

Patterns of fertility preferences and contraceptive behavior over time: An examination of change and continuities among the urban poor in Nairobi, Kenya.

Donatien Beguy, Blessing Mberu and Jean-Christophe Fotso

1. Introduction

Kenya is among the first countries to have experienced fertility decline in sub-Saharan Africa (SSA). This has been evidenced in urban areas where populations have benefited from urbanization and modernization, and among most educated groups. Overall, the Total Fertility Rate (TFR) decline was steeper in urban areas, decreasing from 3.1 in 1998 to 2.9 in 2008/09. In rural areas, it remained unchanged at 5.2 children per woman during the same period.^{1,2}

At the same time, modern contraceptive use has steadily increased in the country, with the prevalence being higher in urban areas. Recent findings from the 2008/09 KDHS indicate that 47% of married women living in urban areas were using modern contraceptive method as compared to 37% for their rural counterparts. However, a significant proportion of Kenyan women experience unmet need for family planning despite their high level of contraceptive use. Indeed, the proportion of fecund married women who do not want to be pregnant but are not using family planning methods was estimated at about 25% in 2008/09. For women living in urban areas, the percentage of unmet need of family planning was about 20% in 2008/09. In addition, unintended childbearing is high among women in Kenya; the proportion of unwanted or mistimed births was estimated at 43% in 2008/09. Findings from the recent KDHS also indicate that the gap between wanted and observed fertility is greatest among poor women such as those living in urban slum settlements.

Evidence showed that slum residents of Nairobi exhibit significant disadvantages with respect to living conditions, morbidity^{3,4}, access to health services including family planning services³⁻⁹, mortality¹⁰⁻¹², sexual violence and risky sexual practices¹³⁻¹⁵ relative to other population sub-groups, including rural residents¹⁶. Living in such environments may limit women's ability to control their fertility and implement their fertility preferences. For example, in Korogocho and Viwandani slums in Nairobi city, almost half (47%) of the pregnancies are unintended. Also, for about a quarter (28%) of postpartum months where the risk of another pregnancy is high, no contraceptive method was used by women in the two slums¹⁷.

This study seeks to investigate the association between fertility preferences and contraceptive use among women living in two poor urban settings in Nairobi city – Korogocho and Viwandani slums. The impact of reproductive preferences on contraceptive behavior is of programmatic importance if it is evidenced that contraceptive use is a result of women's fertility intentions. For example, it is expected that women who want to limit childbearing will start using contraceptive methods and most likely permanent methods. In SSA where this question of the interrelationship between fertility preferences and subsequent contraceptive behavior is of paramount importance, very few studies have given appropriate attention to it. Actually, due the scarcity of longitudinal data which are most appropriate for exploring this type of relationship, very little has been done on the topic in the region.

In this study, we take advantage of the longitudinal data collected under the Maternal and Child Health (MCH) component of the Urbanization, Poverty and Health Dynamics (UPHD) project that APHRC conducted between 2006 and 2010 in two informal settlements in Nairobi city, Kenya – Korogocho and Viwandani. The UPHD project is nested into the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) that APHRC runs in the two slums since 2002.

2. Method

2.1. Sample data

The MCH paney survey is an open cohort stuty which started by recruiting all resident women in the NUHDSS area who gave birth since September 2006. Data collection in the MCH benefited from the rich socio-demographic data that has been collected since 2002 under the NUHDSS from all the women that have been living the two NUHDSS sites. The first cohort was recruited between February and April 2007, and was followed afterwards by additional cohorts during each follow-up visits. Information on previous cohorts of mothers was updated at every subsequent visit every 4 months. In total, 5,345 women had been recruited into the study by the end of October 2010. Swahili, the *lingua franca* in the two slum settlements was the language of interview.

The questionnaire used includes several modules on antenatal, delivery and postnatal care, child health, child morbidity, feeding practices, vaccination, postpartum period and sexual activity, and anthropometric measurments. In addition, an exposure calendar was also administered to collect details of reproductive events such as breastfeeding practices, postpartum abstinence, postpartum amenorrhea, sexual activity, contraceptive use in a month-to-month calendar format since the birth of the index child.

For this paper, analysis was first restricted to women from seven cohorts enrolled between February 2007 and January 2010. Actually, only married women aged 15-49 who had at elast one living child at the time of their recruitment in each cohort were considered in the analysis. Women who were sterilized when interviewed were excluded from the analysis. To note, for the first cohort recruited, only women who have not begun sexual relations since birth were asked about their fertility preferences. This resulted into 3569 women being eligible for the analysis in this paper (Table 1).

