Determinants of Fertility Decline in Malawi: An Analysis of the of Proximate Determinants

Abstract

The paper examines trends in the proximate determinants of fertility (nuptiality or marriage, contraception and post-partum infecundability) in Malawi during the twelve-year period (1992-2004) with the view of explaining the factors responsible for fertility decline in country. The study uses the Malawi Demographic and Health Surveys data sets of 1992, 2000 and 2004 and the Bongaarts model of proximate determinants. The goal is to identify the important intermediate variables that are amenable for policy towards fertility reduction. Analysis shows that there are increases in the absolute measures of all three determinants. The magnitude of change is greatest in contraceptive use, moderate in marriage but least in duration of breast-feeding. Like similar studies conducted elsewhere in Africa, the study show that postpartum infecundability has a far more dominant inhibiting effect on fertility than the other proximate fertility determinants. Specifically, the fertility suppressing effects of postpartum infecundability are more important than the effects of contraception, and marriage patterns in explaining fertility levels and trends in Malawi.

Keywords: nuptiality; post-partum infecundability; prevalence; contribution

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Introduction

The subject of demographic transition has been one of the principle preoccupations of during the last few decades. Some researchers have mentioned that the ever-present differentials in the levels, trends and determinants of fertility warrant separate and detailed studies in various regions and countries in order to obtain a better understanding of the issues (). In this paper an attempt is made to elaborate on the recent trend in fertility and its proximate determinants in Malawi. The need for the study of fertility in Malawi cannot be overemphasized. Fertility is one of the most important determinants of both population growth rate and on other social, economical and cultural parameters. This is especially true in Sub Saharan Africa (SSA) which until very recently has been characterized by a high population growth rate and high fertility. Fortunately, new evidence suggests that fertility levels have begun to decline in the region. However, the pace and intensity of such a change has by no means been uniform. Therefore this paper examines the nature and determinants of fertility decline in Malawi.

Country Background

Malawi's social and demographic indicators are among the worst in the world. The 2002 Human Development Report ranks Malawi 163 out of 171 countries. Relative to other countries in the region, Malawi has always had high fertility and mortality rates. For example, although the infant mortality rate has declined from 176s per 1000 in 1976 to 151 per 1000 in 1987 and to 135 per 1000 live births in 1998, Malawi has the highest infant mortality rate in the SADC region. Moreover, the risk of Malawian women dying due to pregnancy and related factors is very high and worsening. Maternal mortality ratio has increased from 620 per 100,000 live births to 1120 per 100000 live births. Similarly, expectation of life at birth of estimated to be 48 years in 1998 is believed to have decline to 40 years and is among the lowest in the world. The decline in expectation of life at birth is largely attributed to HID/AIDS epidemic. It is estimated that HIV/AIDS prevalence rate is 14%. Furthermore, studies have shown that the major factors contributing to the poor health status in the country are: poverty, high illiteracy rates, especially among women, too early, too many, too frequent and too late pregnancies and high fertility. Total Fertility Rate in Malawi is still high though it has declined somewhat over the past few decades. TFR has declined from 7.6 children per woman in 1977 to 7.4 children per woman in 1987 to 6.4 children per woman in 1998. The decline in fertility could be attributed to an

increase in contraceptive prevalence rate. Contraceptive prevalence rate has increased from 7 per cent in 1992 to 26% in 2000 (Malawi Government).

In order to address the above-described situation Government has placed poverty alleviation as its top developmental objective. With this is in mind government has prepared various policy documents including the national population policy whose overall objective is to achieve sustainable population growth rates which are compatible with the attainment of the country's social and economic development objectives.

Recent reports indicate that fertility is declining in Malawi (Cohen, 1993; Malawi Government, 1994a;UNFPA, 1997). Three things should be said about this claim. First, the suggestion that fertility has been declining in Malawi followed the publication of the 1992 Malawi Demographic and Health Survey (MDHS), which reported that the Total Fertility Rate (TFR) is 6.7 children per woman (Cohen, 1993; Malawi Government, 1994c). This was followed almost immediately by the publication of the 1987 Malawi Population and Housing Census, which estimated TFR to be 7.4 children per woman (Malawi Government, 1994a). The analytical Report of the 1987 Malawi Population and Housing Census further claims that

> "the total fertility rate has been increasing from 7.33 in 1972 to 7.6 in 1977. The total fertility rate declined from 7.6 to 7.5 in 1982 and it remained constant up to 1984. It is noted that the total fertility rate declined from 7.5 in 1984 Family Formation Survey to 7.4 as obtained by 1987 Population Housing Census. The present analysis shows that the trend for total fertility rate in Malawi is decreasing though very slowly" (Malawi Government, 1944a, 18).

The claim that fertility has increased and is now declining in Malawi contradicts an earlier official assertion by the National Statistical Office (NSO) which used to argue that fertility has remained constant (Malawi Government, 1984, 1987a, 1987b).

Second, a number of researchers and observers seem to have accepted the observed fertility decline at face value (UNFPA, 1997).

Third, in absence of any explanation, it is tempting to attribute the observed fertility decline to social and economic development which has, among other things, led to an increasing contraceptive use from less than one percent in 1984 to 7 percent in 1992 and 14 percent in 1996 (Malawi Government, 1987b, 1994c, 1997). Although Cohen (1993) questioned the nature and extent of fertility decline in Malawi, he attributed this to drought and increase of condom use as the following quotation indicates:

> However, 1990-92 were drought years, which may have affected behaviour over the short term. And the recent AIDS-prevention campaign may have achieved lower fertility through increased use of condoms, especially outside the sanctioned unions (Cohen, 1993, 50).

