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Mass Media Promotion of Family Planning and the Use of Modern Contraception in Ghana

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Abstract:

Fertility in Ghana has fallen sharply in recent years, with the rate of decline being one of the most rapid in Sub-Saharan Africa. Ghana's fertility decline has coincided with an increase in the percentage of women of reproductive age reporting exposure to family planning messages via the media, a rise in the education of women of reproductive age, and a decline in under five mortality. This paper presents a multilevel, multinomial analysis of the 1998 Ghana Demographic and Health Survey data to investigate the effects of exposure to family planning messages on the type of method of contraception a woman uses. A multilevel logistic model is used to investigate the effects on fertility. The results show exposure to family planning messages via the radio and printed sources substantially increase use of modern contraception. Secondary-level education, urban residence, a large number of surviving children, and being aged 20-34 are other factors associated with increased use of modern contraception. However, exposure to family planning messages appears not have significant effects on fertility.

Introduction

Fertility has fallen markedly in Ghana in recent years, with the rate of decline being among the most rapid in sub-Saharan Africa. The first substantial decline at the national level occurred between the mid-1980s and the early 1990s (Ghana Statistical Service 1994; Parr 1998). Ghana's fertility decline began roughly twenty years after the decline in fertility for black South Africans, which began in the 1960s and accelerated in the 1970s (Caldwell and Caldwell 1993). Large and rapid fertility declines also had emerged during the 1980s and 1990s in Botswana, Kenya and Zimbabwe (Botswana Central Statistics Office and IRD 1989; Robinson 1992; Central Statistical Office 1994; Blanc and Rutstein 1994; Zimbabwe Central Statistical Office and Macro International, NCPD et al. 1999). Much slower declines in fertility in Cameroon and Senegal appear to have been sustained over a similar period (Salif Ndiaye et al. 1997; Fotso et al. 1999). In the 1990s evidence of significant national level reductions in fertility emerged for several other sub-Saharan African countries, including two other West African states; Cote d'Ivoire and Togo. However, Ghana's total fertility rate (TFR) in 1998 of 4.6 births per woman is still comfortably the lowest recorded national level of fertility in West Africa.

Trends in Factors Affecting Fertility

The reduction in Ghanaian fertility has been accompanied by a rise in the use of modern contraception, a move away from marriage, and a shortening of postpartum insusceptibility [1]. However, for each of these proximate determinants of fertility the Ghana Demographic and Health Survey (GDHS) data suggest an uneven, stepped pattern of change rather than a linear one (Table 1). Although the percentage of Ghanaian women of reproductive age who were using a modern method of contraception rose appreciably between 1988 and 1993, the results of the 1998 GDHS suggest only a slight increase occurred between 1993 and 1998, a trend difficult to reconcile with the substantial drop in fertility between these dates (Ghana Statistical Service 1989, 1994, 1999). The surprisingly low rates of use of modern contraception recorded by the GDHS may be affected by underreporting, because women either fear the reaction of their husband and the extended family, or at least would prefer to avoid the criticism, or even ridicule, that they or their husbands may face if their use of contraception (and the associated infidelity or premature resumption of postnatal sexual relations) became known in the community (Addai 1999, Awusabo-Asare and Anarfi 1997; Bawah et al. 1999). Indeed the popularity of using contraceptive injections among Ghanaian women may in part be attributable to women being able to use this method without their husband, his family or the community knowing about it.

The percentage of women who are currently married [2] changed little between 1988 and 1993, but fell markedly between 1993 and 1998 (Ghana Statistical Service 1989, 1994, 1999). The reduction in the prevalence of marriage reflects both an increase in the percentage of women of reproductive age who have never married and an increase in the percentage of women who have not repartnered following a marital dissolution, with the former accounting for a majority of the change. Increased premarital sexual activity, increased male and female participation in education, the economic hardship felt

by many men, and an apparent unwillingness of some men to accept family responsibilities are factors behind this move away from marriage (Mensch et al. 1999).

The change in median duration of postpartum insusceptibility between 1988 and 1993 was slight, but a marked drop is evident between 1993 and 1998 (Table 1). Some of the reduction in the median duration of postpartum sexual abstinence is due to contraception being adopted as an alternative means of ensuring birth spacing. Awusabo-Asare and Anarfi (1997) suggest that rising HIV/AIDS prevalence in Ghana may also be a factor, because some women may resume sexual activity with their husband early to reduce the likelihood of him seeking sexual intercourse elsewhere.

The decline in total fertility in urban areas has been almost double the decline in rural areas. Between the 1988 and 1993 GDHS the reduction in fertility was more marked among the more educated women than among women with primary level or no education, but since 1993 a substantial reduction in fertility has been common to women of all levels of education. A substantial change in fertility preferences is evident from the GDHS data (Table 2). The percentage of women with a preference for two or three children increased dramatically from 10 per cent in 1988 to 30 per cent in 1998, whilst the percentage of women with a preference for six or more children or who gave a non-numeric response declined considerably (Ghana Statistical Service 1989, 1994, 1999). Whilst preference for a small family size is more widespread in urban areas than in rural areas, qualitative data collected in the Kassena-Nankana area illustrate lucidly that a preference for a small family size is now evident even among some residents of a predominantly rural and traditional region of northern Ghana (Adongo et al. 1998).

