Role of fertility size preferences in explaining stalling fertility transition in Kenya

By

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Abstract

Rapid fertility decline experienced in Kenya in the late 1980s stalled in the late 1990s. This study examined factors influencing women's propensity to transition from third to fourth births in Kenya. This was meant to assess the preparedness of the county to achieve a TFR of 2.6 births by 2030. Data was obtained from the Kenya Demographic and Health Surveys of 2003 and 2008/9. Logistic regression model was utilized data analysis. The results showed that education level, region of residence, religion, ever use of contraception, wealth quintile, age at the start of the interval and desire for an additional child were significant determinants of these birth transitions. The main policy implication is the need to improve family planning services access across the country and increase the proportion of women with at least secondary level of education.

Introduction and background to the study

Prior to the 1970s fertility in Kenya had been rising steadily. But, since, the mid-1980s, Kenya has experienced perhaps one of the most remarkable fertility transitions in human history that violated all earlier expert predictions (Blacker, 2002; Population council, 1998; Brass and Jolly, 1993; Robinson, 1992). Total fertility rate (TFR) declined from 8.1 children per woman in 1977/78 to 6.7 in 1989 and 5.4 in 1993. The total fertility rate (TFR) further declined to 4.7 children per woman in 1998. Kenya Demographic and Health Survey (KDHS) 2003 results further showed that infant and child mortality indicators had continued to worsen in the 1990s, fertility preferences had stalled and contraceptive use had also stagnated (CBS et al., 2004). According to KDHS 2008/9, TFR declined to 4.6.

A number of studies have examined factors responsible for rapid fertility declines which started in the late 1970s and 1980s. Three perspectives have emerged as dominant explanations for the observed fertility declines experienced in Kenya. These were changes in proximate determinants of fertility and specifically increases in contraceptive prevalence in Kenya (Ekisa &Hinde, 2005; Cross et al.,1991; Njogu, 1991; Brass and Jolly, 1993; Blacker, 2002; Ezeh and Dodo, 2001; Sibanda, 1999; Population council, 1998; Njogu, 1991), changes in attitudes regarding large family sizes due to high costs associated with raising up many children (Robinson, 1992) and changes in cultural fertility models supporting high fertility due to the pressures of modernization (Watkins, 2000).

A study by Westoff & Cross (2006) attributed the reversal of fertility decline in Kenya to a stall in contraceptive prevalence and also to an increase in the number of women desiring more children. The desire for more children was seen as a response to increased child mortality arising from the HIV/AIDS pandemic experienced at the time. This finding was corroborated in a study by Monica & Agwanda (2010) who found that HIV/AIDS could have been responsible for the increased desire for more children as women sought to replace children who had died. These findings have necesssisted more

research to explain why fertility varies and /or remains constant over time. This study examined dynamics of fertility transition in Kenya in 2003 and 2008/9 using the birth interval perspective. Parity specific approach to studying fertility is useful for analysing the family-building process. This is because when people think in terms of having children, they think in terms of whether or not and when to have a first or a subsequent birth. This approach indicate changes in fertility due changes in timing of reproduction, spacing of births or in the changing reproductive patterns at low or high parities. Studies that have examined the dynamics of the Kenyan fertility transition using the birth-interval approach are also rare. This study sought to answer the following questions:

i)   What role has socio-economic, cultural and demographic factors played in influencing transition from third births to fourth births?

ii) Has child mortality played any role in these transitions?

Theoretical perspectives of fertility transition and Literature review

Researchers have over time made various attempts to provide theoretical explanations for observed patterns and growth in human populations. The first classical attempt to explain how human populations grow and change over time was made by Notestein in 1945. He noted that pre-industrial societies were characterised by high fertility and high mortality. The balance between these two dynamics of population change somehow ensured that the society survived. Accordingly, he noted that as a society develops; then industrialisation and urbanisation set in motion a process of social advancement that culminate in socio-economic progress. The social advances in the society open opportunities for more education, employment for both men and women, career advancement and access to better health care. He was of the view that the benefits of modern life style coupled with increasing costs of raising quality children force families to have fewer children in order to maintain a certain social status. The economy also affords women lower costs for birth control and thus women are able to achieve their desired family sizes. The economic benefits of children decline and this leads to lower fertility.

Other researchers have strongly argued that fertility decline is strongly influenced by diffusion and social interaction processes (Mason, 1997, Bongaarts & Watkins, 1996 Montgomery & Caterlin, 1996, Cleland & Wilson, 1987). These scholars are of the view

that decline in fertility can be facilitated by spread of information, ideas and behaviours. They also argue that social networks on the other hand, can change attitudes and behaviour of an individual with respect to reproduction. They conclude that these two processes can encourage women to adopt birth control measures and this can result to a rapid decline in fertility even in the absence of socio-economic development. This is because the demand for birth control will be met and its associated costs will also be affordable. This has been experienced in many developing countries which have witnessed rapid declines in fertility even in the absence of high levels of socio-economic development. As Bongaarts (2002) noted… "Diffusion/social interactions are important in the early phases of transition. Once this process has largely run, its course, fertility late in the transition becomes more closely tied to the level of socio-economic development."