Furthermore, Chimbwete et, al (1998, 4) noted that the start of the decline in fertility almost certainly is as a result of an increase in the use of family planning method since there has been hardly any change in other fertility related variables such as age at marriage, age at first birth, breast feeding and post partum abstinence.

There is little information on the determinants of fertility in Malawi despite the fact that, for the past eight decades, the level of fertility has been said to be constant (Malawi Government, 1994b, Chimbwete et.al, 1998, Srivastava, 1991). Similarly, Existing data indicate wide socio economic, regional and district differences in fertility levels, which have not been rigorously studied (Malawi Government, 1984, 1994d; Palamuleni, 1992).

In view of the above background, this paper endeavours to study the factors that have been responsible for the recent fertility decline in Malawi. Specifically the paper aims at analysing the levels and trends in fertility Malawi, analysing the role of each of the proximate determinants in the fertility decline and decomposing the change in TFR between 1992 and 2000 and 2000 and 2004.

Data and Methods

The study is based on the analysis of secondary data obtained from the 1992, 2000 and 2004 Malawi Demographic and Health surveys (). All the surveys are nationally representative and have been implemented to allow analysis for Malawi as a whole and separately by rural-urban areas. The last two surveys allow the analysis to be conducted for selected districts. For the analysis, both the household and individual files have been used to obtain the necessary data.

To meet the objectives, Bongaarts (1982) model of "the Proximate Determinants of Fertility" has been applied. Bongaarts formulae for estimating TFR and the corresponding indices are easy to use and sensitive enough to determine the nature and pace of fertility change and its determinants. Also, the relative importance of each of these determinants in influencing fertility levels can be assessed from this model.

Bongaarts Model

Factors influencing fertility can be classified into two groups, namely intermediate fertility variables, or proximate determinants, and socioeconomic variables. The former, of interest because of its direct impact on fertility, consists of a set of biological and behavioral factors through which social, economic and cultural conditions can affect fertility. In other words, in the absence of these determinants, human fertility may reach a theoretical maximum of total fecundity (TF), accounting to an average of 15.3 births per woman. Thus, fertility differentials between regions and across time within the same region can always be traced to changes in one or more of the proximate determinants.

While Davis and Blake (1956) were the first to identify a set of 11 proximate determinants known as "Intermediate Fertility Variables", their classification did not get wide acceptance because it was not easily incorporated in fertility analysis. In view of that, Bongaarts (1978) reclassified this list of determinants into seven variables, including marriage pattern, contraceptive use, induced abortion, lactation infecundability, spontaneous abortion, frequency of coitus and sterility. However, after various studies, Bongaarts realized that some of these factors are more relevant than others in determining the magnitude of fertility change. In fact, only four of them (proportion married, contraceptive use and effectiveness, induced abortion and postpartum infecundability) are the most important in explaining fertility variation, accounting for up to 96% of fertility change in some populations (Bongaarts, 1982; 1978).

The fertility-inhibiting effects of the most important determinants are quantified in Bongaarts model by four indices, each of which assuming a value between 0 and 1. When the index is close to 1, the proximate determinant will have a negligible inhibiting effect on fertility, whereas when it takes a value of 0, it will have a large inhibiting effect. It is important to note that since abortion is unacceptable in Yemen because of religious considerations, the index of abortion has been taken as 1, and, therefore, its contribution to fertility decline is nil.

Bongaarts (1982) symbolized these 4 indices as follows:

Cm is the index of proportion married
Cc is the index of contraception
Ca is the index of induced abortion
Ci is the index of postpartum infecundability

The main equation of the model is:

$$TFR = Cm*Cc*Ca*Ci*TF$$

Where TFR is the Total Fertility Rate and TF is the Total Fecundity

Regarding the estimation of the 4 indices, Bongaarts proposed the following treatments:

Index of Marriage:

$C_m = \Sigma\{m(a)*g(a)\}/ \Sigma g(a)$

Where, m(a) is the age specific proportions currently married and g(a) is the age specific marital fertility rate. In other words,

$C_m = TFR/ TM$

Where TM is the Total marital fertility rate.

Index of Contraceptive Use:

$C_c = 1 - 1.08* u*e$

Where, u is the proportion currently using contraception among married women of reproductive age; e is the average use effectiveness of contraception and 1.08 is the sterility correction factor

Index of Postpartum Infecundability:

$C_i = 20/ 18.5 + i$

Where I is the average duration (in months) of postpartum infecundability caused by breastfeeding or postpartum abstinence.

Having obtained the indices, it is possible to calculate the various levels of fertility by means of multiplication with the corresponding indices. The model relating fertility to the intermediate variables takes the following form:

Total Fecundity (TF) = 15.3

Total Natural Marital Fertility (TN) = TF*Ci

Total Marital Fertility (TM) = TN* Cc*Ca

Total Fertility Rate (TFR) = TM* Cm

These are the four different types of fertility levels identified from which the impact of the proximate determinants can be obtained. With the inhibiting

effects of all proximate determinants present, a population's actual fertility level is measured by TFR. If the fertility-inhibiting effect of delayed marriage and marital disruption is removed without other changes in fertility behaviour, fertility will increase to a level of TM. If all practices of contraception and induced abortion are also eliminated, fertility will increase to a level of TN. Removing lactation and postpartum abstinence will, in turn, increase fertility to TF (Bongaarts, 1982).