One of the most marked changes coinciding with Ghana's fertility decline has been the increase in the exposure to family planning messages via the media. The percentage of women who had heard family planning messages via the radio increased from 35 in 1993 to 51 in 1998, whilst the percentage who had seen family planning messages of television rose from 22 in 1993 to 34 in 1998 (Table 3). A substantial increase in the ownership of electrical goods can partly account for these changes. The percentage of households possessing a radio increased from 41 in 1993 and 50 in 1998, whilst the percentage living in a household with a TV increased from 13 in 1993 to 21 in 1998 (Ghana Statistical Service 1994, 1999). The 1998 GDHS found that 11 per cent of women had read a family planning message in a newspaper or magazine. Almost a third (33 per cent) had seen a poster promoting family planning, but only 8 per cent had read a brochure or a leaflet promoting family planning (Ghana Statistical Service 1999). Other important sources of information about family planning in Ghana are community drama, health and family planning workers, and friends and relatives. Condom promotion aimed primarily at preventing the spread of AIDS has become an increasingly prevalent form of family planning promotion. The magnitude of the increase in exposure to family planning messages in Ghana, coupled with the importance of this factor as a determinant of contraceptive use and fertility in other sub-Saharan African contexts [3], provide compelling reasons to study the effects of this factor in the context of Ghana's fertility decline.

Several other changes that might contribute to the explanation of the substantial reduction in fertility over this period are demonstrated by the GDHS data. The levels of education of women of childbearing age increased substantially, whilst the mortality rate of under fives declined markedly (Table 3). The percentage of respondents who live in an

urban area rose between the 1988 and 1993 surveys, but was slightly lower for the 1998 survey than for 1993.

The increase in women's education, particularly the increase in the percentage of women with secondary level or higher education, may have contributed to the reduction in fertility, because women pursuing an education will try to prevent the disruption of their plans that would result from pregnancy or childbirth, and because more educated parents are more likely to aspire for their children to be well educated and restrict their family size to ensure that adequate funds are available for this purpose. Even the well educated who are well off may restrict their fertility in order that their children can benefit from being sent to best (and most expensive) schools.

The cultural importance of having adequate numbers of surviving children, sons and daughters, and, above all, of avoiding being childless, has been well-documented (Caldwell and Caldwell 1987, 1990). However, recent research in the Kassena-Nankana area in the Upper East region demonstrates that traditional religious messages regarding fertility behaviour can be influenced by the prevailing social and economic climate (Adongo et al. 1998). Increased rates of child survival may explain some of the reduction in fertility, because fewer additional children are seen as necessary to ensure being without surviving children and reaching an adequate number and mix of survivors. Furthermore, the curtailment of breastfeeding, amenorrhoea and postpartum sexual abstinence due to infant death is reduced as rates of infant and child survival increase.

The urbanisation of the population may explain some of the reduction in fertility, because urban dwellers are more likely to restrict their fertility in order that their children can be educated and provided for adequately. Moreover, moves by young rural dwellers to find employment in the urban cash economy may reduce fertility rates in rural areas, because parents are less certain that in the future children will be source of farm labour and support in old age (Phillips et al 2000).

This study examines empirically the effects of women's exposure to family planning messages by a range of different media, their education, child mortality and survivorship experiences, place of residence, religion and ethnicity on their propensity to use modern contraception or traditional contraception, using data from the 1998 GDHS [4]. Particular attention is paid to the effects of family planning promotion by radio, television, newspapers or magazines, or posters, brochures or leaflets. The study also analyses whether these effects translate into effects on a woman's fertility, and discusses the implications of the findings for the explanation of Ghana's fertility decline.

Data and Methodology

The 1998 Ghana Demographic and Health Survey Data

The 1998 GDHS interviewed 4483 women aged 15 to 49 years from 6,003 households about their fertility, use and knowledge of family planning, child health, nutrition and mortality, breastfeeding and maternity care and awareness of AIDS and STDs. The interviews were completed between November 1998 and February 1999 (Ghana Statistical Service 1999). The nationally representative stratified, two-stage cluster sample design for the 1998 GDHS collected data from 400 census enumeration areas.

Methodology

Cross-tabulations are presented to describe the extent to which the use of different types of contraception differs between women who have been exposed to family planning messages by radio, television, newspapers or magazines, and posters, brochures and leaflets and women without such exposure. Differentials in exposure to family planning messages via these four types of media and by demographic, socio-economic, cultural and locational variables are described, as are differentials in contraceptive use by type of method. A multivariate, multilevel, multinomial logistic regression analysis is presented to measure the effects on the odds of a woman currently using a modern contraceptive method and on the odds of her using a traditional method of contraception (relative to the baseline category - using no method of contraception) are affected by exposure to family planning messages via the radio, television, newspapers or magazines, and posters, brochures or leaflets, after controlling for other variables likely to affect contraceptive use. The control variables used are; a woman's age, her highest level of education, whether she lives in an urban area or a rural area, the region in which she lives, her religion, her ethno-linguistic group, her number of surviving children, and the number of children she has given birth to that are now dead. The number of surviving children and the number of dead children are treated as continuous variables. Exploratory analyses showed modeling the effects of these variables as linear effects to be appropriate. The other explanatory variables are treated as categorical variables. For parsimony's sake some of the categories of variables available in the DHS data set have been combined, subject to the combined category being substantively coherent and the differences between the effects of the original sub-components being not statistically significant (for example the Asante, Akwapim, Fante and other Akan were grouped together as "Akan"). Random effects for cluster of residence are estimated to measure the between cluster variances of residuals, and to improve the accuracy of the assessment of the significance of coefficients and related goodness-of-fit statistics (Holt and Ewings 1989; Parr 1999). The formulation of the model used is :