Researchers have also attempted to offer possible explanations as to why fertility stalls occur. One possible explanation has been the fact that countries that have experienced stalls in their fertility transitions have more often that not also experienced a stall in the contraceptive prevalence (Askew, 2009; Bongaarts, 2006). It has also been argued that there is no established pattern in the trend of socio-economic determinants during fertility stalls. For instance, it has been noted that for some countries such as Kenya and Ghana fertility stalled with little changes in socio-economic development indicators while other countries experienced stalling fertility as socio-economic development continues at a fairly rapid pace (Bongaarts, 2006).

Empirical literature on causes of stalling fertility transitions

According to the classical demographic transition theory once fertility decline is underway, it continues until replacement level fertility is attained. This pattern has been interrupted in a number of developing countries; where fertility seemed to stall at levels above replacement in the late 1990s and early 2000s. Researchers have attempted to offer possible explanations why fertility may stall above replacement level. However, it's not yet very clear why fertility varies and/or remains constant over the course of time.

Stalling fertility declines have been attributed to slowing of socio-economic development, infant and child mortality, short birth intervals, declines in contraceptive use, HIV/AIDS (Shapiro& Gebresellassie, 2008; Garenne, 2007; Westoff et al., 2006; Bongaarts, 2005. Using DHS data from 24 countries with multiple surveys, Shapiro& Gebresellassie (2008) examined the current status of fertility transition in Sub-Saharan Africa and the extent to which fertility had stalled. They found that fertility transition had started in almost all the countries studied and that in nearly two-thirds of these countries there was evidence of fertility decline. They attributed stalling fertility in some of the countries to faltering in the pace of socio-economic development as reflected in the lagged infant and child mortality rates and lagged growth in GDP per capita. However, it was also interesting to note that in some of the countries slower declines in fertility were associated with higher growth in GDP per capita which was contrary to expectations. According to the findings, modern contraceptive use or ideal were not significantly related to any changes in fertility. Fertility transition was also found to be more pronounced in urban areas compared to rural areas. Moreover, the findings identified education, infant and child mortality, modern contraceptive use, the percentage of women in union and place of residence as being significantly related to fertility levels. A study by Garenne (2007) attributed stalling fertility transitions at national level to changes in age at birth, contraceptive use and socio-economic conditions. In a related study by Ojakaa (2007) he observed that the patterns and determinants of fertility transition in Kenya could be explained by increase in age at first marriage and use of contraception. This scenario was observed in the areas and regions perceived as modernized particularly in urban areas and rural areas of Central Kenya. The study also found that child survival was significantly related to the risk of a woman having another child and that motivation for fertility control was noted to be significant while access to family planning was not. Furthermore, the findings revealed a reversal in the trend of fertility decline in Kenya in the five year period before the Kenya Demographic and Health Survey (KDHS) of 2003. This was attributed to a rapid increase in infant and child mortality in the 1990s, education and exposure to mass media messages. He noted that in the timing of transition from second to third births in Kenya; regional differentials existed and these could be attributable to varying levels of socio-economic development and conservative cultural

practices with respect to reproduction. The study found that rural women were more likely to experience second births compared to their rural counterparts and that transition from first to second and from second to third births increased with an increase in age at first birth.

Westoff et al., (2006) in a study of stalled fertility transition in Kenya observed that fertility stalled through out the country. They noted that the stall was more pronounced among women with no education and those women with at least secondary education level experienced a modest decline in fertility. The stall in contraceptive prevalence occurred among women in the young age cohorts and those with little education but contraceptive use was noted to have increased for women who had been sexually active in the four weeks prior to the survey. This pattern was also observed in other countries in Southern and Eastern Africa and was possibly attributed to the high incidence of HIV/AIDS prevailing in those countries. The stall in contraceptive prevalence could perhaps also be attributed to the observed decline in the proportion of women who want no more children in urban and rural areas, in all provinces, and ethnic groups and among women with less than secondary education. This was a marked departure from the steady increase in the proportion of women wanting no more children since 1997. The findings imply that, HIV/AIDS may have played a role in this reversal of reproductive preferences in Kenya through increase in child mortality. This implies that women whose children had died were more likely to go on and replace them so as to act as insurance to the high incidences of child deaths.