Results and Discussion

Levels and Differentials in Fertility

Table 1 presents age-specific fertility rates and other fertility indicators calculated from the 1992, 2000 and 2004 MDHSs.

Table 1 Age Specific Fertility Rates and other measures of fertility for Malawi 1992, 2000 and 2004

				Percentage Decrease		
				1992-2000	2000-2004	1992-2004
Age Groups	1992	2000	2004			
15-19	0.161	0.172	0.162	6.4	-6.2	0.6
20-24	0.287	0.305	0.293	5.9	-4.1	2.1
25-29	0.269	0.272	0.254	1.1	-7.1	-5.6
30-34	0.254	0.219	0.222	-16.0	1.4	-12.6
35-39	0.197	0.167	0.163	-18.0	-2.5	-17.3
40-44	0.120	0.094	0.080	-27.7	-17.5	-33.3
45-49	0.058	0.041	0.035	-41.5	-17.1	-39.7
Total Fertility Rate	6.7	6.4	6.0	-6.0	-5.0	-10.2
Crude Birth Rate	42.9	45.5	42.4	6.1	-7.3	-1.2
General Fertility Rate	223.0	223.0	215.0	0.0	-3.7	-3.6
Mean age of childbearing	29.3	28.4	28.3	-3.2	-0.4	-3.4
Standardised Birth Rates*						
General Fertility Rate	204.1	196.9	187.7	-3.6	-4.6	-8.0
Crude Birth Rate (direct)	57.6	55.5	53.0	-3.6	-4.6	-8.0
Crude Birth Rate (Indirect)	64.4	62.6	60.1	-2.8	-3.9	-6.6

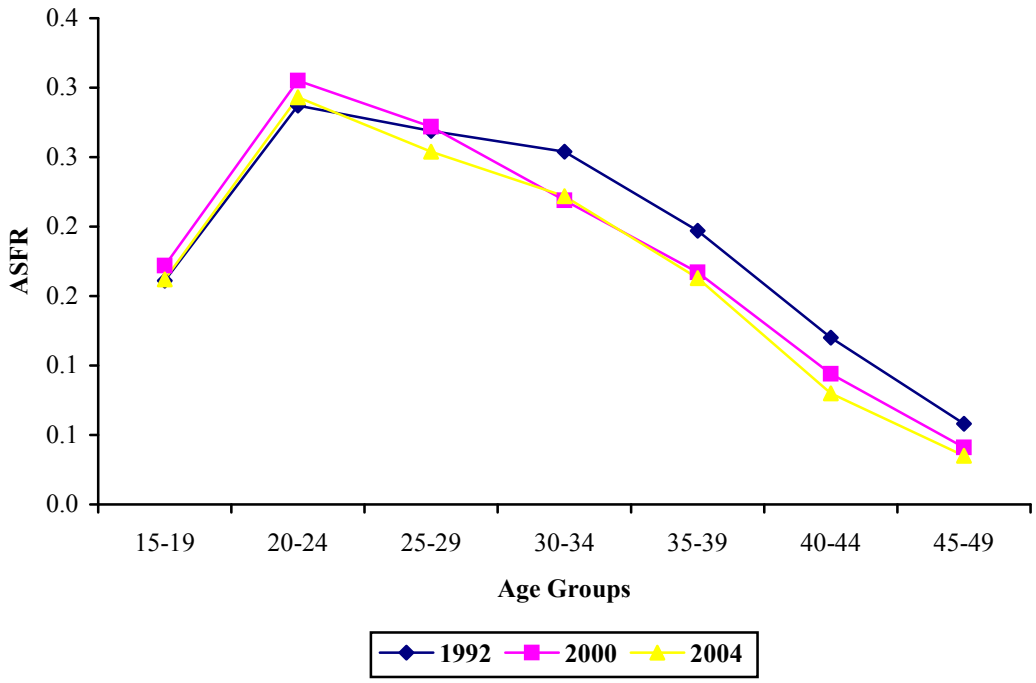
* The 2001 South African Population was used as a standard

The crude birth rate in Malawi increased from 42.9 in 1992 to 45.5 in 2000 and then declined to 42.5 births per 1,000 mid-year population in 2004. The analytical report of the 1998 Malawi Population and Housing census suggest

that CBR in Malawi is around 55 per 1000 (Malawi Government, 1994b, 2002). Overall the crude birth rate for Malawi based on demographic and health surveys are lower than those based on the analysis of census data. The general fertility rate (GFR), a measure of the number of children per 1,000 women aged 15-49, remained constant between 1992 and 2000 at 223 before declining to 215 per 1,000 women in 2004. As for the total fertility rate (TFR), Table 1 show that it has gone down from 6.7 in 1992 to 6.4 in 2000 and to 6.0 in 2004.