$$\ln(r_{ijs}) = \beta_s X_{ij} + u_{js} \quad s = 1, 2$$

Where

r_{ijs} is the ratio of the probability that woman i in community j is using contraceptive method type s to the probability she is not currently using any method of contraception

X_{ij} is a vector of explanatory variables for woman i in community j

β_s is a vector of parameters for method type s

u_{js} is the value of the random effect for community j for method type s (Goldstein 1995; Steele et al. 1999; Yang et al. 2001).

Differentials in fertility levels by exposure to family planning messages via the four types of media and by background variables also are presented. A multilevel, logistic analysis of a measure of current fertility is used to analyse whether the effects of the explanatory variables on contraceptive use translate into effects on fertility. The measure of current fertility analysed is a binary variable; whether a woman gave birth in the 12 months before she was interviewed. The coefficients of the analysis may be affected to

some degree by reverse causality, because the response variable was measured over a period of time that precedes the point in time at which most of the explanatory variables were measured. However, restricting the time period over which fertility was measured to one year before the survey, rather a longer period, should minimise such effects. The explanatory variables used are identical to those used for the analysis of contraceptive use, except that, in order to avoid an overlap with the response variable, the number of surviving children and the number of child deaths have been calculated for the start of the year before the interview. The formulation of this model:

$$\ln \frac{\pi_{ij}}{1 - \pi_{ij}} = \beta X_{ij} + u_j$$

where

π_{ij} is the probability that woman i in community j gave birth in the last year

X_{ij} is a vector of characteristics of woman i in community j

β is a vector of parameters

u_j is the value of the random effect for community j

(Goldstein 1995).

Results

Differentials in Exposure to Family Planning Messages, Contraceptive Use and Fertility

Women who have heard or seen family planning messages via the radio, television, newspapers or magazines, or posters, brochures or leaflets are considerably more likely to be using modern contraception than women who have not heard or seen such messages (Table 4). However, differences in rates of use of modern contraception between women with different types of media exposure to family planning messages are slight. Women who have been exposed to family planning messages via the television or via newspapers or magazines also are considerably more likely to be using a traditional method of contraception than women who have not been exposed. Some of the correlation between exposure to family planning via posters, brochures or leaflets and contraceptive use is due to the exposure of contraceptive users to posters, brochures and leaflets at hospitals, family planning clinics, pharmacies, drug stores and other sources of contraceptive supply.

The percentage of women who have given birth over the last year is lower among women who have been exposed to family planning messages by the radio, television or newspapers or magazines than among women who have not been exposed to them. The small number of women who have seen messages about family planning in newspapers or magazines have a particularly low level of fertility. The fertility of women who have seen information about family planning on a poster or in a brochure or leaflet differs little from the national average. This in part reflects that some of the exposure to posters, brochures or leaflets occurs when women attend antenatal or postnatal classes; fertility causes some exposure to family planning posters, brochures and leaflets. Thus, the effect that seeing family planning posters, brochures or leaflets has in reducing fertility is offset

by the effect fertility has in increasing exposure to these types of family planning messages.

Some of higher use of modern contraception and the lower fertility of women who have been exposed to family planning messages via the media may be attributable to their tending to have other characteristics that are associated with relatively high levels of use of modern contraception use and relatively low fertility. For example, Table 5 shows that exposure to family planning is markedly greater among more highly educated women than among less educated women. Differences in literacy rates are a factor behind the greater exposure to family planning messages via the visual media of the more educated. The greater wealth and hence ability to afford of radios, televisions, newspapers and magazines of the more educated would be another factor. As women's highest level of education increases, use of modern contraception increases and fertility declines (Table 4). Thus, some or all of the higher use of modern contraception and lower fertility of women who have been exposed to family planning messages may be attributable to their educational profile.

Exposure to family planning messages is far greater among women who live in an urban area than among rural women. The higher percentages of women who live in households that have a radio or a television and the greater availability of newspapers and magazines in urban areas are reasons for the greater exposure of urban women to family planning messages via these media. The higher use of modern contraception and lower fertility of urban women (Table 4) may explain some of the higher use of modern contraception and lower fertility of women who have been exposed to family planning messages, and vice versa.

