CHANGES IN THE FACTORS AFFECTING FERTILITY IN GHANA DURING THE EARLY STAGES OF THE FERTILITY DECLINE

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A substantial decline in fertility levels in Ghana has occurred since the mid 1980s. This study uses data from the 1988 and the 1993 Ghana Demographic and Health Surveys to analyse the changing importance both of the proximate determinants of fertility and of demographic, socio-economic, cultural, and locational factors affecting fertility in this West African country. The rising level of contraceptive use is found to be the main proximate cause of the decline in fertility. A woman's age, education, religion, place of residence and child mortality experience are found to be important factors affecting fertility indirectly. The most significant change in Ghanaian fertility has been between the decline in fertility in urban areas outside the Greater Accra region.

1. INTRODUCTION

Data from the 1993 Ghana Demographic and Health Survey (GDHS) show that a sizeable decline in fertility levels occurred in this West African country between the mid 1980s and early 1990s: the Total Fertility Rate (TFR) for this survey of 5.5 births per woman is 0.9 lower than that recorded for the 1988 GDHS (Ghana (1994)). This is the first clear indication of a sizeable decline in national-level fertility in this country. Birth history data from both the 1988 and the 1993 GDHS both show that changes in fertility levels in the early 1980s were very slight (Ghana (1989, 1994). The fluctuations in fertility during the 1970s indicated by figures from the 1971 Supplementary Enquiry, birth history data from the 1979-80 Ghana Fertility Survey (GFS), and birth history data from the 1988 GDHS were also fairly slight and, in the light of inconsistencies between data from different sources for the same time periods, in part may be an artefact of errors in the data (Ghana (1983,1989)).

The change in Ghanaian fertility levels since 1988 has been accompanied by rising levels of contraceptive use, a rising proportion of women preferring a small family size and growing urban-rural and inter-regional fertility differentials (Hollander (1995)). Between the 1988 and 1993 surveys the TFR declined in the Greater Accra, Eastern, Western, Central, Ashanti, Brong-Ahafo, and Volta regions (Table 1). In the first four of these regions fertility decline may be seen as a continuation of the decline that occurred between the 1979-80 GFS and the 1988 GDHS, whilst in Brong Ahafo and Volta regions the decline in the TFR since 1988 represents a reversal of the increase between 1979-80 and 1988 (Ghana (1983,1989,1994)).

The unprecedented decline in Ghanaian fertility between the mid 1980s and early 1990s follows unprecedented declines in fertility having been recorded during the 1980s in Kenya (Kenya (1989)), Botswana (Botswana (1989)) and Zimbabwe (Zimbabwe (1989)). In much of the rest of Sub-Saharan Africa evidence of fertility decline has been either mixed or non-existent (Lockwood (1995)). This paper examines changes in the factors affecting fertility in Ghana, using data from the 1988 and 1993 GDHS.

Table 1 about here

2. DATA AND METHODS

The 1988 and 1993 Ghana Demographic and Health Surveys both used stratified cluster sampling designs. Both surveys collected data on fertility, fertility regulation, marriage and sexual activity, fertility preferences and infant mortality and health from women aged between 15 and 49. The numbers of women interviewed were 4,488 for the 1988 GDHS and 4,562 for the 1993 GDHS (Ghana 1989, 1993).

Changes in fertility levels reflect changes in sexual behaviour, in the probabilities of sexual intercourse leading to conception and in the probabilities of conceptions leading to live births. According to Bongaarts (1978) and Bongaarts and Potter (1983) changes in national-level "marital" fertility can be largely attributed to in the prevalence of relatively stable sexual unions ("marriages"), use of contraception, induced abortion and postpartum non-susceptibility. They proposed indices (C_m , C_c , C_a and C_i respectively) to measure the fertility-inhibiting effects of these four variables. An index of 1 would indicate the variable having no fertility-inhibiting effect, whilst an index of 0 would indicate the variable reducing fertility to zero. In both the GFS and in the 1988 and the 1993 GDHS, no information on induced abortion was collected because of the sensitivity of this subject. Hence, it was not possible to calculate the values of the index for fertility-inhibiting effects of abortion.