The age-specific fertility rates (ASFRs) start from a low value in age group 15-19 rising to a maximum in age group 20-24 before declining to lowest value in age group 45-49. This pattern is observed in all data sets. Table x also suggest that the decrease in fertility in Malawi is primarily due to declines in the older age groups (say age groups above 30 years). ASFR at younger age groups (age groups below 30 years) appears to have risen. The shift in the timing of fertility is also indicated by the decline in the mean age of childbearing (m) from 29.3 years in 1992 to 28.4 in 2000 and 28.3 in 2004. On the one hand this observation is consistent with the finding by other researchers who noted that fertility patterns tend to concentrate and shit to younger years as fertility decline (Stover and Kirmeyer, 1999). On the other hand this contradicts the assertion by Caldwell et. Al (1992) that " … the African fertility transition … will be characterised by fertility decline at all ages …". Probably this claim is true at advanced stages of fertility transition and not at early stages as it is the case of Malawi.

Figure 1 Age Specific Fertility Rates for Malawi, 1992-2004



Fertility change can also be traced by examining cohort parity progression ratios (PPRs). The PPR is defined for parity I as the proportion of women who proceed to the next birth, I+1, among those who have had an ith birth. PPRs show the proportion of women who proceed from one event in the childbearing sequence to the next (Feeny, 1991). Older women (40-49) are chosen so that their PPR will be closer to their final PPR. Table 2 presents PPRs for Malawi for the three data sets under review. Cohort Fertility Rate has declined from 7.3 in 1992 to 6.9 in 2000 and to 6.8 in 2004.

Overall, other things being equal, the fertility measures utilised in this section have shown that during the fourteen-year period under consideration, fertility in Malawi has been declining.

Table 2 PPR for Malawi 1992, 2000 and 2004

	1992	2000	2004
0	0.998	0.995	0.996
1	0.987	0.987	0.984
2	0.984	0.974	0.976
3	0.970	0.966	0.959

4	0.944	0.923	0.935
5	0.919	0.874	0.854
6	0.879	0.843	0.838
7	0.837	0.745	0.758
8	0.673	0.658	0.649
Cohort Fertility Rate	7.3	6.9	6.8

Figure 1 PPR for Malawi, 1992, 2000 and 2004

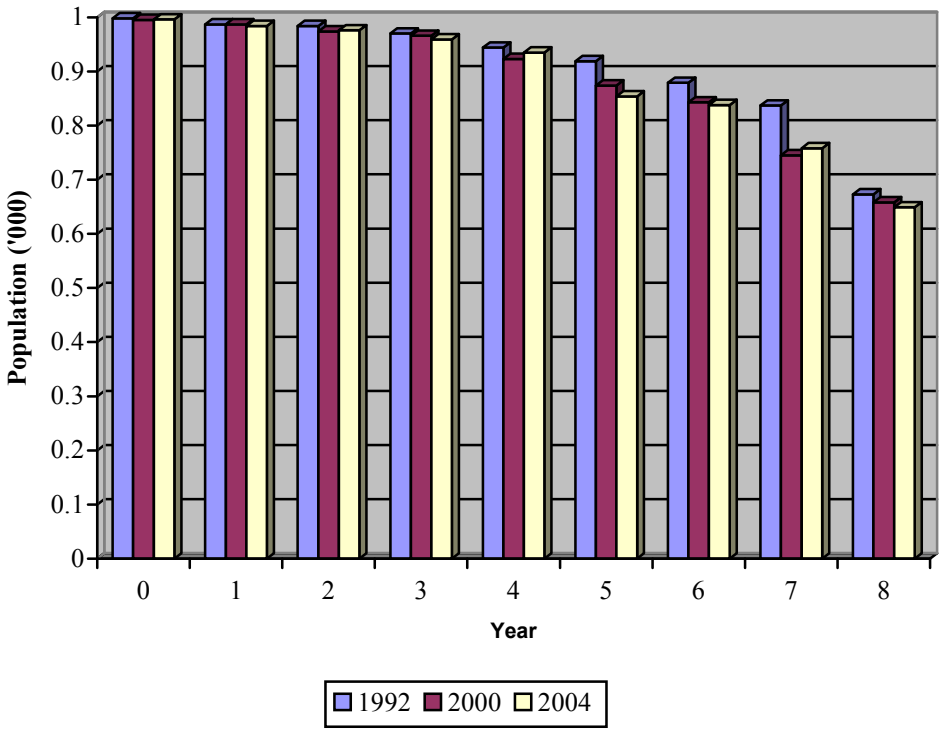
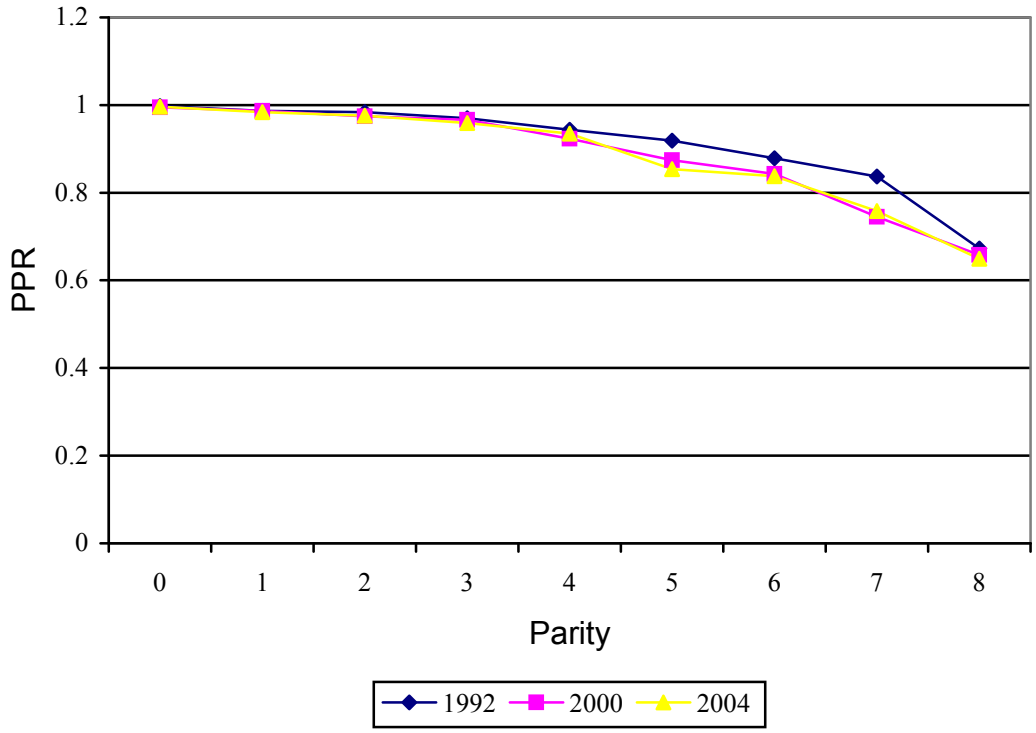


