaway & Cummins, 2002; Macintyre & Ellaway, 2003; Cummins et al., 2007). A limitation in the literature about the effect of community context on health is the scarcity of studies that investigate mechanisms through which community context may influence health behaviors such as the use of modern methods of contraception (Macintyre & Ellaway, 2000; O'Campo, Salmon & Burke, 2009). The investigation of pathways through which community context may influence health outcomes deserves further investigation. With respect to the use of modern method of contraception by recent rural-to-urban migrants possible pathways might include: (1) accessibility to contraceptive-related information; (2) community socioeconomic status; (3) contraception-related behaviors; and (4) accessibility and quality of family planning services. The circumstances in urban settings may affect the possibility of recent rural-to-urban migrants' using contraceptives. Brockerhoff (1995) has argued that recent migrants in urban areas might not use contraception due to various factors as the lack of information about sources of contraceptives and lack of financial resources to pay for services.

Hypotheses
Based on the above literature we make several predictions. Firstly, we predict that rural-to-urban migrants will be lesser users of modern methods of contraception than non-migrants. However, differences between rural-to-urban migrants and urban non-migrants are expected to disappear over time. Secondly, we expect that rural-to-urban migrants residing in communities of greater access to contraceptive-related information will be more likely to use modern methods of contraception than their counterparts. Thirdly, rural-to-urban migrants residing in communities characterized by higher levels of community socioeconomic status will be more likely to use modern methods of contraception. Fourthly, we expect rural-to-urban migrants in communities of greater aggregate levels of contraception-adverse behaviors, such as polygyny, to be lesser users of modern methods of contraception than their counterparts. Finally, residing in communities of greater family planning quality is expected to be positively associated with rural-to-urban migrants' use of modern methods of contraception.

Data and Methods
 Data
Although the recent Demographic and Health Survey (DHS) in Mozambique was in 2011, this dataset lack relevant migration questions. The 2011 Mozambique's DHS survey did not collect information about the duration of stay in the current place of residence (MISAU, INE & ICFI, 2013). Thus, in this study we use data from the 2003 Mozambique's DHS. This is a nationally representative, probabilistic sample selected in three stages, involving the selection of primary sampling units, the selection of enumeration areas in each primary sampling unit, and the selection of family households in each enumeration area. Women aged 15-49 years were selected and interviewed from the chosen households. The survey collected detailed retrospective data on reproductive and health information of women in Mozambique, including on knowledge and use of family planning methods. The response rate for women was 90.9 per cent (INE, MISAU & ORC Macro, 2005). Of the 12,418 surveyed women, we use an analytic sample of 3410 women who were residing in urban areas. Of these women, 772 were migrants and 2638 non-migrants. Pregnant and infecund women resident in urban areas did not include the analytic sample as they were considered not at risk of using modern methods of contraception. As we were interested in the effect of community context on the use of modern methods of contraception by recent rural-to-urban migrants, rural-to-urban migrants with six or more years in urban areas were considered as non-migrants (together with urban-natives and urban-urban migrants).

Measures

Use of a modern method of contraception is a dichotomous measure indicating whether an eligible woman aged 15-49 years was using a modern method of contraception at the time of the survey. This is the study outcome measure.

Migration status is a dichotomous variable that divides women into migrants and non-migrants. Migrant women were further divided according to duration of stay in urban areas of destination into those who were in urban areas for less than 3 years and those who had 3 or more years in urban areas. In this study, four mechanisms through which community context may influence rural-to-urban migrants' use of a modern method of contraception were hypothesized. These mechanisms are: (1) accessibility to contraceptive-related information; (2) community socioeconomic status; (3) contraception-related behaviors; and (4) accessibility and quality of family planning services. To measure these mechanisms, community-level predictor variables were created by averaging individual-

level data to the enumeration area (representing a community), using all surveyed women where possible. The predictor variables of interest are indicated as follows.

Access to contraceptive-related information. Measures of access to contraceptive-related information considered in this study are the percentage of women exposed to family planning messages in the community and the percentage of women who discussed family planning with others in the community. Women were asked whether in the 6 months prior to the survey, they heard about family planning from any of the following sources: on the radio, on the television, in a newspaper or magazine. Responses to these questions were used to compute the percentage of women exposed to family planning messages in the community. The computing of the percentage of women who discussed family planning with others in the community was based on a question that asked women whether in 6 months before the survey they discussed family planning with any of the following people: husband or partner, mother, father, sister(s), brother(s), aunt/uncle, daughter(s), mother-in-law, health personal, medical doctor, teacher, friends or neighbors, priest, other person. *Community socioeconomic status*. To measure community socioeconomic status the following variables of interest were considered: (1) Mean years of education in the community, (2) the percentage of richer households in the community. The mean years of education of women in the community was calculated by averaging years of schooling of women in the enumeration area. The computing of the percentage of rich households in the community is based on averaging households classified as rich according to the DHS wealth index.