Demographic, socio-economic and cultural and locational factors affect fertility through their effects on the proximate determinants. For both the 1988 and the 1993 GDHS the effects of such factors on fertility in Ghana were assessed by conducting random effects logistic regression analyses of whether or not a Ghanaian woman had given birth in the year prior to the date of interview. Both analyses were restricted to women aged 15-44 last birthday, because many women in the 45-49 age group are infecund. To facilitate comparison, both analyses used the same set of explanatory variables.

The demographic variables included in the analyses were the woman's age, the number of children she produced had that were dead at the time of interview and the number of children she had that were still alive. A woman's age, represented by dummy variables for five years age groups, was included as an explanatory factor in the analysis because a woman's fecundity, marital status and reproductive motivations all vary with her age. The number of children a woman has produced which have died was included as an explanatory variable in the analysis because, in sub-Saharan African countries such as Ghana, a frequently cited reason for having many children is the need to ensure that one is not left without surviving children as a result of children dying (Caldwell and Caldwell (1987, 1990)). Women with a history of infant and child deaths would, in some cases, try to produce children to replace the children who have died. Moreover, past infant and child deaths make a woman mindful that in the future some of her children may die and, hence, that she must produce many children to ensure she is not left childless (Lee and Bulatao (1983)). The number of surviving children a woman had was included in the analysis to test whether women with a large number of surviving children are more likely to restrict their fertility. In order to avoid their overlapping with the response variable, both the number of dead children and the number of surviving children were calculated for the start of the year before the date of interview.

The highest level of education of a woman was included as an explanatory variable because more educated women are more likely to postpone marriage and childbearing and to aspire to a smaller family size (Cochrane (1979, 1983), Acsadi and Johnson-Acsadi (1990)). The cultural variables included in the model represented a woman's religion and her ethnicity. Traditional Ghanaian religious and cultural beliefs tend to be strongly pronatalist, and vary between areas and ethnic groups (Caldwell and Caldwell (1987, 1990), Nukunya (1992)). Locational variables representing the region in which a woman lived and whether a woman lived in an urban area or a rural area also were included in the analysis.

Both the 1988 and the 1993 GDHS used two-stage cluster samples. It is likely that residuals from the same cluster would exhibit a positive intra-cluster correlation because of similarities in the characteristics and experiences of women living in the same area. A random effect for cluster has been included in the analysis to measure the extent of the intra-cluster correlation of residuals and, by doing so, to improve the estimation of standard errors of coefficients. The software package Mln (Rasbash and Woodhouse (1995), Woodhouse (1995)) was used for the analysis.

3. RESULTS

Proximate Determinants of Changing Fertility Levels in Ghana

The values of the three Bongaarts' indices that could be calculated using the GFS and the 1988 and 1993 GDHS data show that in Ghana in all three periods the most important fertility inhibiting factor is postpartum non-susceptibility (Table 2). The long durations of postpartum non-susceptibility in Ghana reflect that periods of postpartum amenorrhoea and of postpartum sexual abstinence tend to be lengthy. There is some double counting in the fertility-inhibiting effects of contraceptive use and postpartum non-susceptibility: some women are "double protected" due to their being postpartum non-susceptible and also using contraception. In the 1988 survey 3.5% of married women (27.6% of married women using contraception) and in the 1993 survey 2.8% of all married women (13.9% of married women using contraception) were double protected.

Between 1979-80 and 1988 there was almost no change in the indices for the proximate determinants of fertility. Between 1988 and 1993 the effect of changing proportions of women in each age group who were married and changing durations of postpartum nonsusceptible periods on fertility again were slight, but there was a significant rise in the fertility-inhibiting effect of contraceptive use. During this period the Total Marital Fertility Rate declined by 9%(from 7.4 to 6.7). Thus, almost all of the decline in marital fertility can be accounted for by 8% decline in the index for contraceptive use. The slight discrepancy may be due to the slight decline in the extent to which contraception is used in the postpartum nonsusceptible period.