Bongaarts (2005) studied the causes of stalling fertility transitions in developing countries. He noted that, although these declines in fertility were expected to continue until replacement level fertility was reached but evidence in the late 1990s showed that fertility had stalled in mid-transition in five countries including ; Bangladesh, Dominican Republic, Ghana, Kenya and Turkey. He observed that, the level of stalling varied from 4.7 births per woman in Kenya to 2.5 births per woman in Turkey. The findings attributed stalling fertility to a plateauing in contraceptive prevalence and demand for contraception
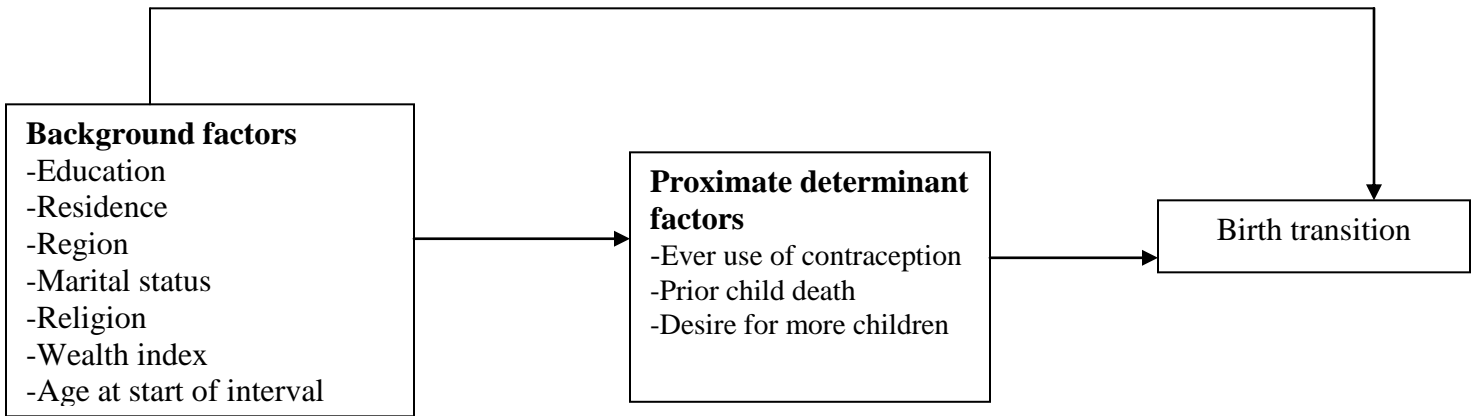
and also a stall in the number of children desired by women. The findings didn't establish any particular pattern in the socio-economic determinants of fertility during period of fertility stall. For instance in Kenya and Ghana, fertility was found to have stalled while development indicators had not experienced any change. But in other countries such as Turkey, Peru, Columbia socio-economic development was noted to have continued and in over 85 percent of the countries fertility was lower than the expected level f development. He concluded that stalling fertility was therefore attributed to the levels of socio-economic development in Kenya and Ghana

In summary, it's clear from the literature reviewed that the causes of fertility transitions remain inconsistent and controversial. For instance, the role of socio-economic factors in explaining fertility transition remains inconclusive. Fertility has been observed to decline even in countries with low levels of socio-economic development such as Bangladesh and stalled in countries with poorer indicators of socio-economic development such Kenya and Ghana. In other countries, no relationship was established between increase in contraceptive use and fertility decline. Moreover, other countries have experienced a stall in fertility with no significant changes in unmet need and unwanted fertility. This study contributes knowledge on fertility stall in Kenya by identifying factors influencing transition from third to fourth births in Kenya between 2003 and 2008/9. These transitions were selected because they may be indicative of change in family size preferences in Kenya.

Knowledge gained in study will also be useful for policy makers, programme managers and researchers. It will also help policy makers come up with appropriate programs to enhance socio-economic development in the country. Information will also enable government plan to manage population growth and also match population growth with development goals e.g. FP, maternal and child health programmes.

Figure 1: Conceptual framework to explain fertility transition in Kenya

Background factors
-Education
-Residence
-Region
-Marital status
-Religion
-Wealth index
-Age at start of interval

Proximate determinant factors
-Ever use of contraception
-Prior child death
-Desire for more children

Birth transition

Source: Bongaart's (1978)

The study seeks to explore mechanisms through which background and proximate factors may influence transition from from third to fourth birth (see Conceptual framework, Figure 1). There could be two pathways through which background and proximate factors affect transition from from third to fourth birth. One mechanism seeks to establish whether background factors affect transition from from third to fourth birth independent of proximate factors. The background factors considered in this study are: education level, place of residence, region of residence, marital status, religion, wealth index and age at the start of the interval. The background factors included are a proxy measure for the socio-economic conditions. The assumption is that socio-economic development is considered as a major cause of fertility decline over time. This is because the high costs and benefits associated with children motivate parents to have fewer children and declines in mortality raises survival chances of children and that means that parents need fewer children to achieve their desired fertility. This scenario creates demand for family planning as parents seek to maintain their desired fertility. Consequently as a society advances in socio-economic development the social costs of birth control are also reduced.

The second pathway examines whether background factors act through proximate factors to influence transition from third to fourth births. The proximate factors included in this

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study are ever use of contraception and a prior child death. This stems from the assumption that a woman's background characteristics such education level, residence and wealth quintile determines her socio-economic status and hence level of exposure to knowledge and access of health services. This means that more educated women and those living in urban areas are more likely to access and use modern methods of contraception and this is likely to influence whether or not they transition from second to third birth and from third to fourth birth.