Exposure to family planning messages is considerably greater among residents of the Greater Accra region, the region with the highest levels of use both of modern and traditional methods of contraception and the lowest fertility, than in the other regions of Ghana. The particularly low fertility of women who have been exposed to family planning messages by newspapers or magazines would in part be attributable to their concentration in the Greater Accra region. Women in Ashanti region also have relatively high levels of exposure to family planning messages, with exposure via the radio or television in Kumasi being much higher than in other parts of Ashanti. Brong Ahafo is the region with the highest percentage of women who have seen posters, leaflets or brochures promoting family planning. Women in the Northern, Upper East, Upper West and Volta regions tend to have relatively low levels of exposure to family planning messages. Low rates of use of modern contraception and traditional methods of contraception and high fertility are found in the first three of these regions (Table 4). The regional pattern of exposure to family planning messages via radio and television reflects regional differences in the range of radio and television stations whose broadcasts can be accessed, as well as regional differences in the prevalence of radios and television sets. The low levels of reported exposure to family planning messages in the north of the country may be partly due to some broadcasts being in languages which are understood by only a minority of the population, for example Hausa.

Of the main religious groups, women with a primary allegiance to Christianity have the greatest exposure to family planning messages via each of the four media types. Women with traditional beliefs, other non-Christian, non-Islamic religions, or no religion have the least exposure to family planning messages by radios, televisions and posters,

brochures or leaflets. However, Muslims have the least exposure to family planning by newspapers or magazines. There are fairly large differences in exposure to family planning between ethno-linguistic groups, with Akan and Ga-Adangbe women having relatively high levels of exposure. The concentration of the latter in the Greater Accra region would partly explain their relatively high exposure to family planning messages. The ethno-linguistic groups that are concentrated in northern Ghana have relatively low levels of exposure to family planning messages. Both for religion and for ethnicity a pattern of groups with relatively high levels of exposure to family planning messages also tending to have relatively high use of modern contraception and relatively low fertility is evident. Although differences in contraceptive use by method type and in fertility by a woman's age are considerable, with women at the ends of the female reproductive age span tending to have the lowest levels of use of modern contraception, of natural contraception, and fertility, differences in exposure to family planning messages by age are fairly slight.

Multivariate Multinomial Analysis of Current Use of Contraception by Type of Method

The multilevel, multinomial logistic regression analysis shows that exposure to family planning messages via the radio raises significantly the likelihood of using a modern method of contraception (Table 6). Exposure to family planning messages by posters, brochures or leaflets substantially increases both the likelihood of a woman using modern contraception and the likelihood of a woman using a traditional method. However, after controlling for other variables, exposure to family planning messages via television or by newspapers have no significant effects on women's propensities to use particular types of contraception. That women who have seen posters, brochures or leaflets promoting family planning have increased rates of using modern methods and traditional methods in part reflects the exposure to family planning posters, brochures and leaflets of contraceptive users at sources of contraceptive supply, referred to earlier.

Having larger numbers of surviving children increases the likelihood of both types of contraceptive use significantly. The greater use of contraception among women with more surviving children reflects use for birth spacing, as well as, and possibly to a greater extent than, use for stopping. Indeed the concept of stopping childbearing is anathema to some (Nazzar et al. 1995). After the effects of other variables have been controlled for, the number of children a woman has had that are now dead has no effect on her subsequent likelihood of using either modern or traditional methods of contraception.

The effects of age on the odds of a woman using modern contraception have a "n" shape, with the peak childbearing ages between 20 and 29 having the highest values, and the low fertility 15 to 19 and 40 to 49 age groups the least. The odds of using traditional methods of contraception are highest between ages 20 and 34. The lower percentage of 15 to 19 year olds who are sexually active and the higher percentage of the 40 to 49 year olds who are infecund would explain the reduced contraceptive use in these age ranges.

Women who have had secondary level or higher education are much more likely to use modern contraception and much more likely to use traditional methods of contraception than are less educated women. Women with no formal education are the least likely to use contraception of either type. Some of the effect of secondary level or

higher education is due to sexually active women who are still students using contraception to prevent their education being disrupted by pregnancy or childbirth. However, even after education has been completed, secondary or higher education continues to raise contraceptive use because the more educated women (and their husbands) wish to restrict their number of children to ensure all are educated and provided for adequately. They also are better informed about and have fewer socio-cultural inhibitions relating to the use of modern contraception.

Living in an urban area raises the probability of use of modern contraception significantly. This would reflect urban women (and their husbands) having smaller family size preferences, shorter periods of postpartum sexual abstinence, fewer socio-cultural inhibitions about using contraception, and easier access to hospitals, clinics, pharmacies, drug stores and other contraceptive supply outlets (Tawiah 1997). The greater range of educational opportunities for their children is a factor behind their smaller preferred family sizes. The most striking feature of the effects of region of residence is the significantly reduced odds of using traditional methods of contraception for women who live in the Upper East region. The large and statistically significant cluster-level variance terms show there are considerable variations in both the odds of using modern contraception and the odds of using traditional contraception between places of residence that are not captured by the variables included in the model. The estimated covariance of the cluster effects on use of modern contraception and the cluster effects on use of traditional contraception is negative, suggesting that clusters with higher than predicted use of modern contraception tend to have lower than predicted use of traditional contraception. However, there is a high probability of the difference of this parameter from zero being due to sampling variability.