2.2. Measures

The key outcome variable defined for analysis is contraceptive use (Yes/No) over time. The second outome is type of contraception (modern vs. non modern). The main independent variable is fertility preference measure through desire for additional children. During the survey, respondents who are not pregnant at the moment of interview were asked the following question: “Would like to have another child, or would you prefer not to have any more children?” For those who were pregnant, the question was “After the child you are expecting now, would you like to have another child, or would you prefer not to have any more children?” Answers to those two

questions were used to derive desire for additional children which has two categories: wanting more, not wanting more, and uncertain. Other variables include sociodemographics such as age group, slum residence, education level, ethnic group, and parity. Age group has three categories: 15-24, 25-34 and 35-49. Slum residence is divided into Korogocho and Viwandani. Educational attainment is divided into six categories: no education, primary education, secondary or higher education. Ethnicity comprises seven groups – Kikuyu, Luyha, Luo, Kamba, and a combined group of other ethnic groups.

2.3. Analytic approach

Multivariate regression analyses are employed to estimate the effect of fertility preferences on contraceptive use over time. The variable on fertility preferences is used here as the key predictor whose robustness and statistical significance are assessed while controlling for other possible factors associated with contraceptive use in the literature. Given that the outcome variable is binary and the longitudinal nature of the data, we used a random-intercept logistic regression model that fully take into account the repeated nature of the observations per woman, thus controlling for the correlation of the repeated observations on women. The random-intercept represents the combined effect of all unobserved individual-level covariates that lead some individuals to be more likely to use contraception than others. Given that we have multiple observations for the same woman over time, the factors associated with contraceptive use for woman *i* at time *t* may be related to her chances of contraceptive use at other times.

3. Results

Sample characteristics

Table 1 displays the characteristics of the women who had at least one living child and who were recruited during the observation period. About 82% of women aged 15-24 did not want more children; this percentage is 16% among those aged 35-49. There is not much difference based on education with respect to fertility preferences. About two-thirds for each level of education want additional children. In general, women with larger family size want to limit their childbearing. About two-thirds of women who had at least four living children did not want to have more children; this percentage is 47% among those with three children and 25% among those with two children.

Table 1. Descriptive statistics on the women interviewed between 2007 and 2010

Socio-demographics	Fertility preferences			Total	N
	Want more children	Want no more	Uncertain		
Study site					
Korogocho	65.7%	31.9%	2.3%	100.0%	1,769
Viwandani	65.6%	32.8%	1.6%	100.0%	1,800
Age group					
15-24	82.0%	16.3%	1.7%	100.0%	1,880
25-34	53.1%	44.9%	2.0%	100.0%	1,431
35-49	16.3%	80.6%	3.1%	100.0%	258
Ethnic group					
Kikuyu	62.7%	36.0%	1.4%	100.0%	809

Luhya	63.9%	33.5%	2.6%	100.0%	626
Luo	63.6%	34.7%	1.7%	100.0%	698
Kamba	65.6%	33.2%	1.2%	100.0%	780
Other	73.3%	23.5%	3.2%	100.0%	656
Education level					
Never attended school	67.0%	30.0%	3.1%	100.0%	227
Primary	65.4%	32.8%	1.8%	100.0%	2,507
Secondary & +	66.2%	31.7%	2.0%	100.0%	835
Parity					
One child	96.8%	2.7%	0.6%	100.0%	1,048
Two children	72.5%	25.4%	2.2%	100.0%	1,017
Three children	49.2%	47.3%	3.5%	100.0%	666
Four & plus	31.6%	66.2%	2.1%	100.0%	838
Total	65.7%	32.4%	1.9%	100.0%	3,569

Fertility preferences

Table 2 displays the transition probabilities for fertility preferences for all women, and by age group. Overall, the majority of women who want more children keep their preference (72%), and 24% of them change their preference and report not wanting any more children in subsequent waves. On the other hand, 42% of women who wanted no more children changed their preference and reported that they want more children; about half (52%) did not change their preference.

Patterns of fertility preferences change across age groups. For example, among the youngest age group (15-24), the vast majority (82%) of those who reported wanting more children did not change their preference; only 14% changed their preference and decided to limit their childbearing. Three-quarter of women aged 15-24 who wanted to stop having children changed their mind and reported wanting more children; about one 1 in 5 (21%) did not change their preference and reported wanting to limit their childbearing.

Among women aged 25-34, about two-thirds (63%) of those who want more children did not change their preference while about a third (30%) want to limit their childbearing after reporting that they want more children. On the other hand, more than a quarter (29%) of women aged 25-34 who wanted no more children changed their preference and reported wanting more children; about two-thirds (64%) did not change their preference of limiting their childbearing.