Thus we hypothesise that more educated women, those living in urban areas, those from Central province, currently married women and those women from wealthier households are less likely to transition from third to fourth births. We also hypothesise that women who have ever used a modern method of contraception, those who have never experienced a prior child and those who desire another child were less likely to transition from third to fourth births.

Data and Methods

Sources of Data

The data for this study are from the Kenya Demographic and Health Surveys, 2003 and 2008/9. These were nationally representative surveys of 8195 and 8444 women aged 15-49. They were designed to provide data to monitor population and health situation in Kenya. They collected information on fertility, marriage, sexual activity, awareness and use of family planning methods, fertility preferences, and breastfeeding. Additional information was also collected on malaria and use of mosquito nets, domestic violence and HIV testing of adults.

The implementation of the survey was successfully undertaken (CBS et al., 2003 & KNBS et al., 2010). A total of 9936 households were selected in the sample for KDHS 2008/9 and 9057 households were successfully interviewed yielding a response rate of 98 percent. A total of 8767 women were found to be eligible for interview and 8444 were interviewed giving a response rate of 96 percent. Of the eligible 8889 households in KDHS 2003, 8561 were successfully interviewed, yielding a response rate of 96 percent. In the interviewed households, 8717 eligible women aged 15-49 were identified and 8195 were successively interviewed, yielding a response rate of 94 percent. We examined the transition from third to fourth birth among women who had a third birth. From the KDHS 2003 a total of 689 women had experienced a second birth and 531women transitioned to a third birth while 421 experienced a fourth birth. During the KDHS 2008/9 a total of 789 women had a second birth and 593 women transitioned to a third birth while 477 transitioned to a fourth birth.

A complete birth history covering all live births of each woman interviewed was obtained. For such births the survival status was ascertained and also the age at death for those infants /children who had died. Thus, it was possible to determine the spacing between any two live births and also the intervals at which the infant/child deaths occurred. In addition, for each respondent her background and demographic

characteristics were obtained. Information on sexual behaviour and family planning practice that is expected to affect directly a woman's reproductive performance was also collected.

Variables and Their measurement

Dependent variable for the study

The dependent variable in this study is whether or not a woman made the transition from third to fourth birth for the five year period before Kenya Demographic and Health Surveys of 2003 and 2008/9.

Key independent variables of the study

Socio-Economic and Cultural Factors
Education level

Educational level is highly correlated with fertility. It is associated with higher future incomes and demand for quality children. Education increases the chances of participating in labour force (or employment) for women. Better educated women may reduce their completed fertility because of competing demands of their time by either limiting the number of births (children) or by having longer birth intervals. This study classified levels of education into three categories namely; no education, primary education and secondary and above level of education. The use of educational level only refers to the number of years of formal schooling and doesn't include education obtained in adult education programmes.

Place of residence

This is the area where the respondent was living at the time of the survey classified as either urban or rural. The urban-rural dictum is used to denote the differential effects of the place of residence. Urban area is be used as the reference category.

Region of residence

Kenya has eight administrative provinces including Nairobi, which is the capital city. Seven dummy variables representing each of these regions are created and Western province is chosen as the reference category.

Marital status

This variable is included to capture the differential exposure status to intercourse (differences in coital frequency). This group includes those who reported to be formerly married as well as those who reported that they were cohabiting. This variable is classified into: never married, currently married, never and formerly married.

Religion

This refers to one's religious affiliation. In this study the variable is recoded into: Catholics, Protestants/other Christians, Muslims and other religions. This variable was included to capture some of socio-cultural issues related childbearing.

Demographic Factors

The only demographic factor included in this study is the age of the woman at the start of interval.

Age at birth of child

The age of the woman at the birth of the child opening the interval is a proxy for fecundity related differences in child bearing since the onset of secondary sterility rises with age. This is a continuous variable and is measured in completed years.

Proximate factors

Ever use of contraception

This is a deliberate attempt by a woman to avoid conception by use of natural or modern methods. This is categorized into: never used, used traditional and used modern methods.

Survival status of the preceding child (Prior child death)

It is coded as equal to 1 if a woman ever experienced a death of any prior child and equal to 0 if it didn't occur.

Desire for more children

This variable is included to capture future fertility intentions. It codes as: those who wanted no more children, women who wanted a child within two years and those who wanted a child after two years.

Methods of data analysis

The study utilized descriptive statistics and logistic regression model as the main methods of data analysis. Descriptive statistics were used at level one to describe the distribution of births in the five year periods before the Kenya Demographic and Health Surveys of 2003 and 2008/9. They were also used to describe the distribution of births by various key background characteristics and also to estimate parity progressions for the five year periods before the two surveys.

