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[LONG ABSTRACT]

Adolescent childbearing experiences in Kenya: geographical and socioeconomic determinants

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Aim of the paper

Analysing data from the 2003 Kenya Demographic and Health Survey we attempt to investigate the geographical and socioeconomic determinants of both teenage pregnancies and maternal health behaviours among adolescent women in Kenya. In addition, the DHS data set collects Global Positioning System locators for each of the primary sampling units (PSUs) included in the samples that enable a deep geographical analysis. Our aim is to ascertain the influence of the availability of health care facilities, in particular those oriented to the specific needs of motherhood and reproductive and sexual health.

Introduction

Improving maternal health has been established as a key development priority among the Millennium Development Goals (MDGs). Fifth Millennium Development Goal "*Improving maternal health*" is developed in two targets: 5A) Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio; 5B) Achieve, by 2015, universal access to reproductive health.
Protecting the health of mother and baby requires good antenatal care, skilled attendants, a safe place to give birth, access to emergency obstetric care (UNFPA, 2002). The diffusion of health facilities throughout developing countries surely represents a key factor to protect women's health during pregnancy and delivery.
Sub-Saharan Africa – with Latin America and the Caribbean - shows one of the highest level of teenage pregnancies. In spite of the persistence of this situation, the analysis which aim at investigate the determinants and the different diffusion of teenage sexual behavior and childbearing on a local scale are not so widespread until now. Some studies on this topic highlighted the presence of unmet reproductive health needs of adolescents in different regions. Nevertheless, upgrading reproductive and maternal health is usually associated with the eradication of inequality and poverty and with the presence of health care programs and services aimed at promoting girls' education and poverty alleviation. At the same time, many problems associated with childbearing could be alleviated with appropriate heath care during pregnancies.
Limiting adolescent fertility can be considered a priority for women living in world's developing regions. In many developing countries, poor women start bearing children between ages 15 and 19. Their higher levels of pregnancy reflect early marriage, less ability to negotiate delays in sex and reproduction, and less access to family planning. Each year, one in every ten births worldwide is to a mother who is herself still a child (Save the Children, 2004).
The most recent UNICEF Report (2009) outlines key aspects and consequences of early motherhood:
• Maternal deaths related to pregnancy and childbirth are an important cause of mortality for girls aged 15–19 worldwide, accounting for 70,000 deaths per year;
• The younger a girl when she becomes pregnant, the greater the health risks. Girls who give birth before the age of 15 are five times more likely to die in childbirth than women in their twenties;
• If a mother is under the age of 18, her infant's risk of dying in its first year of life is 60 per cent greater than that of an infant born to a mother older than 19;

• Even if the child survives, he or she is more likely to suffer from low birth weight, under nutrition and late physical and cognitive development.
• Additionally, early childhood interacts with schooling: childbearing (as child marriage) increases the risk that adolescent girls will drop out of school, with negative implications for maternal and newborn health and for future income-earning capacity (Lloyd, 2006; Bledsoe and Cohen, 1993; Taffa, Omollo and Matthews, 2003). This, in turn, contributes to the vicious cycle of gender discrimination, with poorer families being more disposed to permit the premature marriage of daughters out of economic necessity. On the other hand, the gains from education go beyond reducing the risk of maternal and newborn deaths and ill health.

Trends in adolescent fertility in Kenya

At the beginning of the XXI century, Kenya is one of the countries where adolescent fertility is reported to be among the highest in Africa.
Results from 2003 Kenyan Demographic and Health Survey show the stagnation in fertility, with a TFR of 4.9 children per woman for the three-year period preceding the survey (mid-2000 to mid-2003). Fertility – at every age - is considerably higher in the rural areas (5.4 children per woman) than in the urban ones (3.3 children per woman). This disparity in fertility is due to favourable factors most probably associated with urbanisation (e.g., better education, higher status of women, better access to family planning information and services and later marriage). Regional differentials in fertility are still large, and closely associated with regional disparities in knowledge and use of family planning methods (Opiyo, 2004).
After a decline observed at the end of the 80's (table 1), fertility in Kenya seems to have started rising, even if slightly, from 1998. This trend similarly regards adolescent fertility (15-19 years of age). Adolescent fertility in Kenya occupies a prime place in the design and implementation of reproductive health strategies, policies, and programmes.

Table 1 - Age-specific fertility rates (per 1,000 women) and total fertility rates from Kenyan selected surveys and censuses: 1977-78 KFS, 1989 KDHS, 1993 KDHS, 1998 KDHS, 1999 Population and Housing Census, and 2003 KDHS.