Table 2 about here

Demographic, socio-economic, cultural and locational factors affecting fertility during the early stages of the fertility decline

The results of the analyses of the demographic, socio-economic, cultural and locational factors affecting fertility for the 1988 and 1993 GDHS are broadly consistent (see Table 3). In both analyses a woman's age is the single most significant predictor of fertility, with a woman's education and religion also being significant predictors. The coefficients for age follow an n-shaped pattern, being lowest for the 15-19 age group and the 40-44 age group and highest between ages 20 and 34. In both 1988 and 1993 the probability of a woman giving birth tends to increase with the number of child deaths she has experienced, although for the 1993 survey the size of this effect is within the margin of sampling variation. In both surveys there is an n-shaped relationship between the number of surviving children a woman has and her fertility, with women with 1-4 children having higher fertility than women with no children and women with five or more surviving children. However, in both surveys this effect is slight and not statistically significant.

In both 1988 and 1993 women with at least secondary-level education had significantly lower fertility than women with no education or women who had been educated to primary-level only. In both surveys the effect of primary-level education as opposed to no education was negative but not significant. The magnitude of the coefficient for the effect of a woman having secondary-level or higher education is larger for 1993 than for 1988, although sampling variation cannot be ruled out as a cause of this change.

In both 1988 and 1993 Christian women have significantly lower fertility than do their non-Christian counterparts. However, for both surveys, after controlling for other variables, the fertility levels of the other ethnic groups do not differ significantly from that of the majority group, the Akans.

There are some noticeable differences between the effects of the locational variables in the two models. In both surveys, after controlling for other variables, residence in an urban area is associated with lower fertility than residence in a rural area. However, for the 1988 data the difference is slight and not significant at the 5% level, whereas in the 1993 survey the contrast is far greater and is statistically significant. In 1988 residence in the Greater Accra region remains a significant predictor of fertility after controlling for other variables, whilst in 1993 the difference between the Greater Accra region and the other regions is slight and not significant after controlling for other variables. These changes reflect that the sharpest declines in fertility levels between 1988 and 1993 occurred in urban areas outside the Greater Accra region. In 1988 fertility levels in Accra, Tema and Kumasi were substantially lower than those in other urban areas. In 1993 the differences were considerably smaller.

Both for the model of the 1988 data and for the model of the 1993 data the variance of the cluster effects was estimated to be zero. This occurred because both in 1988 and 1993 the within-cluster correlation of fertility levels in Ghana has been accounted for entirely by between-cluster differences in the values of explanatory variables used in the models.

Table 3 about here

4. CONCLUSIONS

The recent sharp decline in fertility in Ghana can be a decomposed into changes due to the proximate determinants of fertility and into changes due to indirect factors affecting fertility[1]. In terms of the former, the decline in fertility in Ghana undoubtedly is due to rising levels of contraceptive use. The increased vigour with which family planning has been promoted in Ghana is a factor behind this.

Lower national-level fertility can reflect fertility declines within some (or all) subgroups of the population and, even when fertility levels within subgroups remain unchanged, to low fertility subgroups of the population forming larger proportions of the total population. From examining the models that relate demographic, socio-economic, cultural and locational factors to fertility in Ghana 1988 and in 1993 we see that the subgroups of the population in which most notable changes in fertility have occurred are those defined by the locational variables. Such changes largely reflect the widening gap between the fertility levels of urban areas outside the Greater Accra region and fertility levels in rural areas. These changes cannot be attributed to changes in the education levels of women of reproductive age or to changes in child mortality levels. It may well be that the impact of family planning programs has been particularly pronounced in urban areas outside the Greater Accra region.