Logistic regression was used in this study to identify the socio-economic, cultural, demographic, child mortality and proximate factors associated with transition from third to fourths birth in Kenya between 2003 and 2008/9. This regression model was appropriate because the dependent variable was dichotomous or binary. In this study, the dependent variable was whether or not a woman made the transition from third to fourth birth in Kenya for the period between 2003 and 2008/9. The impact of predictor variables is usually explained in terms of odds ratios. Logistic regression applies maximum likelihood estimation method to estimate parameters. One multivariate logistic regression model was fitted for all the variables to identify factors influencing transition from third to fourth birth for the five-year period before KDHS 2003 and 2008/9. All analyses were done using STATA 11. These transitions are critical because they may be indicative of changing family size preferences. This is important if the goal of reducing fertility from the current average of 4.6 children per women to 2.6 births per woman is to be realized by the government by 2030.

Descriptive results

The distribution of births in the five year period periods prior to the surveys for the Kenya Demographic and Health Surveys (KDHS) 2003 and 2008/9 are shown table 1. The results show that the distribution of births by various parities for the two time periods doesn't indicate significant differences. The results show that there was a decline in the proportion of first births by 3 percentage points between 2003 and 2008/9. A slight increase in the proportion of births of parities 2 and 3 was observed for women in 2008/9 but a similar proportion was noted for births of order 4 for both time periods. The results also show that the, mean birth order for the two time periods is more or less the same.

Table 1: Distribution of births in the five year periods before the surveys for KDHS 2008/9

Period	Birth order					
	1	2	3	4	5+	N
1999-2003	24.8	19.63	16.05	11.59	28.65	**6102**
2003-2008/9	22.38	21.37	16.65	12.04	27.57	**5852**
Mean birth order for 1999-2003	**3.5**					
Mean birth order for 2008/9	**3.4**					

The distribution of births by key background characteristics is shown in table 2. The results show that there was an increase in the proportion of births of parities 2-4 between 2003 and 2008/9 for women with no education. The proportion of births of orders 3-5 are slightly higher for women with primary level of education in 2008/9 than in 2003 while the proportion of births of order 2 are higher for women with secondary and above level of education in 2008/9. There was a marked increase in the proportion of births of order 2 (from 23 % to 31 %) to women living in urban areas between 2003 and 2008/9. There

was also a decline in the proportion of births of orders 4 and 5 and above by 5 % and 6 % respectively between the two time periods. The results don't indicate significant changes in the proportions of births of various orders occurring to women living in rural areas between the two time periods.

There was a slight increase in the proportions of births of orders 1, 4 and 5 and above between 2003 and 2008/9 for women living in Western province. In Nairobi province, the proportion of births of order 2 increased by 7 percentage points between the two time periods and by 5 % and 3 % respectively for birth orders 4 and 5 and above in the same period. Central province registered a decline of between 4% and 5% percent respectively in the proportions of births of orders 1 and 2 but a marginal increase was observed for births of order 4. Interesting patterns were observed for Coast province. A decline of 2 percentage points was noted for births of order 4 but the proportion of births of all other orders remained the same for women in this province. For Eastern province, a decline of 4 percentage points was observed for births of order 1 between 2003 and 2008/9 and a marginal increase in births of order 3 (from 17% to 20%) between the two time periods. Nyanza province registered an increase in the proportion of births of orders 1-4 and a reduction of 7 percentage points for births of orders 5 and above. The results show that Rift Valley province registered a marginal increase in the proportion of births of orders 2-4 and a decline of 4 % for births of order 1 for the same time period. North Eastern province registered a substantial increase in the proportion of births of orders 2 and 3 (from 6 % to 5 % respectively) for the same time period. But, the province also recorded drastic declines in the proportion of births of orders 5 and above; from 51 % to 38% in 2008/9.

The results show that the proportion of births of orders 2 to 5 and above increased for women aged 15-19 years while for women aged 20-34 years the proportion of births of order 2 increased by 3 % but declined marginally for other birth orders between 2003 and 2008/9. For women aged 35 and above years, the proportion of births of order 5 declined by 5 percentage points but increased by 2 % for births of orders 2-3 for the same time period. The proportion of births occurring to currently married women increased by one percentage point for births of orders 2-3 and declined by the same margin for births of

orders 1 and 5 and above. The proportion of births occurring to formerly married women increased by 5% for births of orders 2 but the proportion remained the same for births of orders 4 and 5 and above. A 7% decline in the proportion of births of order 1 was observed for never married women and a corresponding increase in the proportion of births of order 2 for the same time period.

For religious affiliation, the proportion of births observed for women professing Catholic faith declined by 2 % for births of order 1 and increased by a similar margin for births of order 2 between 2003 and 2008/9. A decline of 2 percentage points was observed for births of order 5 and above for women professing Protestant faith and an increase of one percentage point was noted for births of orders 2-4 for the same group of women for the same time period. Births attributable to women professing Muslim faith increased by 3% and 1% respectively for births of orders 2 and 3 but declined by the same margin for births of orders 5 and above and 4 for the same period. For women professing other religions, the proportion of births increased by 5% and 4% for births of orders 2 and 5 and above respectively but declined by 8% for births of order 1 between 2003 and 2008/9.