Figure 2 PPR for Malawi, 1992, 2000 and 2004



Proximate Determinants of Fertility

To improve the understanding of the causes of fertility decline in Malawi it is necessary to analyse the mechanisms through which socio-economic variables influence fertility. Davis and Blake(1956) referred to these mechanisms as the "intermediate fertility variables". Later, Bongaarts developed a model which quantifies the impact of the intermediate variables (Boongaarts, 1978; Bongaarts and Potter, 1983). Furthermore Bongaarts (1978) has proposed that the principal proximate determinants are marriage, breastfeeding, contraceptive use and abortion. The myriad of social, economic and cultural factors that influence fertility act through one or more of the proximate determinants.

Age at First Marriage and Proportion Married

Age at first marriage refers to the ages reported by the respondents as those at which they began their first marital relationships. Age at first marriage identifies the onset of exposure to continuous and socially sanctioned childbearing. Implicitly therefore, the earlier a woman marries, the longer her

reproductive life span, the higher the number of children she is expected to have at the end of her childbearing period, *ceteris paribus*. Conversely an increase in the average age at first marriage in a population is associated with the transition to lower fertility, as the length of time the woman spends exposed to the risk of childbearing is reduced and consequently the number of children she will bear over her reproductive span declines.

In Malawi information on age at first marriage was collected by askingeach ever married woman for the date (month and year) when she began living with her first husband. Respondents were also asked how old they were when hey first married.

The results indicate that that the mean age at first marriage has increased from 17.7 in 1992 to 17.9 in 2000 and 18.1 in 2004. The findings seem to suggest that the mean age at first marriage is increasing in Malawi. In 2000 the mean age at first marriage vary from 18.2 years in 15-19 to 17.9 years in 45-49. The same pattern is observed in 2004 MDHS. Overall the values of mean age at first marriage suggest an increase in age at first marriage.

The increase in the age at first marriage could also be inferred from the decline in the proportion married in age 15-19. Table x indicate that 41% (two fifths) of the women aged 15-19 reported that they were ever married in 1992. This proportion declined to 37% in 2000 and 36% in 2004. However, although the mean age at first marriage appears to be increasing in Malawi the results show that the increase is small and many women still marry at an early age and marriage is universal. More than eight-tenth of the women are married before their twenty-fifth birthday and nearly 98% of the women are married by age group 25-29 and almost all the women are married by age group 30-34.

Another way of looking at age at first marriage is to examine the singulate mean age at marriage (SMAM). The SMAM is the mean age at first marriage among those who ever marry (United Nations, 1983). Available information indicate that SMAM has increased from about 17 years in 1977 and 1987 to 19 years in 1998 census (Malawi Government, 1984, 1994a,2002).

Although the available statistics in Malawi point to rising trend in age at first marriage, the increase is still so small as to lead to drastic changes in fertility.

Table 3 Mean age at first marriage and proportion ever married by age, 1992-2004

Age	Ever Married			Mean age at first marriage		
Groups	1992	2000	2004	1992	2000	2004

15-19	41.2	36.8	36.3			
20-24	90.0	87.7	88.0	17.7	18.2	18.1
25-29	97.8	98.2	96.6	17.2	18.1	18.2
30-34	99.4	99.1	99.1	17.9	17.7	17.8
35-39	98.9	99.7	99.3	18.1	17.7	17.7
40-44	99.4	99.6	99.6	18.4	17.5	17.7
45-49	100.0	100.0	99.6	17.7	17.9	18.1
				17.7	17.9	18.0

Contraception

Contraception has a direct negative impact on fertility. The use of contraceptive methods has significantly risen in Malawi over the twelve-year period. Table x indicates that contraceptive prevalence rate rose from 13% in 1992 to 25% in 2000 and 26% in 2004. These statistics suggest that that contraceptive use increased by 70% during the period 1992-2000 and then remained constant thereafter. This is an interesting finding and should be seen in light of the prevailing social, economic and political context. Available literature on family planning in Malawi has tended to focus on the initial resistance that was there during the first postcolonial government (1964-1994) that was headed by Dr. Hastings Kamuzu Banda who opposed the introduction of family planning.