Contraception-related behaviors. The percentage of women in the community in polygynous marriages and the mean number of children ever born in the community are two variables that were used to assess effects of contraception-related behaviors. A woman that was married or in union at the time of the survey was asked whether she was in a polygynous union and the number of other wives her husband or partner had. Responses to this question were used to compute the percentage of women in the community in polygynous marriages. The community's mean number of children ever born was computed by averaging individual women's number of children ever born in the enumeration area. Finally, to measure *the accessibility and quality of family planning services*, the percentage of women in the community that reported that having to take transport is a major problem for getting medical help for themselves and the percentage of women in the community visited by a family planning worker in the 12 months prior to the survey were used.

Individual-level variables. Individual-level variables that are likely to be associated with migrants' use of a modern method of contraception were considered as controls. These include women's age (coded as: 15-19, 20-29, 30-39, 40-49, with age 20-29 years as reference), women's number of children ever born (categorized as: 0, 1-2, 3-4, 5-6, 7 or more, with 1-2 children as reference). Marital status has two categories, married or in union (reference) and not married. Another controlling variable is women's exposure to family planning messages. A woman was coded as exposed to family planning messages if she answered affirmatively that she has heard about family planning in few months prior to the survey on the radio, or on the television, or in a newspaper or magazine (those who replied "no" are considered as reference). A woman's discussion of family planning with others was coded as "yes" if she answered that in 6 months before the survey she discussed family planning with any of the following: husband or partner, mother, father, sister(s), brother(s), aunt/uncle, daughter(s), mother-in-law, health personal, medical doctor, teacher, friends or neighbors, priest, other person. Those who replied "no" are considered as reference. Household socioeconomic status is another control variable. This has two categories, rich household or not rich household (reference) based on the DHS Wealth Index. Finally, woman's level of education was considered as control. Woman's education is a dichotomous variable coded 1 if a woman has some level of education and 0 if has no education (reference).

Analysis
Community-level and individual-level data were used to fit random intercept logistic regression models in Stata Version 11 (StataCorp, 2009). First, we estimate the effect of being recent migrant in urban areas on the use of modern methods of contraception net of individual factors. Second, we disaggregate recent migrants according to the duration of stay in urban areas and we assess the effect of being in each group on the use of modern methods of contraception net of individual factors. Third, we examine effects of community-level characteristics net of individual-level factors.

Preliminary Results
Table 1 shows the descriptive statistics of the study sample. Table 1 indicates that 35% of women were using a modern method of contraception at the time of interview (migrants and non-migrants).
About twenty three percent of women were migrants. Of these, 13% were migrants for less than 3 years and about 10% were migrants for 3 or more years. Almost two thirds of women in the sample were aged 15 to 29 years and close to half of women were married or in union. More than half of women in the sample tended to have some education, to have been exposed to family planning and to live in households considered to be relatively wealthy.

[Table 1 about here]

Table 2 presents random intercept logistic regression results of modern contraceptive use in Mozambique by migration status. The results are shown as odds ratio. Model 1 is a baseline model assessing the effect of being a migrant on the use of modern method of contraception. As would be expected, rural-to urban migrants are significantly less likely to use modern methods of contraception than non-migrants. When we add individual control variables in Model 2, the migrants' odds of using modern methods of contraception continue to be significantly lower (OR=0.83, p<.1). In Model 3 we examine the effect of duration of residence in urban areas. We find that migrants with less than 3 years in urban areas are 32% less likely to use modern methods of contraception than non-migrants. For migrants with 3 or more years in urban areas the odds of using modern methods of contraception are not significantly different from those of non-migrants. After adding individual controlling variables we find similar results (Model 4). The findings in Models 3 and 4 appear to support the adaptation hypothesis.

[Table 2 about here]

Next, we examine the effect of community characteristics on the use of modern methods of contraception controlling for individual-level factors (Table 3). First, we consider all migrants (Model 1-4) and then migrants disaggregated by the duration of stay in urban areas (Model 5-8). Model 1 assesses the effect of access to contraception-related information on the relationship between migration and contraception use. The findings show that a woman living in a community with higher percentage of women who discussed family planning with others is significantly more likely to use modern methods of contraception than her counterpart net of individual level factors (OR=1.02, p<.05). The level of women in the community exposed to family planning does not have a significant effect of the use of modern methods of contraception.

[Table 3 about here]

In Model 2 we add measures of community household socioeconomic status. As expected, we find that living in a community with higher level of female education increases the odds of using modern methods of contraception by 25% and living in a community where richer households are common has a significant positive effect (OR=1.95, p<.0.5). When adding community measures of contraception-related behaviors (Model 3) we find that the proportion of women in the community in polygynous marriages and the mean level of children ever born in the community have a significant negative effect controlling for individual factors. In Model 4, we add measures of accessibility and quality of family planning services and we find that residing in a community where a larger percentage of women consider that having to get transport is a major problem preventing them from getting medical help for self has a significant negative effect on the use of modern methods of contraception. The results in Models 5-8 when we disaggregate migrants according to the duration of stay in urban areas are similar to those presented in Models 1-4 (Table 3). Overall, Table 3 shows that in urban areas of Mozambique, migrants have disadvantages in using modern methods of contraception than non-migrants. The disadvantage is particularly felt by recent urban migrants (those in urban areas for less than 3 years). Table 3 also suggests that the context of migrants' receiving areas in urban areas of Mozambique is important in shaping migrants' use of modern methods of contraception.