Table 2: Distribution of births by key background characteristics for KDHS 2003 and KDHS 2008/9

Variable	Birth order					
	1	2	3	4	5+	N
Education level						
No education KDHS 2008/9	12.77	16.67	15.14	12.53	42.89	763
KDHS 2003	14.44	12.03	13.40	10.45	49.68	938
Primary education KDHS 2008/9	20.14	20.10	17.26	12.68	29.82	3,713
KDHS 2003	23.45	20.46	16.08	11.91	28.10	3,901
Secondary plus KDHS 2008/9	33.77	27.39	15.85	10.02	12.96	1,375
KDHS 2003	33.13	22.17	17.93	11.43	14.75	1,263
Residence						
Urban KDHS 2008/9	34.97	30.71	15.32	8.66	10.34	1,074
KDHS 2003	34.22	22.89	16.09	11.06	15.75	1,143
Rural KDHS 2008/9	19.55	19.26	16.95	12.80	31.44	4,777
KDHS 2003	21.74	18.88	16.04	11.711	31.63	4,959
Region of residence						
Western KDHS 2008/9	19.40	20.04	16.05	11.50	33.01	703
KDHS 2003	21.11	20.09	15.91	11.12	31.76	776
Nairobi KDHS 2008/9	40.02	29.27	14.54	8.68	7.49	334
KDHS 2003	39.29	22.09	16.00	12.37	10.25	398
Central KDHS 2008/9	27.40	26.63	17.65	11.69	16.63	466
KDHS 2003	30.88	22.46	17.75	10.94	17.97	652
Coast KDHS 2008/9	23.56	19.92	16.12	13.50	26.90	495
KDHS 2003	24.34	20.19	16.32	12.47	26.68	510
Eastern KDHS 2008/9	19.28	20.85	19.85	12.20	27.83	890
KDHS 2003	22.64	19.53	17.21	12.68	27.95	946
Nyanza KDHS 2008/9	24.43	19.67	15.49	12.73	27.68	1,144
KDHS 2003	21.28	18.39	13.91	10.95	35.46	1000
Rift Valley KDHS 2008/9	19.45	21.14	16.20	11.96	31.26	1,641
KDHS 2003	22.74	19.30	16.29	11.33	30.35	1,639
North Eastern KDHS 2008/9	14.05	17.61	17.41	12.80	38.13	178
KDHS 2003	13.10	10.87	13.47	11.89	50.67	181
Age cohort						
15-24 years KDHS 2008/9	51.95	29.45	12.48	4.43	1.70	1,943

KDHS 2003	55.29	30.15	11.56	2.52	0.48	2,077
25-34 years						
KDHS 2008/9	10.29	22.17	22.37	17.87	27.31	2,845
KDHS 2003	10.95	19.37	23.17	18.95	27.56	2, 861
35+ years						
KDHS 2008/9	0.69	4.43	8.97	10.35	75.56	1,063
KDHS 2003	0.66	1.50	6.57	9.67	81.60	1,163
Marital status						
Currently married						
KDHS 2008/9	18.52	21.43	17.67	12.98	29.41	4,933
KDHS 2003	20.11	20.33	16.95	12.22	30.40	5,230
Formerly married						
KDHS 2008/9	20.71	21.79	15.83	11.51	30.16	497
KDHS 2003	26.11	16.99	15.16	11.76	29.98	504
Never married						
KDHS 2008/9	69.55	20.13	5.68	1.65	2.99	421
KDHS 2003	77.66	13.37	4.55	2.33	2.09	368
Religion						
Catholic						
KDHS 2008/9	23.16	23.42	16.48	12.20	24.74	1,170
KDHS 2003	25.41	20.81	16.49	11.23	26.06	1.431
Protestant						
KDHS 2008/9	22.98	20.96	16.59	12.05	27.42	3,126
KDHS 2003	24.27	19.88	15.74	11.42	28.70	3,925
Muslim						
KDHS 2008/9	19.88	19.38	17.53	11.76	31.45	516
KDHS 2003	19.83	15.81	16.76	13.49	34.11	554
Other						
KDHS 2008/9	14.21	22.16	16.57	11.64	35.42	239
KDHS 2003	22.43	16.87	17.15	12.21	31.34	192

Source: Primary analysis of KDHS, 2003 & KDHS, 2008/9

Parity Progressions for Kenya, 2003 – 2008/9

Table 3 shows parity progressions for Kenya between 2003 and 2008/9. The results show that the patterns of parity progressions didn't change significantly between the two time periods. The proportion of women experiencing a first birth increased by 4% between 2003 and 2008/9. The results indicate that the proportions of women experiencing births of parities 2-5 increased by one percentage point between the same time period. Furthermore, the proportion of women experiencing a tenth birth increased by 17% from 40% to 57% between 2003 and 2008/9.