Primary adherence to Christianity or to Islam is associated with significantly higher odds of using modern contraception compared to those for women who adhere to some other religion, traditional beliefs or to no religion. The lower rates of use of modern contraception of adherents to traditional religious beliefs reflects the higher proportion of these women who are abstaining from sexual intercourse postpartum or for other reasons, and to a wider prevalence of socio-cultural inhibitions relating to contraceptive use (Caldwell and Caldwell 1990). After the other explanatory variables are controlled for, the differences in use of modern contraception and of traditional methods of contraception between ethno-linguistic groups are slight and not significant.

Multivariate Analysis of Current Fertility

The effects on fertility levels of exposure to family planning messages by radio, television, newspapers and magazines, and posters, brochures and leaflets all are small and not statistically significant, after the effects of other variables have been controlled for (Table 7). At first blush this finding may seem inconsistent with the substantial effects of exposure to family planning messages via the radio, television, and posters, brochures and leaflets on use of modern contraception described earlier. However, the findings are not necessarily anomalous, because contraceptive use measured at the time of the survey does not coincide with the conception window for fertility in the year before the survey [5]. The GDHS data show that for most of those women who are using contraception at the time of the survey the length of the duration of contraceptive use has been brief [6]. The correlation between use of contraception at the time of the survey and use of

contraception in the conception window would therefore be a relatively weak one. In a culture that emphasises the importance of birth spacing, a significant component of contraceptive use is for the purposes of achieving birth spacing (Nazzar et al. 1995; Phillips et al 2000). With a substantial component of contraceptive use replacing postpartum abstinence and some use coinciding with postpartum amenorrhoea, the effect of contraceptive use on subsequent fertility is reduced (Phillips et al 2000). That women who are not currently using of contraception have much lower levels of recent sexual activity than women who are currently using contraception, a pattern that would reflect the effects of postpartum sexual abstinence among the non-contraceptors, and also the greater prevalence among non contracepting women of not being married, spousal separation, sexual abstinence following stillbirth, miscarriage or abortion, sexual abstinence related to fear of AIDS, the rotation of sexual activity among polygynously married women, and the effects of infecundity, would also reduce the subsequent differences in fertility. That for some women a recent birth, and the subsequent need to ensure child spacing, may be seen as a cause of her use of contraception [7] is further reason for the weakness of the correlation between childbearing in the year before the survey and contraceptive use at the time of the survey. An underreporting of contraceptive use for the reasons described by Bawah et al (1999) may further weaken the correlation between recent fertility and reported contraceptive use.

The effects of age are marked and follow an “n” shape, rising to a peak in the 25 to 29 age range, and falling rapidly towards the ends of the female reproductive age span. The lower percentage of teenage women who are sexually active and the higher percentage of older women who are infecund, explain this pattern. Fertility rates tend to rise with the number of child deaths a woman has experienced. Health concerns may motivate some women who have had large numbers of children die from producing additional children. For some women a continuing pattern of short birth intervals may explain their having both large numbers of infant and child deaths and high birth probabilities. In addition, some of the effect of child mortality on fertility may be explained by the curtailment of the most recent periods of postpartum amenorrhoea and abstinence by the death of the most recent infant. Despite its importance as an explanatory variable for current use of modern contraception and traditional contraception, the number of surviving children a woman has does not appear to affect her subsequent fertility. The shorter periods of postpartum sexual abstinence practiced in some ethnic groups by women with more children may offset the effect of their higher rates of contraceptive use (Awusabo-Asare and Anarfi 1997).

Women with secondary level or higher education have significantly lower fertility than their less educated counterparts. The effect of having primary education, as opposed to no education, on fertility is negative, but not statistically significant. The substantial effects of female education, particularly to secondary level or above, in raising use of modern contraception and use of traditional contraception can partly explain this pattern. The effects of secondary and higher education in promoting smaller family size preferences, delaying first marriage, and increasing use of abortion are other explanatory factors (Lampthey et al. 1985).

Women who live in urban areas have much lower fertility than their rural counterparts, even after controlling for the other variables. The importance of urban residence as a factor raising use of modern contraception, described earlier, would

explain some of its fertility-reducing effect. A greater use of induced abortion in urban areas is probably another proximate determinant. The effects of region of residence are small and not statistically significant. The small and statistically insignificant cluster level variance parameter shows that virtually all the between-cluster variation in fertility levels can be accounted for by the explanatory variables used in the analysis.

The effects of differences in primary religious adherence are insignificant, after the effects of other variables are controlled for, a finding perhaps supporting the view of Adongo et al. (1998), that traditional religion is more a reflection of socioeconomic determinants than a factor that affects fertility independently. Similarly, the effect of ethnicity is small and not statistically significant.

Conclusions and Discussion

This study demonstrates that in Ghana exposure to family planning messages increases a woman's likelihood of using modern contraception. Whilst significant positive effects on the odds of using modern contraception of exposure to family planning messages via the radio and posters, brochures or leaflets are evident, the effects of exposure to messages via television and via newspapers or magazines are small and not significant. This could signal a need to review the effectiveness of television, newspaper and magazine family planning promotion, or for a revision of the promotional mix used for family planning. A revised promotional mix might devote fewer resources to television, newspaper and magazine advertising and more to publicity via radio and posters, brochures and leaflets.