Age group	1977-78 KFS[1]	1989 KDHS	1993 KDHS	1998 KDHS	1999 Census	2003 KDHS	2003 KDHS	% change 1989-2003
	1975-78	1984-89	1990-93	1995-98		2000-03[1]	2000-03	
15-19	168	152	110	111	142	114	114	-25.0
20-24	342	314	257	248	254	241	243	-22.6
25-29	357	303	241	218	236	227	231	-23.8
30-34	293	255	197	188	185	193	196	-23.1
35-39	239	183	154	109	127	119	123	-32.8
40-44	145	99	70	51	56	55	55	-44.4
45-49	59	35	50	16	7	15	15	-57.1
TFR	8.1	6.7	5.4	4.7	5.0	4.8	4.9	-32.2

Note: Rates refer to the three-year period preceding the surveys, except for the 1989 KDHS, which uses a five-year period, and the 1999 census, which uses a period that varies with the age groups used to make the correction.
1: Excludes the northern part of the country. Sources: Opiyo, 2004

If we consider Kenya and its neighbouring countries in recent years (table 2) we see that the decrease of adolescent fertility between 1997 and 2007 presents a wide disparity. Kenya emerges as the country with the lowest decrease in the period, and a very high value still in 2007.
The percentage of women 20-24 years old who were married or in union before they were 18 years old is, on the contrary, higher in other sub-Saharan countries.

Table 2. *Demographic indicators of fertility and child marriage. Kenya and other Developing Countries*

	TFR 2007	Adolescent fertility		Child marriage 1998-2007*		
		1997	2007	Total	Urban	Rural
Developing Countries	2.8	124.3	103.0	36a	22a	46a
CEE/CIS	1.7	21.8	17.4	11	11	13
East Asia/Pacific	1.9	45.8	35.0	19**	12**	25**
Middle East/North Africa	3.0	95.2	67.0	18	12	23
South Asia	3.0	85.9	72.6	49	32	58
Latin America/Caribbean	2.4	133.8	117.7	-	-	-
Sub-Saharan Africa	5.2	105.7	103.5	40	25	48
Kenya	**5.0**	**133.3**	**130.4**	**25**	**19**	**27**
Tanzania	5.2	72.5	70.1	41	23	49
Somalia	6.1	111.5	104.4	45	35	52
Etiopia	5.3	85.5	56.8	49	27	55
Sudan	4.3	191.0	150.0	34	24	40
Uganda	6.5	124.3	103.0	46	27	52

Adolescent fertility : Births per 1000 women ages 15-19; * Child marriage**:** Percentage of women 20–24 years old who were married or in union before they were 18 years old. ** Excludes China; a excludes China and Nigeria.
Sources: UNICEF, 2009; WDI online, 2009.

Among the 1856 women aged 15-19 years at the 2003 DHS survey, 431 (23%) have already begun child-bearing. Sixty-four percent of them are currently married, and the percentages raise as age increases (tab. 3).

Table 3 - *Women ages 15-19 who have begun child-bearing. 2003 KDHS*

Age	Women already mothers		Women pregnant with first child		Women who have begun childbearing		Total number of women
	Number	% married	Number	% married	Total	% married	
15	8	62.5	6	50.0	14	57.1	351
16	19	42.1	11	54.5	30	46.7	360
17	44	63.6	15	60.0	59	62.7	365
18	121	57.9	31	80.6	152	62.5	397
19	151	70.2	25	56.0	176	68.2	383
Total 15-19	343	63.3	88	64.8	431	63.6	1856

Source: our elaborations on DHS data, weighted data.

Regional differences are particularly striking (tab. 4). Rift Valley, North Eastern and Coast Regions show, by far, the highest rates of adolescent childbearing; percentages are lower in Eastern and Central Regions. It is interesting to note that Rift Valley, North Eastern and Coast Regions present also the highest illiteracy rates, with a worrying situation for females (Kyalo Ndeng'e. 2004).

Tab. 4 - *Women ages 15-19 who have begun child-bearing by region. 2003 KDHS*

Region	% women who are already mothers	% women pregnant with first child	% women who have begun child-bearing	Total number of women 15-19
Nairobi	15.2	4.2	19.4	144
Central	13.5	1.7	15.2	230
Coast	23.5	6.2	29.7	145
Eastern	11.0	3.7	14.7	316
Nyanza	21.2	6.0	27.2	325
Rift Valley	25.6	5.3	30.9	390
Western	16.4	4.8	21.2	268
North Eastern	21.0	7.9	29.0	38
Kenya	18.5	4.7	23.2	1856
Country	343	88	431	

Source: our elaborations on DHS data, weighted data.