Among the oldest cohort of women (35-49), a quarter of them did not change their preference of wanting more children; 72% decided to limit their childbearing after reporting that they want more children. Very few women aged 35-49 (8%) who wanted to limit their childbearing changed their preference and reported wanting to continue having children; the vast majority (91%) of those who want no more children did not change their preference.

Table 2: Transition probabilities of fertility preferences of married women aged 15-49

Fertility preferences	All women		
	Want more children	Want no more	Uncertain

Want more children	0.719	0.237	0.044
Want no more	0.425	0.527	0.049
Uncertain	0.440	0.420	0.140
15-24			
	Want more children	Want no more	Uncertain
Want more children	0.825	0.143	0.033
Want no more	0.750	0.217	0.033
Uncertain	0.588	0.235	0.177
25-34			
	Want more children	Want no more	Uncertain
Want more children	0.635	0.303	0.062
Want no more	0.287	0.641	0.072
Uncertain	0.355	0.516	0.129
35-49			
	Want more children	Want no more	Uncertain
Want more children	0.250	0.722	0.028
Want no more	0.077	0.908	0.015
Uncertain	0.500	0.500	0.000

Effect of fertility preferences on contraceptive use over time

Table 3 presents the results from the random-intercept logistic regression analysis for all women and for each age group. It shows that it is only among women aged 25-34 that fertility preference is significantly associated with contraceptive use over time, with those wanting to limit their childbearing being 36% more likely to be users than those who want more children.

In the general model, women from ethnic groups such as Luhya, Luo and Kamba are less likely to use contraception than their Kikuyu counterparts. The same association is observed among women aged 15-24 and those aged 25-34.

Education is significantly associated with contraceptive use over time, with those with at least primary level of education being more likely to be users than their counterparts who have never attended school. This result is valid in the general model and across the 15-24 and 25-34 age groups.

Surprisingly, the effect of parity is counterintuitive as the higher the parity the lower are the chances of using contraception among women over time. This is true in all models.

Women who have ever used contraception are more likely to use it over time. This result is not significant among the women aged 35-49.

Table 3. Random-intercept logistic regression odd ratios on contraceptive use over time, full sample and by age group

VARIABLES	Odd ratios (SE)			
	15-24	25-34	35-49	All women 15-49
Fertility preferences (Want more)				
Want no more	0.96 (0.13)	1.35** (0.18)	1.23 (0.53)	1.11 (0.10)
Undecided	1.58 (0.48)	1.09 (0.36)	0.88 (0.80)	1.22 (0.26)
Age group (ref. 15-24)				
25-34				1.20 (0.23)
35-49				0.97 (0.16)
Ethnic group (ref. Kikuyu)				
Luhya	0.52*** (0.08)	0.44*** (0.09)	0.91 (0.41)	0.51*** (0.06)
Luo	0.46*** (0.07)	0.48*** (0.10)	0.28** (0.16)	0.45*** (0.05)

Kamba	0.82 (0.12)	0.55*** (0.10)	0.81 (0.42)	0.72*** (0.08)
Other	0.38*** (0.06)	0.60** (0.12)	0.81 (0.44)	0.48*** (0.06)
Education (ref. Never attended school)				
Primary	1.82** (0.54)	2.21*** (0.66)	0.63 (0.33)	1.50** (0.27)
Secondary & +	2.18** (0.68)	2.25** (0.72)	1.37 (0.82)	1.76*** (0.34)
Parity	0.86** (0.05)	0.83*** (0.04)	0.87* (0.06)	0.88*** (0.03)
Slum residence (ref. Korogocho)				
Viwandani	1.09 (0.12)	1.36** (0.20)	0.85 (0.30)	1.19** (0.10)
N	1869	1374	244	3487
Wald Chi-square	244.43***	89.93***	15.52	323.30***
Log Likelihood	-1503.95	-1171.69	-204.96	-2931.03
Rho	0.091	0.232	0.247	0.162
Sigma_u	0.574	0.998	1.038	0.798

z-statistics in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

4. Conclusion

These preliminary analyses show that there is substantial regularity and stability in reported fertility preferences over time among urban poor women living in slum settlements. Overall, the majority of women keep their preferences. We however noted that younger women aged 15-24 are likely to change their preferences over time, passing from wanting no more to wanting additional children. On the other hand, older women aged 35-49 are likely to change their preferences from desiring more children to limiting their childbearing. We also show that among women aged 25-34, the desire to limit childbearing is strongly associated with contraceptive use over time. Further analyses will help better understand the relationship between fertility preferences and type of contraceptive use over time.