Next Steps
To improve the paper we will strengthen the background literature about the effect of community context on the relationship between rural-to-urban migration and contraceptive use, and we will refine our models and analysis.

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Table 1. Descriptive Statistics of the Sample (N=3410)

	Averages
Outcome Variable	
Uses a modern method of contraception	34.9%
Predictor Variables	
Non-migrant	77.4%
Migrant	22.6%
Migrant for less than 3 years	13.1%
Migrant for 3 or more years	9.6%
Age	
15-19	28.5%
20-29	37.1%
30-39	21.4%
40-49	13.1%
Parity	
0	31.1%
1-2	32.2%
3-4	17.1%
5-6	11.0%
7 or more	8.6%
Currently married or in union	49.1%
Some education	87.0%
Exposed to FP	64.7%
Discussed FP	40.5%
Women in a rich household	69.9%

	Averages
Outcome Variable	

Table 2. Random intercept logistic regression results of a migrant woman's use of modern method of contraception, 2003 Demographic and Health Survey, Mozambique (Odds Ratio)

Variable	Model 1	Model 2	Model 3	Model 4
Migration Status				
Non-Migrant (Ref.)	1	1	1	1
Migrant	0.81*	0.83†	NA	NA
Cumulative Years of Migration				
Less than 3 Years	NA	NA	0.68**	0.70**
3 to 5 Years	NA	NA	1.01	1.04
Woman's age				
20-29 (Ref.)		1		1
15-19		0.64**		0.65**
30-39		0.61**		0.61**
40-49		0.69*		0.68*
Woman's parity				
1-2 (Ref.)		1		1
0		0.89		0.88
3-4		1.36*		1.37*
5-6		1.77**		1.77**
7 or more		1.52*		1.53*
Marital status				
Married or in Union (Ref.)		1		1
Not married		1.27*		1.28*
Woman exposed to FP				
No (Ref.)		1		1
Yes		1.27*		1.22*
Woman discussed FP with others				
No (Ref.)		1		1
Yes		1.83**		1.84**
Woman's level of education (years)				
No Education (Ref.)		1		1
Some education		1.97**		1.95**
Household SES				
Not Rich (Ref.)		1		1
Rich		2.42**		2.43**
Intercept	0.48**	0.10**	0.48**	0.10**
Community-level random intercept (standard errors)	0.76 (0.07)*	0.45(0.07)*	0.77(0.07)*	0.45(0.07)*
Log Likelihood	-2132.46	-2016.92	-2129.56	-2014.16
N	3410	3410	3410	3410

Notes: †- p<0.1; *- p≤ 0.05; **- p≤ 0.01; FP=Family Planning; SES= Socioeconomic status; NA = Not Applicable.

Table 3. Odds Ratio of a woman's use of modern method of contraception by migration status and community characteristics, 2003 Demographic and Health Survey, Mozambique

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Migration Status								
Non-Migrant (Ref.)	1	1	1	1	1	1	1	1
Migrant	0.82*	0.84†	0.83*	0.83†	NA	NA	NA	NA
Cumulative Years of Migration								
Less than 3 Years	NA	NA	NA	NA	0.69**	0.70**	0.70**	0.70**
3 to 5 Years	NA	NA	NA	NA	1.02	1.04	1.02	1.03
COMMUNITY-LEVEL VARIABLES								
Accessibility to contraception-related information								
% of women exposed to FP messages	0.61				0.61			
% of women who discussed FP with others	1.02**				1.02**			
Household SES								
Mean years of female education		1.25**				1.25**		
% of rich households		1.95**				1.98**		
Contraception-related behaviors								
% of women in polygynous marriages			0.04**				0.05**	
Mean number of children ever born			0.71**				0.71**	
Accessibility and quality of FP								
% say having to take transport is major problem for getting medical help for self				0.51*				0.51*
% of women visited by FP worker				2.04				2.05
Community-level random intercept (standard errors)	0.40(0.07)*	0.30(0.07)*	0.37(0.07)*	0.45(0.07)*	0.41(0.07)*	0.30(0.07)*	0.37(0.07)*	0.45(0.07)*
N	3410	3410	3410	3410	3410	3410	3410	

Notes: †- p<0.1; *- p≤ 0.05; **- p≤ 0.01; HF=Health facility; FP=Family planning; SES= Socioeconomic status.

Controls: Age, Parity, Marital Status, Education, Exposure to FP, Discussion of FP and Household SES.