It appears that the family planning programme efforts at both governmental and nongovernmental levels introduced during the dying stages of Banda regime produced the required dividend during the period 1992-2000. However, following the Programme of Action that was adopted in Cairo in 1994 that put emphasis on reproductive health the implementation of family planning programme appear to have slacken. The Family Planning Unit in the Ministry of Health was changed to Reproductive Health Unit and more resources were being targeted to RH activities.

In 1999 the National Family Planning Council of Malawi was closed down on the advice of World Bank. The levelling off of contraceptive use between 2000 and 2004 could therefore be attributed to reduced family planning programme efforts of post Banda regimes. It remains to be seen whether the apparent sluggish change in contraceptive use as a result of reduced commitment on the part of the Government will be given the attention among researchers and policy makers.

It should be noted, however, that rate is more concentrated at older ages, suggesting that the younger women are more interested in procreation than using contraception either for spacing or stopping of births.

Table 4 also indicates the declining importance of the traditional methods. CPR by traditional methods has declined from 6% in 1992 to 3.4 in 2000 and

3.3 in 2004. This could be related to the national family planning programme and the related campaigns that promotes use of modern contraceptives.

Table 4 Contraceptive Use by age by method: Malawi 1992, 2000 and 2004

	1992			2000			2004		
	Any	Modern	Traditional	Any	Modern	Traditional	Any	Modern	Traditional
15-19	7.3	3.4	3.9	7.9	6.9	1.0	8.5	7.6	0.8
20-24	12.0	5.3	6.6	24.5	21.5	3.0	25.6	22.5	3.1
25-29	14.8	8.4	6.4	32.9	28.5	4.5	32.0	27.8	4.1
30-34	16.2	8.2	8.0	32.9	28.1	4.7	32.1	28.6	3.5
35-39	16.4	11.3	5.2	34.0	29.6	4.4	32.8	28.6	4.1
40-44	13.2	9.3	3.9	33.4	28.5	4.9	35.0	29.7	5.2
45-49	6.4	4.6	1.8	21.9	17.3	4.6	28.2	22.9	5.3
	13.0	7.4	5.6	25.0	21.5	3.4	25.7	22.4	3.3

Breastfeeding, Postpartum Amenorrhoea, Abstinence, and Infecundability

Lactation (breastfeeding) and postpartum practices (amenorrhoea and abstinence) are associated with fertility. Postpartum amenorrhoea refers to the temporary disappearance of menstruation after childbirth at which period a woman becomes non-susceptible to conception. Various studies have established a direct relationship between the length and intensity of breastfeeding and the duration of postpartum amenorrhoea (Bongaarts and Potter, 1983; Gutmann and Fliess, 1993; Mbamaonyeukwu, 2000). Postpartum abstinence refers to the period of voluntary sexual inactivity following childbirth. Thus, women are considered infecundable if they are not exposed to the risk of conception either because they are amenorrhoeic or are abstaining from sexual intercourse after childbirth. Stemming from its defining characteristic, postpartum infecundability is one of the four proximate factors through which economic, social and other factors operate to influence fertility.

Table 5 shows the mean duration (in months) of breastfeeding, postpartum amenorrhoea, abstinence and infecundability for 1992, 2000 and 2004. The table reveals that Malawiann women breastfeed their infants for about two years. This is quite encouraging, especially when viewed against the background of the nutritional benefits of breast milk.

The table shows that this scenario has not changed much over the years. The results indicate that the older women consistently breastfeed for longer periods than the younger ones.

The finding seems to suggest that fertility decline in Malawi is partly attributed to the sluggish changes in breastfeeding behaviour.

Breastfeeding is universal in Malawi with 98% of children born in the last five years having been breastfeed.

Furthermore, Table 5 shows that the mean duration of postpartum amenorrhoea among Malawian women has declined from 14 months in 1992 to 12 months in both 2000 and 2004. This shows that other things being equal, in absence of contraception, Malawian women are likely to become pregnant sooner rather than later

A similar picture emerges when postpartum abstinence and postpartum infecundability (PPI) are considered.

In fact, while PPI was 16 months in 1992, it declined to about 15 months in 2000 and 13 months in 2000. The mean duration of postpartum abstinence among Malawian women has declined from 9 months in 1992 to about 6 months in both 2000 and 2004.

Table 5 Mean duration of Breeastfeeding, Amenorrhea, abstince and insusceptibility for Malawi, 1992, 2000 and 2004

	Breastfeeding	Amenorrhoea	Abstinence	Insusceptibility
1992	20.6	14.1	9.0	16.1
2000	23.8	12.7	5.8	14.5
2004	23.1	11.5	5.5	12.9