Table 3: Parity progression in the five year periods before the surveys; KDHS, 2003 and 2008/9

	Parity									
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	10
Parity progression for KDHS 2003	0.706	0.706	0.691	0.714	0.712	0.674	0.679	0.607	0.589	0.403
Parity progression for KDHS 2008/9	0.749	0.724	0.679	0.700	0.701	0.628	0.625	0.605	0.580	0.569

Multivariate results

Factors influencing transition from third to fourth birth, KDHS 2008/9

The results showing factors influencing transition from third to fourth birth for all factors are presented in table 4. The results show that women with primary and secondary and above level of education are associated with lower odds of transition to a fourth birth compared to women with no education. Wealth index is a significant predictor of the odds of transition to a fourth birth. Women from richer households were 0.5 times less likely to experience a fourth birth whereas those from the richest households were 0.3 times less likely to experience a fourth birth compared to women from the poorest households. Age at the start of the interval was also significantly related to the risk of transition to a fourth birth. A one year increase in age at the start of the interval is associated with a lower transition to a fourth birth. Moreover, the odds of transition to a fourth birth were lower for women who had ever used a modern method of contraception compared to a woman who had never used any method of contraception. The odds of transition to a fourth birth were 0.3 and 0.5 times respectively for women who desired another child within two years and after two years compared to women who desired no more children. The odds of transition to a fourth birth was higher for women living in

rural areas compared to those resident in urban areas and was also higher for currently married women compared to never married women. However, these results weren't statistically significant.

Factors influencing transition from third to fourth birth, KDHS 2003

The results showing factors influencing transition from third to fourth birth for all factors are presented in table presented in table 5. Women resident in Central province were 0.4 times less likely to experience a fourth birth compared to those living in Western province. Generally, except for women in Nairobi province, the odds of transition to a fourth birth were lower for women in other provinces. These results were however not statistically significant. Women from poorer, middles and richer households were 0.4 times less likely to experience a fourth birth while those from richest households were 0.3 times less likely to transition to a fourth birth compared to women from the poorest households. Age at the start of the interval was significantly associated transition to a fourth birth. A one year increase in age at the start of the interval was associated with a 0.9 times lower odds of transition to a fourth birth. Women who had ever used a modern method of contraception were associated with reduced odds of transition to a fourth birth compared to women who had never used any method. Those women who desired another child within two years were 0.4 times less likely to transition a third birth compared to women who never desired another child at all. The results also indicate that the odds of transition to a fourth birth was higher for women with primary and secondary and above level of education, for women living in rural areas, those currently married, women professing Muslim and other faith and those who experienced a prior child death. However, these results weren't statistically significant.

Discussion of results

This paper tested a number of hypotheses regarding factors influencing transition from third to fourth births for Kenya between 1999-2003 and 2003-2008/9. First, we hypothesised that more educated women, those living in urban areas, those from Central province, currently married women and those women from wealthier households are less

likely to transition from third to fourth births. We also hypothesised that women who have ever used a modern method of contraception and those who have never experienced a prior child are less likely to transition from third to fourth births. For each of the two time periods i.e. 2003 and 2008/9; one model was fitted to include both background and proximate factors.

The results for the five year period before KDHS 2008/9 show that the odds of transition from third to a fourth birth for model were strongly associated with education level, wealth index and age at the start of the interval. The odds of transition to a fourth birth were lower for women with secondary and above level of education compared to women with no education. But, the odds of transition to a fourth birth were significantly lower for women from middle, richer and richest households compared to women from poorest households. It was also observed to be lower with an increase in age at the start of the interval.

The results for for the five year period before KDHS 2003 for transition from third to fourth birth showed that only region of residence, wealth index and age at the start of the interval were significantly associated with the odds of transition to a fourth birth. Women resident in Central province were associated with lower odds of transition to a fourth birth compared to women from Western province. The risk of transition to a fourth birth was lower for women from poorer, middle, richer and richest households compared to women from poorest households. Model 2 which included background and proximate variables showed that, region of residence, wealth index, age at the start of the interval, ever use of contraception and desire for another child were significant predictors of transition to a fourth birth. Women from Central province were associated with lower odds of transition to a fourth birth compared to women from Western province. This same pattern was observed for women from poorer, middle, richer and richest households, women those who had ever used a method of contraception and those who desired another child within two years. Age at the start of the interval was also associated with reduced odds of transition to a fourth birth.

Conclusions and Policy implications of study findings

The study began by hypothesizing that more educated women, those living in urban areas, those from Central province, currently married women and those women from wealthier households are less likely to transition from third to fourth births. We also hypothesised that women who have ever used a modern method of contraception, those who have never experienced a prior child and those who desired another child were less likely to transition from second from third to fourth births.

The results showed that the patterns of parity progressions didn't change significantly between the five year periods before the Kenya Demographic and Health Surveys of 2003 and 2008/9. This seems to agree with the prediction of Blacker (2002) and White et al. (2006) that given the prevailing conditions it was unlikely that Kenya was going to achieve replacement level fertility of below three births per woman.