Whilst exposure to family planning messages raises use of modern contraception significantly, it does little to explain differences in fertility levels between women. The lack of an effect of exposure to family planning messages on fertility may be explained by the prevalence of other fertility inhibiting practices among women who have not been exposed to family planning messages, particularly traditional birth spacing practices involving lengthy periods of breastfeeding, postpartum amenorrhoea and postpartum sexual abstinence (Phillips et al. 2000). Also relevant is that some exposure to family planning messages, especially exposure to posters, brochures and leaflets, occurs because of pregnancy and childbearing, for example due to exposure during antenatal and postnatal classes. Thus the multilevel logistic analysis captures the effect of exposure to family planning messages on fertility net of an effect of fertility on exposure to family planning messages. The study also finds substantial effects of a woman's age, education and urban or rural residence on her contraceptive use and her fertility. In addition, a Ghanaian woman's religion and number of surviving children are found to be important predictors of her likelihood of using modern contraception and traditional contraception, and her children's mortality is an important predictor of her fertility.

The 1998 GDHS data show that the duration of contraceptive use among women who are currently using contraception tends to be short. The effects of family planning promotion on contraceptive use would be affected by much of the use of contraception in Ghana being to provide a brief respite from pregnancy and childbearing, a pattern reflecting the importance placed on birth spacing. The collection of contraceptive history data and of analyses of patterns of discontinuation of contraceptive use would greatly enhance our understanding of the patterns of current use of contraception. Data on duration of contraceptive use in Ghana and other West African countries and analyses of

changes in the patterns may also greatly enhance our understanding of the emerging West African fertility transition. Another change to data collection that would sharpen our understanding of the effects of family planning promotion on contraceptive use and fertility would be to distinguish clearly between condom promotion designed primarily to prevent the spread of HIV/AIDS and other forms of family planning promotion. Other data that may help to enhance our understanding of the causes of Ghana's fertility transition would be on the economic adversity felt by many Ghanaians. A reason frequently given by Ghanaians for either not wanting more children or for aspiring to a small family size is the difficulty they may have in providing adequately for more children (Adongo et al. 1998). Underlying this sentiment are the combined pressures on finances posed by economic adversity, rising aspirations to provide for children, especially to educate them, and increased rates of child survival [8].

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Notes

1. Postpartum insusceptibility is the period of protection from pregnancy following a birth due to the combined effects of postpartum amenorrhoea and postpartum sexual abstinence.
2. The number of women who are "currently married" includes unmarried women who are cohabiting with their partner.
3. Analyses of Kenyan and Nigerian DHS data have found significant effects of exposure to family planning messages on contraceptive use and fertility preferences, even after controlling for a range of socio-economic variables (Westoff and Rodriguez 1995; Bankole et al. 1996).
4. For the purposes of this study modern methods are; the pill, IUD, injectables, diaphragm, foam, jelly, condom, female sterilization, male sterilization, norplant and lactational amenorrhoea. Traditional methods are; withdrawal, periodic abstinence and folk methods.
5. The conception window for childbearing in this period is roughly 9 to 21 months before the survey.
6. For 47.4% of the women who were using contraception at the time of the survey the duration of the current period of contraceptive use was 0 to 9 months and for 63.3% the duration was less than 21 months.
7. As noted earlier, recent fertility is also a cause of exposure to family planning messages during antenatal and postnatal classes.
8. Scholars who have speculated that economic hardship may contribute to the explanation of fertility decline in other African countries include Mbamaonyekwu (2000) for Nigeria and Hinde and Mturi (2000) for Tanzania.

Table 1: Total Fertility Rate and Selected Measures of Proximate Determinants of Fertility: 1988, 1993 and 1998 Ghana Demographic and Health Surveys

	1988	1993	1998
Total Fertility Rate	6.4	5.5	4.6
Percentage of Married Women Currently Using a Method of Contraception	13	20	22
Percentage of Married Women Currently Using a Modern Method	5	10	13
Percentage of All Women Currently Using a Method of Contraception	12	19	18
Percentage of All Women Currently Using a Modern Method ¹	5	9	11
Percentage of All Women Ever Used a Method of Contraception	34	43	45
Percentage of All Women Ever Used a Modern Method of Contraception	21	30	33
Percentage of Women Currently Married	70	70	65
Percentage of All Women Ever Married	81	81	76
Median Duration of Postpartum Insusceptibility (months) ⁺	16	16	14
Median Duration of Postpartum Amenorrhoea (months) ⁺	11	13	11
Median Duration of Postpartum Abstinence (months) ⁺	10	9	9

Sources: Ghana Statistical Service 1989, 1994, 1999.

+ Based on current status data.

Table 2: Distribution of Women by Ideal Family Size 1988, 1993 and 1998 Ghana Demographic and Health Surveys

Ideal Family Size	1988	1993	1998
Below 2	0	1	1
2	3	11	11
3	7	16	19
4	33	36	36
5	10	9	10
6+	35	21	17
Non-Numeric	13	7	7

Sources: Ghana Statistical Service 1989, 1994, 1999.

