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in Ethiopia and Eritrea:  
Trends and prospects for the future**

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## Reproductive intentions and fertility in Ethiopia and Eritrea: Trends and prospects for the future

Gebremariam Woldemicael<sup>1</sup>

**Abstract:** A characteristic of sub-Saharan African pre-transitional fertility regimes is a strong desire for large family size. This has often been attributed to deeply-seated immutable social organization and to high gender-stratified cultures which encourage high fertility through the separate roles they assign to men and women. However, this claim is no longer valid in many contemporary African countries where fertility has begun to decline. In this study, fertility is examined in relation to trends in reproductive preferences using two waves of Demographic and Health Survey data from Ethiopia and Eritrea. The central question is to examine whether stated desires to terminate childbearing are related to trends in overall marital fertility and to explore prospects for the future. The results suggest that although the level and trends of fertility intentions vary by country, some clear patterns exist that have implications for policy making. First, the fraction of unwanted childbearing is high and tends to rise as overall fertility declines; this is particularly noticeable in Ethiopia. This suggests that the country has begun the fertility transition and there is a prospect for further downward trend in fertility. A comparison of unwanted with overall fertility in Eritrea does not give the same relationship. Although Eritrea has begun the fertility transition and has a total fertility of about 5 children per woman, which is similar to that of Ethiopia, its unwanted fertility is still low and show no sign of change over time. Furthermore, contraceptive use increased substantially in Ethiopia as the proportion of women who want no more children increased. The implication is that there are high levels of unmet need for childbearing limitation in Ethiopia while there is no clear indication of that kind in Eritrea.

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## **Introduction**

Until the late 1980s, an average woman in sub-Saharan Africa had six children in her lifetime, which was higher than the average for any other region in the world. Nevertheless, during the 1990s, fertility started to decline in many sub-Saharan countries, this marks the beginning of a trend to smaller family size preferences and increased contraceptive use in the region (USAID 2003). Thus, there are indications that fertility has started to fall in many sub-Saharan African countries, of which Ethiopia and Eritrea are among them. A rise in contraception and changes in other proximate variables are mentioned as reasons for the ongoing fertility decline (USAID 2003; Bongaarts 1997). Unfortunately, despite increases in contraceptive use, many African couples still do not achieve their fertility goals, and as a consequence, the number of undesired reproductive events is substantial (Adetunji 2001; Westoff 1981). Unwanted births account for about 25% of total births in developing countries (Bongaarts 1994). The level of unwanted fertility tends to be particularly high in countries that are in the middle stages of the transition to lower fertility. As a society develops, desired family size declines, resulting in a corresponding rise in the proportion of women who want to stop childbearing (Bongaarts 1997). In such societies, unless effective birth control is practiced, women can have several unwanted pregnancies during their childbearing ages. In more developed societies, couples may have better knowledge of contraception and better access to contraceptive services and hence lower levels of unwanted pregnancies (Kulkarni and Choe 1998).

Conventional demographic transition theory predicts that a decline in actual fertility should lag behind decline in desire for more children or in ideal family size. Several classical demonstrations of fertility transition show that, as a country develops, the cost of rearing children rises and benefits from having them fall, thus leading couples to want smaller families (e.g., Bulatao 2001). To implement these preferences, couples use contraception, which in turn leads to lower actual fertility. However, evidence on fertility decline has not always been consistent. It is argued that fertility decline may occur without any evident reduction in desired family size as fertility and fertility desires can be influenced by other non-conventional factors such as war or economic and political crises (Agadjanian and Ndola 2002). Ethiopia and Eritrea have experienced political unrest, economic volatility, and repeated wars in the past years, of which the border conflict of 1998-2000 is one. Evidence from the most recent Demographic and Health Surveys (DHS) of Ethiopia and Eritrea shows that fertility was high until the late 1990s, when a precipitous decline began in both countries. The average number of children per woman, as measured by the Total Fertility Rate (TFR), has since then declined by about one child in both countries. Although use of contraception has moderately increased in Ethiopia, it remained unchanged in Eritrea since the mid-1990s. The recent declines in fertility highlight the importance of examining the trends of both reproductive intentions and actual fertility and finding evidence of the trend in both indicators so that policies for addressing high fertility are based on sound evidence. Although fertility preferences reported in a cross-sectional survey cannot offer an exact blueprint for future trends in fertility, some studies have shown that fertility preferences are valid predictors of future fertility change (e.g., Bankole and Westoff 1998; De Silva 1991; Westoff 1990).