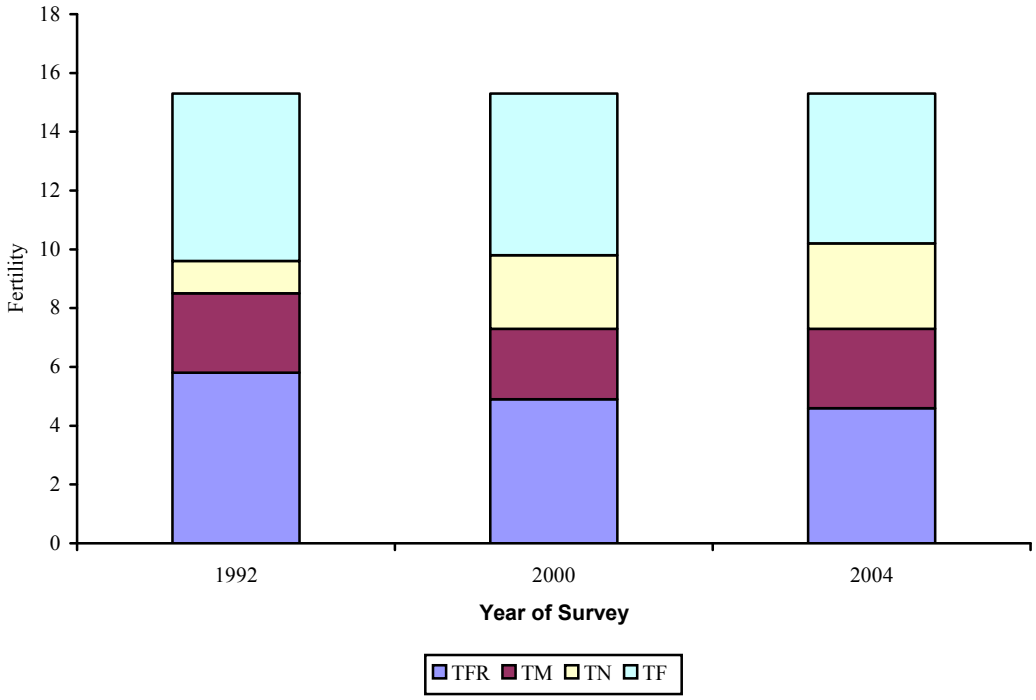
The role of the four proximate determinants on the fertility decline in Malawi

The indices of marriage, contraceptive use, induced abortion, and postpartum infecundability and the TFR and TF as obtained from using Bongaarts model for the years 1992, 2000 and 2004 are presented in Table 6 below. In analysing these findings, it should be kept in mind that the lower the value of an index, the higher the percentage reduction in the TFR due to that index.

Table 6 Estimates of Selected Fertility Measures, Proximate Determinants and Indexes of Proximate Determinants for Yemen 1992 and 1997

	1992	2000	2004
Total Fertility Rate (TFR)	6.7	6.4	6.0
Total Marital Fertility Rate (TMFR)			
Proportion currently using contraception (u)	0.13	0.25	0.26
Contraceptive use-effectiveness (e)	0.11	0.23	0.24
Total Abortion Rate (TA)			
Duration of breastfeeding	20.0	23.8	23.1
I	13.5	12.7	16.2
Duration of postpartum infecundability			
Proportion childless at age 45-49/40-44 among currently married women		2.0/1.6	
Cm	0.69	0.67	0.63
Cc	0.89	0.75	0.72
Ci	0.63	0.57	0.58
Estimated TF	17.6	22.6	22.9
Implied TFR	5.8	4.3	4.0
TMFR	9.8	9.6	9.5
TNFR	11.0	12.8	13.2
TF	17.6	22.6	22.9

Figure 3 Proximate Determinants of Fertility in Malawi 1992, 2000 and 2004



In calculating the index of marriage, ever-married women were considered instead of currently married women, because when currently married were used to calculate Cm, the implied TFRs were very low.

It should be noted that the implied TFR in all cases is lower than the observed TFR. This may be due to the fact that the model of 15.3 is lower than that found in Malawi.

As it can be seen from table 6, TFR has declined by by 0.7 births from 6.7 in 1992 to 6.0 in 2000 and it declined by a further 0.4 births from 6.4 to 6.0 between 2000 and 2004.

In all the three surveys the most important index in explaining the level of fertility in Malawi is the index of postpartum infecundability. This is followed by the indices of marriage and contraception. Postpartum infecundability has had a large effect in reducing fertility at both times, but it has not exhibited as much of a decrease between the two periods as Cc.

As for the index of contraceptive use (Cc), it appears that this factor has changed during the period under review. Cc has decreased from 0.89 in 1992 to 0.75 in 2000 and to 0.72 in 2004. This decline in the index of

contraception (Cc) may be an important factor in explaining the drop in fertility witnessed in Malawi especially during the period 1992-2000. The percentage currently using contraception has increased from 7.7% in 1992 to 25% in 2000 to 26% in 2004. It may be noted as well that contraceptive use effectiveness has improved during the period under review, increasing from 11% in 1992 to 23% in 2000 and to 24% in 2004.

Conversely, between the years 1992 and 2000, the index of marriage has declined from 0.69 to 0.67. Thus, postponement of marriage as a factor in fertility decline is of less significance in explaining the decline in TFR in the year 1997 than either postpartum infecundability or contraceptive use.

Decomposition of the role of the four major determinants on fertility decline between 1992 and 2004

Table 7 indicate the magnitude of the total inhibiting effect being accounted for each proximate determinant at different time points starting from 1992 to 2004. The difference between the total fecundity and the estimated TFR demonstrates the resultant inhibitory effect of each determinant. The total inhibiting effect is prorated by the propotion of the logarithm of each index to the sum of logarithm of all indices. The results indicate that out of the 11.3 births in 2004 that were inhibited, 3.90 births (or 34.6%) are due to the effect of marriage, 2.8 births (or 24.6%) are due to contraception and 4.6 births (or 40.8%) are due to postpartum infecundability. Similarly, in 2000, the three proximate determinants (marriage, contraception and postpartum infecundability) inhibited 10.92 births, and these are distributed as 3.5 births (32%), 2.51births (23%) and 4.91 births (45%), respectively.