In table 5 concise data on adolescent fertility are included. Out of the 8,195 women interviewed in the 2003 KDHS, 3,565 (43.5%) gave their first birth before their twentieth birthday. Among them, 345 became mother before the age 15, when themselves were still children.
Data allow us to appreciate differentials and changes in early motherhood over time and between generations. Only slight changes seem to be verified. Among women aged 40-49 years at the time of the survey, the proportion of those who gave first birth by exact age 20 reaches 57%, compared with 44% of women aged 20-24.
The proportion of women without children at age 20 declines in the oldest cohorts. Data show that the percentage of women belonging to the oldest generations who have gave first birth by exact age 16 is almost twice that of more recent generations. This result can be mainly linked to the highest level of education of younger Kenyan women. As expected, higher education is strongly associated with lower fertility (Kyalo Ndeng'e, 2004). Notwithstanding this the proportions having their first birth by age 17 and 18 are quite similar for women aged 25 or more at the survey.
This observation is consistent with a constant or slightly rising age at first birth. Median age at first birth has largely remained the same or has slightly increased; the same trend emerges for the age at first marriage (Opyio, 2004).

Table 5 - *Among all women, percentage who gave first birth by exact age, and median age at first birth, by current age, Kenya 2003*.

	Percentage who gave first birth by exact age						Women (%) who have not given birth by exact age 20	Total number of women	Median age at first birth
Current age	15	16	17	18	19	20			
15-19	1.5	-	-	-	-	-	-	1856	-
20-24	3.4	5.6	13.1	21.4	32.1	44.1	55.9	1691	-
25-29	4.4	8.4	14.0	25.0	36.4	48.4	51.6	1382	20.1
30-34	5.7	10.9	19.4	30.7	42.7	54.9	45.1	1086	19.6
35-39	6.1	11.4	18.9	27.8	39.0	50.8	49.2	871	19.9
40-44	5.7	10.6	18.6	31.5	44.6	57.0	43.0	788	19.4
45-49	7.5	14.7	22.2	33.5	47.1	57.1	42.9	521	19.3
N. of women	345	311	533	764	839	771		8195	

Sources: our elaborations on KDHS data; weighted data.

As introduced by Villareal (1998) the study of early childhood in Kenya is complex: sexual customs varies greatly among ethnic groups, with differing values on virginity, consequences of premarital pregnancy, practice of genital mutilation, level of knowledge and use of contraception, among other characteristics.
Cultural factors may influence teenage motherhood and reproductive health behaviour in addition to socio-economic aspects (Schwab Zabin and Kiragu, 1998; Gage, 1998). The problem of teenage pregnancies should be analysed taking account of the socio-economic and socio-cultural environment in which the adolescents live and grow up (Were, 2007; Lloyd, 2006; Bledsoe and Cohen, 1993, Ocholla-Ayayo, Wekesa and Ottieno,1993).
To better perceive factors that influence the risk of teenage fertility and adolescent reproductive behaviour, we consider both individual/household socio-economic characteristics and community characteristics. One of the most important is represented by the diffusion of health facilities throughout the country (Stephenson *et al.*, 2006).
Individual/household socio-economic characteristics and data on health facilities allow us to investigate the geographical diffusion and the determinants of both teenage pregnancies and maternal health behaviours among adolescent women in Kenya. Our aim is to ascertain the influence of the availability of health care facilities in general and those oriented to the specific needs of motherhood and reproductive and sexual health.
First of all we attempt to ascertain the differential diffusion and the determinants of early motherhood in the various regions of the country. In a second step we consider the adolescents who

gave birth at age 19 or younger (married and unmarried at the time their first baby was born) to identify determinants of their reproductive health behaviour.
Another problem Kenyan women face with is represented by unsafe abortion, to prevent which the availability of health facilities is crucial. More than 40% of births in Kenya are unplanned, and one in four married women have an unmet need for contraceptives. Among adolescents aged 15-19 the percentage of births that are unplanned in 2003 raises to 46.6%. A large national-level study of women admitted to public hospitals in 2002 for abortion-related complications showed that patients were diverse in age, and among them also adolescent women were included. Sixteen percent of women were in their teens (Biddlecom, 2008).

As introduced, the main sources of data are represented by 2003 Kenyan Demographic and Health Survey. In addition, the DHS data set collect Global Positioning System locators for each of the primary sampling units (PSUs) included in the samples that enable a deep geographical analysis (Agwanda *et al.,* 2004; David and Haberlen, 2005). Other community variables such as the presence of health care facilities by typology together with their distance from the PSUs are used.

We perform a multivariate multilevel analysis to estimate the influence that individual-, household-, and community-level factors have on the risk of adolescent childbearing. In addition we use a spatial component taking into account the presence and proximity of maternal health services.
Our intent is to produce maternal health service utilisation maps for pregnancy, childbirth and postpartum heath behavior in Kenya and to correlate them to the presence of health care facilities in the area according to the real distance among the sampling territorial units (clusters) and the facilities.
The role of the community variables in the analysis of adolescent childbearing and reproductive health behaviors constitute an opportunity to highlight health risks associated with particular social structures, community ecologies and heath facilities, providing a policy tool for the improvement of public health interventions.
We expect that both the presence and accessibility of reproductive health services act together with levels of economic development, individual and household characteristics and community fertility norms in influencing individual reproductive behavior in very young ages.

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