Table 3: Selected Indicators of the Socioeconomic, Demographic and Family Planning Promotional Background to Fertility: 1988, 1993 and 1998 Ghana Demographic and Health Surveys.

	1988	1993	1998
Percentage of Women who have heard a Family Planning Message over the Radio	NA	35	51
Percentage of Women who have seen a Family Planning Message on the Television	NA	22	34
Percentage of Women with Secondary or Higher Education	44	49	53
Percentage of Women Living in an Urban Area	34	38	36
Under 5 Mortality Rate (per 1000 live births)	155	119	108
Infant Mortality Rate (per 1000 live births)	77	66	57

Sources: Ghana Statistical Service 1989, 1994, 1999.

NA Not Available

Table 4: Percentage of Women Currently Using a Modern Method of Contraception, Percentage of Women Currently Using a Traditional Method of Contraception and Percentage of Women who Gave Birth in Last 12 Months by Exposure to Family Planning Messages by Type of Media and by Background Variables: 1998 Ghana Demographic and Health Survey

Characteristic	Percentage Using Method Type		Percentage Gave Birth in Last Year	n
	Modern	Traditional		
<u>Exposure to Family Planning Messages by Media</u>				
Radio	14.0	9.3	12.8	2334
Television	14.7	11.1	11.1	1504
Newspaper or Magazine	14.0	12.8	8.3	470
Poster, Brochure or Leaflet	13.6	10.4	13.7	1505
<u>Age</u>				
15-19	4.4	3.5	5.8	889
20-24	9.6	8.2	19.2	887
25-29	11.6	8.3	23.3	857
30-34	12.3	9.4	20.1	661
35-39	14.0	7.5	13.6	627
40-44	13.0	5.0	11.6	484
45-49	8.0	3.7	1.4	438
<u>Type of Place of Residence</u>				
Rural	8.7	5.1	17.2	3258
Urban	13.0	10.0	9.0	1585
<u>Region</u>				
Western	7.5	7.1	13.3	519
Central	9.6	5.1	14.3	447
Greater Accra	12.4	11.7	9.0	692
Volta	10.9	7.7	13.4	439
Eastern	14.9	6.4	13.1	550
Ashanti	10.8	8.3	15.7	629
Brong Ahafo	11.3	9.7	17.2	309
Northern	5.6	3.9	20.3	355
Upper West	8.0	3.4	20.0	350
Upper East	7.4	1.1	14.8	553
<u>Education</u>				
None	7.1	3.2	19.9	1737
Primary	10.1	5.8	16.4	813
Secondary or Higher	12.4	9.6	10.5	2293
<u>Religion</u>				
Christian	11.5	7.6	13.2	3499
Moslem	8.4	5.9	16.0	642
Traditional, Other or None	4.6	2.7	19.4	702
<u>Ethnicity</u>				
Akan	11.4	7.9	12.9	2240
Ga-Adangbe	13.1	10.5	11.3	344
Ewe	10.5	7.4	12.7	646
Guan	11.3	4.2	18.3	71
Mole-Dagbani	7.5	4.5	16.5	510
Other	7.3	3.5	19.0	1032

Source: 1998 Ghana Demographic and Health Survey Data.

Table 5: Exposure to Family Planning Messages by Type of Media and by Background Variables: 1998 Ghana Demographic and Health Survey

Characteristic	Radio	Television	Newspaper or Magazine	Poster, Brochure or Leaflet
<u>Age</u>				
15-19	40.8	29.0	11.6	26.2
20-24	48.6	33.3	10.2	35.3
25-29	54.6	34.2	10.5	32.5
30-34	50.5	33.7	14.2	33.4
35-39	49.4	30.3	9.9	30.5
40-44	49.8	32.3	13.2	31.0
45-49	44.8	26.5	13.0	27.8
<u>Type of Place of Residence</u>				
Rural	39.5	18.3	4.3	25.0
Urban	66.1	57.3	20.9	43.8
<u>Region</u>				
Western	46.1	25.8	6.8	23.5
Central	47.9	31.1	6.5	33.1
Greater Accra	71.2	68.6	28.6	41.6
Volta	33.0	10.3	6.6	15.5
Eastern	52.4	37.8	10.6	35.5
Ashanti	62.3	42.1	9.7	44.7
Brong Ahafo	50.2	30.8	3.2	59.7
Northern	35.2	17.0	4.5	16.7
Upper West	25.4	9.1	2.6	27.1
Upper East	35.3	10.9	4.7	12.3
<u>Education</u>				
None	31.6	12.1	6.4	16.7
Primary	46.7	29.4	4.0	30.2
Secondary or Higher	61.3	46.0	18.6	42.4
<u>Religion</u>				
Christian	53.7	36.5	12.3	36.5
Moslem	47.2	29.2	5.8	24.4
Traditional, Other or None	21.9	6.0	7.1	10.6
<u>Ethnicity</u>				
Akan	56.6	39.5	11.3	39.5
Ga-Adangbe	60.9	54.7	22.5	38.3
Ewe	46.0	26.9	10.4	24.2
Guan	32.4	23.9	8.5	39.4
Mole-Dagbani	42.6	18.8	3.7	18.9
Other	31.1	15.8	4.6	20.6

Source: 1998 Ghana Demographic and Health Survey Data.