The analyses in the preceding paragraph indicate that the impact of breastfeeding on fertility is on the decline as a result of reduced intensity of breastfeeding. The decline in breastfeeding is likely to increase in future as the status of women improves. The impact of conception is increasing over time.

Table 7 Decomposition of the Change in the Proximate Determinants in Malawi between 1992 and 2004

	Births per woman			Percentage		
	1992	2000	2004	1992	2000	2004
Marriage	3.67	3.50	3.90	39.1	32.0	34.6
Contraception	1.15	2.51	2.77	12.3	23.0	24.6
Infecundability	4.56	4.91	4.60	48.7	45.0	40.8
	9.38	10.92	11.27	100.0	100.0	100.0

HIV/AIDS and Proximate Determinants of Fertility

Though the focus of this study is not on HIV/AIDS and proximate determinants of fertility it is crucial to acknowledge the effect of HIV/AIDS on the proximate determinants of fertility. This is the case given that Malawi is one of the countries that are hardest hit by the HIV/AIDS epidemic. The adult prevalence rate was estimated to be 14 percent in 1999. HIV/AIDS has been observed to affect fertility and its proximate determinants in a number of ways (Guy, 1999;). First, there can be a change in attitude and behaviour in people such that they decide to refrain from premarital sex and multiple sexual partners and postpone marriage indefinitely. The slight increase in age at first marriage in Malawi could be attributed to this phenomenon. Second, in contrast to most infectious diseases, which take their heaviest toll among the elderly and the very young, this virus takes its greatest toll among young adults such that many women die before completing their reproductive years (ibid). Third, contraceptive use might increase due to the recommendations put forward for the usage of the condom because of its HIV preventive qualities. Fourth, infected mothers might decide to terminate their pregnancies in order to avoid infecting their babies (ibid). All these four mentioned changes have a suppressing effect on fertility. Fifth, mothers in fear of transmitting the virus to their babies might decide not to breastfeed and take short periods of postpartum abstinence so that their partners do not engage in extramarital affairs, thus attracting early pregnancies and as a result enhance fertility (Ntozi, 2002). Lastly, women infected by HIV might have lower fertility because of secondary sterility and fetal loss brought by the disease and its associated infections (Theunissen, 2002). The last two factors increase fertility levels.

It can be speculated that HIV/AIDS will reduce Malawi's fertility given the death toll it has on the reproductive population, the increase in contraceptive use as well as the possibility that people will change their social behaviour and attitude to avoid HIV/AIDS. In other words, fertility suppressing factors will offset fertility-enhancing factors thus reducing fertility in the long run. However, to draw robust conclusions it is necessary to investigate further the impact of HIV/AIDS on fertility in Malawi.

Conclusion and Recommendations

The estimated indices for the years 1992, 2000 and 2004 have yielded an implied total fecundity rate of 16.89 and 16.83, respectively. In other words, on average a Malawian woman, whose marriage remained intact throughout her reproductive age span, used no contraception and no induced abortion

and did not breastfeed, has the potential to produce 16.83 children in 1992, 22.3 children in 2000 and 22.4 children in 2004.

However, the four proximate determinants of fertility have played an important role in reducing fertility from potential level (TF) to actual level (TFR).

As we have seen from this study, during the period 1992-2000, the strongest reduction in fertility has been caused by the factor of contraceptive utilization. This is a reflection of commitment the Malawi government paid in increasing both the availability and utilization of contraception. The importance of contraceptive use however appears to be surpassed by the changing patterns of marriage during the period 2000-2004.

The results of this analysis have important implications for policy development and programme planning in Malawi. The observed stagnation in contraceptive use should be a source of concern to anyone interested in the family planning programme in Malawi. If family planning programme is expected to play a leading role in reducing the rate of population growth in the country, as advocated in the national population policy, then the current family planning programme efforts at both governmental and nongovernmental levels should be vigorously pursued so as to raise contraceptive prevalence rate and hence further reduce fertility.

Rising levels of mean age at first marriage for women is clearly an evidence of rising levels of educational opportunities. The current emphasis on the education of the girl child should be intensified so as to further reduce marriage at an early age. Moreover, sufficient female education acts as a catalyst in changing pronatalist tendencies, empowers the woman, and prepares her for gainful employment outside the home, all of which have a negative influence on fertility.

Overall, the findings of this study show that the fertility-inhibiting effects of postpartum infecundability are more important than the effects of contraception and marriage patterns. Consequently, the promotion of prolonged breast-feeding durations should continue to receive the attention of the government and other stake holders because long durations of lactation inhibit fertility. Moreover, the nutritional benefits of breast milk to children are well documented.

In conclusion, as it has been seen throughout this paper, there is a need to manipulate the proximate determinants of fertility in order to have further and faster fertility drop in Malawi. While not much can be done to increase the contribution of induced abortion to fertility decline because of religious and cultural prescriptions that forbid this practice; however, governmental policies can concentrate on effectively and efficiently increasing contraceptive

utilization and effectiveness, on encouraging breastfeeding and on rising the age of marriage.

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