Results from the multivariate analysis showed that for the five-period before KDHS 2008/9 the odds of transition from third to fourth birth was significantly associated with education level, wealth index, age at the start of the interval ever use of contraception and desire for more children. Women with secondary and above level of education were 63 percent less likely to experience a fourth birth compared to women with no education. Women from middle and richer households were 0.5 times less likely to experience a fourth birth whereas those from the richest households were 0.3 times less likely to experience a fourth birth compared to women from the poorest households. Age at the start of the interval was also significantly related with reduced odds of transition to a fourth birth. Women who had ever used a modern method of contraception and those who desired another within at least two years were associated with reduced odds of transition to a fourth birth. The results for the five-year period before KDHS 2003 for transition to fourth birth showed region of residence, wealth index, age at the start of the interval, use of contraception and desire for another child were significant predictors of the transition.

A major conclusion here for these results is that transition from third to fourth births in Kenya was strongly influenced by socio-economic, cultural and proximate factors. This supports the view that socio-economic conditions and diffusion hypotheses are important in fertility transition in Kenya. Consequently, at policy level there is need to improve family planning services across the country. This will go a long way in addressing the issues of unwanted and wanted fertility and hence lead to a decline in total fertility. The government has already instituted measures aimed at re-positioning family planning in the country. There is also need to improve the socio-economic conditions in the country. This is because relative wealth and more education are strongly associated with lower fertility. This means more efforts should be directed towards increasing the GDP per capita and increasing the proportion of women with secondary and above level of education. This is because education plays a key role in changing attitude and behaviour towards reproduction. An improved GDP per capita will provide more opportunities for employment, better health care and alternative investments besides children. This will ultimately impact on the desired family size and in the end lead to a decline in the actual fertility.

APPENDICES

Table 4: Logistic regression results for transition from third to fourth birth in the five year periods before the survey: KDHS 2008/9- Model 2: All variables

Variable	Exp(β)	S.E. (β)	P-value
Educational level			
No education(Ref.)	-	-	-
Primary education	0.519	0.184	0.064
Secondary plus	0.365	0.152	0.015
Residence			
Urban(Ref.)	-	-	-
Rural	1.182	0.413	0.632
Region of residence			
Western(Ref.)	-	-	-
Nairobi	0.969	0.564	0.957
Central	0.577	0.231	0.169
Coast	1.145	0.503	0.758
Eastern	0.525	0.196	0.085
Nyanza	0.735	0.259	0.381
Rift Valley	0.909	0.333	0.795
North Eastern	0.870	0.541	0.824
Marital status			
Never married(Ref.)	-	-	-
Currently married	1.855	1.475	0.437
Widowed/divorced	0.833	0.691	0.826
Religion			
Catholic(Ref.)	-	-	-
Protestant	1.210	0.307	0.452
Muslim	1.394	0.590	0.432
Other	0.714	0.432	0.478
Wealth index			
Poorest (Ref.)	-	-	-
Poorer	0.741	0.234	0.342
Middle	0.529	0.177	0.057
Richer	0.487	0.165	0.034
Richest	0.336	0.146	0.012
Age at start of interval	0.879	0.020	0.000
Ever use of contraception			
Never used (Ref.)	-	-	-
Used traditional	1.036	0.555	0.948
Used modern	0.546	0.156	0.034
Prior child death			
Alive (Ref.)	-	-	-
Dead	1.473	0.356	0.109
Desire for more children			
Wants no more (Ref.)	-	-	-
Wants within two years	0.335	0.122	0.003
Wants after 2 years	0.514	0.143	0.017

Table 5: Logistic regression results for transition from third birth to fourth birth in the five year periods before the survey: KDHS 2003- Model 2: All variables

Variable	Exp(β)	S.E. (β)	P-value
Educational level			
No education(Ref.)	-	-	-
Primary education	1.169	0.406	0.654
Secondary plus	1.015	0.440	0.973
Residence			
Urban(Ref.)	-	-	-
Rural	1.940	0.709	0.070
Region of residence			
Western(Ref.)	-	-	-
Nairobi	1.280	0.752	0.674
Central	0.395	0.153	0.016
Coast	0.468	0.228	0.119
Eastern	0.472	0.191	0.063
Nyanza	0.966	0.408	0.934
Rift Valley	0.882	0.334	0.741
North Eastern	3.890	3.697	0.153
Marital status			
Never married(Ref.)	-	-	-
Currently married	1.864	1.723	0.500
Widowed/divorced	0.851	0.816	0.866
Religion			
Catholic(Ref.)	-	-	-
Protestant	0.887	0.241	0.659
Muslim	1.349	0.697	0.562
Other	2.076	2.330	0.515
Wealth index			
Poorest (Ref.)	-	-	-
Poorer	0.408	0.153	0.017
Middle	0.351	0.128	0.004
Richer	0.422	0.165	0.027
Richest	0.310	0.150	0.016
Age at start of interval	0.909	0.026	0.001
Ever use of contraception			
Never used (Ref.)	-	-	-
Used traditional method	0.448	0.211	0.088
Used modern method	0.441	0.123	0.003
Prior child death			
Alive (Ref.)	-	-	-
Dead	1.343	0.325	0.223
Desire for more children			
Wants no more (Ref.)	-	-	-
Wants within two years	0.374	0.148	0.013
Wants after 2 years	1.288	0.404	0.419

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