Table 6: Multinomial Logistic Regression Model of Use of Contraception by Method Type: 1998 Ghana Demographic and Health Survey

Variable	Modern vs None		Traditional vs None	
	β	SE(β)	β	SE(β)
Constant	-4.00**	0.30	-4.18**	0.35
<u>Exposure to Family Planning Messages</u>				
Radio	0.58**	0.13	0.25	0.16
Television	0.14	0.13	0.32	0.17
Newspaper or Magazine	-0.11	0.17	-0.01	0.19
Poster, Brochure or Leaflet	0.24*	0.12	0.34*	0.14
<u>Age</u>				
15-19	0.00		0.00	
20-24	0.71**	0.21	0.88**	0.23
25-29	0.70**	0.21	0.84**	0.24
30-34	0.56*	0.23	0.89**	0.26
35-39	0.44	0.25	0.53	0.30
40-44	0.20	0.27	0.04	0.35
45-49	-0.43	0.31	-0.22	0.39
<u>Type of Place of Residence</u>				
Rural	0.00		0.00	
Urban	0.33**	0.12	0.31	0.17
<u>Region</u>				
Greater Accra	0.00		0.00	
Western	-0.23	0.25	-0.08	0.28
Central	-0.15	0.25	-0.49	0.31
Volta	0.50	0.28	0.40	0.33
Eastern	0.31	0.21	-0.39	0.27
Ashanti	-0.13	0.22	-0.26	0.26
Brong Ahafo	0.05	0.27	0.16	0.31
Northern	-0.29	0.32	-0.72	0.42
Upper West	0.17	0.34	-0.49	0.43
Upper East	0.19	0.32	-1.86**	0.31
<u>Education</u>				
None	0.00		0.00	
Primary	0.21	0.17	0.29	0.23
Secondary or Higher	0.53**	0.16	0.80**	0.20
<u>Religion</u>				
Christian	0.00		0.00	
Moslem	-0.06	0.20	-0.03	0.26
Traditional, Other or None	-0.70**	0.21	-0.27	0.28
<u>Ethnicity</u>				
Akan	0.00		0.00	
Ga/Adangbe	0.14	0.20	0.17	0.23
Ewe	-0.14	0.20	-0.17	0.24
Guan	0.12	0.42	-0.54	0.64
Mole-Dagbani	0.04	0.30	0.67	0.38
Other	-0.04	0.24	0.19	0.28
<u>No of Surviving Children</u>	0.24**	0.03	0.14**	0.04
<u>No. of Dead Children</u>	0.06	0.07	-0.12	0.11
<u>Cluster-level Variance</u>	0.36**	0.12	0.16*	0.08
<u>Covariance of Cluster-level Variances</u>			-0.07	0.07

Source: 1998 Ghana Demographic and Health Survey Data

** $p \leq 0.01$ * $0.01 < p \leq 0.05$

TABLE 7: Multilevel Logistic Regression of Whether a Woman Gave Birth in the Last Year: 1998 Ghana Demographic and Health Survey

	β	SE(β)
Constant	-2.53**	0.28
<u>Exposure to Family Planning Messages by Media</u>		
Radio	-0.08	0.11
Television	-0.03	0.13
Newspaper	-0.23	0.20
Poster, Leaflet or Brochure	0.06	0.11
<u>Age</u>		
15-19	0.00	
20-24	1.36**	0.18
25-29	1.65**	0.18
30-34	1.44**	0.21
35-39	0.93**	0.23
40-44	0.66*	0.27
45-49	-1.66**	0.48
<u>Number of Surviving Children</u>	-0.03	0.03
<u>Number of Dead Children</u>	0.15**	0.06
<u>Education</u>		
None	0.00	
Primary	-0.10	0.14
Secondary or Higher	-0.44**	0.13
<u>Type of Place of Residence</u>		
Rural	0.00	
Urban	-0.60**	0.13
<u>Region</u>		
Greater Accra	0.00	
Western	-0.08	0.24
Central	0.09	0.24
Volta	-0.11	0.26
Eastern	0.02	0.22
Ashanti	0.26	0.22
Brong Ahafo	0.26	0.26
Northern	0.07	0.27
Upper West	0.06	0.28
Upper East	-0.35	0.28
<u>Religion</u>		
Christian	0.00	
Muslim	-0.08	0.16
Traditional, Other or None	0.05	0.14
<u>Ethnicity</u>		
Akan	0.00	
Ga-Adangbe	0.10	0.22
Ewe	0.05	0.19
Guan	0.34	0.37
Mole- Dagbani	0.16	0.24
Other	0.27	0.19
Cluster Level Variance	0.06	0.05

Source: 1998 Ghana Demographic and Health Survey Data.

** $p \leq 0.01$ * $0.01 < p \leq 0.05$

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