5. References

1. Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], ORC Marco. *Kenya Demographic and Health Survey 2003*. Calverton, Maryland: CBS, MOH, and ORC Marco; 2004.
2. Kenya National Bureau of Statistics (KNBS), ICF Macro. *Kenya Demographic and Health Survey 2008-09*. Calverton, Maryland: KNBS and ICF Macro; 2010.
3. *Population and Health Dynamics in Nairobi's Informal Settlements: Report of the Nairobi Cross-sectional Slums Survey (NCSS) 2000*. Nairobi: African Population and Health Research Center; 2002.
4. Taffa N, Chepnego G, Amuyunzu-Nyamongo M. Child morbidity and healthcare utilization in the slums of Nairobi, Kenya. *Child morbidity and healthcare utilization in the slums of Nairobi, Kenya*. Oct 2005;51(5):279-284.
5. Taffa N, Chepnego G. Determinants of health care seeking for childhood illnesses in Nairobi slums. *Determinants of health care seeking for childhood illnesses in Nairobi slums*. Mar 2005;10(3):240-245.
6. Fotso JC, Ezeh A, Madise N, Ziraba A, Ogollah R. What does access to maternal care mean among the urban poor? Factors associated with use of

- appropriate maternal health services in the slum settlements of Nairobi, Kenya. *What does access to maternal care mean among the urban poor? Factors associated with use of appropriate maternal health services in the slum settlements of Nairobi, Kenya*. Jan 2009;13(1):130-137.
7. Ziraba AK, Mills S, Madise N, Saliku T, Fotso JC. The state of emergency obstetric care services in Nairobi informal settlements and environs: results from a maternity health facility survey. *The state of emergency obstetric care services in Nairobi informal settlements and environs: results from a maternity health facility survey*. 2009;9:46.
 8. Fotso JC, Ezeh A, Oronje R. Provision and use of maternal health services among urban poor women in Kenya: what do we know and what can we do? *Provision and use of maternal health services among urban poor women in Kenya: what do we know and what can we do?* May 2008;85(3):428-442.
 9. Essendi H, Fotso, J-C. Barriers to the utilization of formal emergency obstetric care services: Accounts of slum dwellers in Nairobi Kenya. *Barriers to the utilization of formal emergency obstetric care services: Accounts of slum dwellers in Nairobi Kenya*. Forthcoming.
 10. Kyobutungi C, Ziraba AK, Ezeh A, Ye Y. The burden of disease profile of residents of Nairobi's slums: Results from a Demographic Surveillance System. *The burden of disease profile of residents of Nairobi's slums: Results from a Demographic Surveillance System*. 2008;6:1.
 11. Ziraba AK, Kyobutungi C, Zulu EM. Fatal injuries in the slums of Nairobi and their risk factors. *Fatal injuries in the slums of Nairobi and their risk factors*. Forthcoming.
 12. Ziraba AK, Madise N, Mills S, Kyobutungi C, Ezeh A. Maternal mortality in the informal settlements of Nairobi city: what do we know? *Maternal mortality in the informal settlements of Nairobi city: what do we know?* 2009;6:6.
 13. Kabiru CW, Beguy D, Undie C-C, Zulu EM, Ezeh AC. Transition into first sex among adolescents in slum and non-slum communities in Nairobi, Kenya. *Journal of Youth Studies*. 2010;13(4):453-471.
 14. Zulu EM, Doodoo FN-A, Ezeh AC. Sexual risk-taking in the slums of Nairobi, Kenya, 1993-98. *Popul Stud* 2002;56(3):311-323.
 15. Beguy D, Kabiru CW, Nderu EN, Ngware MW. Inconsistencies in self-reporting of sexual activity among young people in Nairobi, Kenya. *Inconsistencies in self-reporting of sexual activity among young people in Nairobi, Kenya*. Dec 2009;45(6):595-601.
 16. Fotso JC. Urban-rural differentials in child malnutrition: trends and socioeconomic correlates in sub-Saharan Africa. *Urban-rural differentials in child malnutrition: trends and socioeconomic correlates in sub-Saharan Africa*. Mar 2007;13(1):205-223.
 17. Ndugwa R, Cleland J, Madise N, Fotso J-C, Zulu E. Menstrual Pattern, Sexual Behaviors, and Contraceptive Use among Postpartum Women in Nairobi Urban Slums. *Menstrual Pattern, Sexual Behaviors, and Contraceptive Use among Postpartum Women in Nairobi Urban Slums*. 2010:1-15.