The models of fertility show that low fertility subgroups of the population are women with secondary-level female education, Christian women, women who reside in an urban area and women who have experienced relatively few child deaths. The 1993 GDHS sample differs from that for the 1988 GDHS in that it has a higher proportion of women with secondary-level or higher education, a higher proportion of women living in urban areas and a lower mean number of child deaths per woman than the 1988 sample. This points to the movement of more educated cohorts through the reproductive ages, the urbanisation of the population and the decline in child mortality all being factors related to decline of fertility in Ghana.

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[1] An alternative approach to the one adopted in this paper would have been to use the analytic framework proposed by Easterlin and Crimmins (Easterlin and Crimmins (1985), Bulatao and Lee (1983)). The Easterlin and Crimmins framework represents the effects of factors on fertility in terms of their effects on the demand for children, on the supply of children and on the costs of fertility regulation. Translation of the concepts of demand for children, supply of children and fertility regulation costs into the Ghanaian context would need to consider aspects of the familial context of child "consumption" and "production" in this West African country, such as the prevalence of polygynous spousal relationships, bilocal spousal residences and child fostering, and is beyond the scope of this paper.

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Table 1: Total Fertility Rates By Region and for the 1988 and 1993 Ghana Demographic and Health Surveys

Region	Total Fertility Rate(*)	
	1988 GDHS	1993 GDHS
Western	6.5	5.5
Central	6.8	5.6
Greater Accra	4.8	3.6
Volta	6.3	5.4
Eastern	5.9	5.1
Ashanti	6.3	5.6
Brong-Ahafo	7.2	5.5
Northern	8.1	7.4
Upper East	5.7	6.4
Upper West	7.5	6.0
Ghana	6.4	5.5

(*) Based on births 0-4 years before survey to women aged 15-49

Table 2: Values of Bongaarts Indices for the 1979-80 Ghana Fertility Survey and for the 1988 and 1993 Ghana Demographic and Health Surveys

Bongaarts Index	1979-80 GFS	1988 GDHS	1993 GDHS
Cm	0.75	0.75	0.74
Cc	0.92	0.90	0.83
Ci	0.60	0.58	0.58

Table 3: Logistic Regression Analyses of Whether a Woman Gave Birth in the Last 12 Months: 1988 and 1993 Ghana Demographic and Health Surveys.

Variable	1988		1993	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-1.99*	0.19	-1.92*	0.20
Age				
15-19	0.00			
20-24	0.88*	0.15	0.83*	0.16
25-29	0.96*	0.17	0.81*	0.17
30-34	0.79*	0.18	0.82*	0.19
35-39	0.61*	0.20	0.29	0.21
40-44	0.00	0.24	-0.17	0.24
Education				
None	0.00			
Primary	-0.14	0.10	-0.11	0.10
Secondary+	-0.48*	0.19	-0.60*	0.19
Religion				
Christian	0.00			
Muslim	0.47*	0.16	0.25	0.15
Other/None	0.21	0.11	0.28*	0.12
Ethnicity				
Akan	0.00			
Ga-Adangbe	0.20	0.17	0.02	0.18
Ewe	-0.16	0.16	-0.19	0.17
Guan	-0.29	0.30	-0.16	0.29
Mole-Dagbani	-0.25	0.19	-0.13	0.18
Other	-0.21	0.18	-0.13	0.19
Region				
Western	0.00			
Central	-0.14	0.18	0.11	0.19
Greater Accra	-0.42*	0.21	0.13	0.21
Eastern	0.00	0.17	-0.04	0.19
Volta	0.33	0.22	0.15	0.22
Ashanti	0.09	0.16	0.25	0.17
Brong Ahafo	0.27	0.17	-0.17	0.19
Northern/ Upper	-0.07	0.21	0.09	0.21
Type of Place of Residence				
Rural	0.00			
Urban	-0.13	0.10	-0.48*	0.10
Number of Dead Children	0.11*	0.05	0.06	0.06
Number of Living Children				
0	0.00			
1-4	0.22	0.12	0.16	0.13
5+	-0.03	0.18	0.02	0.19

*Indicates coefficient is significant at the 5% level