Measuring the extent of unwanted fertility also improves our understanding of the process of transition from high to low levels of fertility (Bulatao 2001). Measuring the degree to which women are having births that are unwanted provides justification for the efforts undertaken by national governments and international agencies to promote access to contraceptive methods (Westoff 1981; Lighbourne 1985; Bongaarts 1990).

In view of the above policy implications and lack of empirical explanations for the recent decline in fertility in Ethiopia and Eritrea as well as the uncertainty whether reproductive preferences have changed over time, a comprehensive analysis is essential. This study tries to fill this gap in knowledge by first examining recent trends in fertility in both countries. Next, we assess the changes in unwanted childbearing in relation to overall marital fertility in an attempt to understand the prospects of future fertility trends in Eritrea and Ethiopia. Finally, we explore if there has been a change in contraceptive use among women who want to avoid childbearing and how much unmet need there is for avoiding childbirth.

## **Background to Ethiopia and Eritrea**

The contexts to be investigated are the countries of Ethiopia and Eritrea, two of the least developed countries in the world with per capita incomes of about US\$120. Maternal and child mortality are still high; about 700 maternal deaths per 100,000 live births and more than 60 infant deaths per 1000 live births. More than 76% of Ethiopian and 60% of Eritrean households have no access to safe drinking water (CSA and ORC Macro Inc. 2006; NSEO and ORC Macro Inc. 2003). About 39% of males and 52% of females in Eritrea have never attended school. The corresponding figures for Ethiopia are 52% and 67%. The male-female gap in education is more evident at higher than at lower levels of education.

The two countries are still characterized by high fertility levels, although these have started to decline. Of course, the trends have not been uniform. Variation is found between the two countries and among groups within each country in the timing and speed of decline. For example, at national level, the decline has been faster in Eritrea than in Ethiopia. Within each country, large differentials in fertility by rural-urban residence exist in Ethiopia, where the capital city, Addis Ababa has achieved below replacement fertility (of two children per woman), while rural areas have fertility in excess of about five children per woman. In Eritrea, there are rural-urban differentials as well, where urban fertility is lower than rural fertility by more than one child, but the difference is not as large as in Ethiopia.

Added to this, the two countries have been in a state of war with each other during the past three or more decades. The thirty-year war (1961-91) for Eritrean independence and the 1998-2000 border conflict after independence had significant economic and social impacts on both countries. The border conflict had a great impact on the socio-economic and demographic situation, particularly in Eritrea where the population is only a fraction of that of Ethiopia. In Eritrea, the conflict resulted in a decline in GDP growth from 8%

annually during 1993-97 to 3% in 1999 while inflation rose from 6% to 27% between 1998 and 2000 (UN 2000). In Ethiopia, inflation was at 15% in 2002-03, although it declined to 7% in 2004-05. The impact of the war is also reflected in high proportions of female headed households and increased spousal separation, factors that are important for fertility change.

Understanding changes in fertility preferences is critical for these two countries. We expect that in countries like Eritrea and Ethiopia, with frequent swings between periods of war and peace, people are accustomed to uncertainty and take it into account when stating their preferences for future fertility. We could expect that the uncertainty of peace and military tensions may depress the desire for fertility and as a result fertility may decline. One could also expect the opposite, however, as high fertility societies like Eritrea and Ethiopia may demonstrate strong pronatalist pushes during periods of recovery from military conflict when the desire for large family size may increase. In fact, both of these fertility responses of war have been suggested in previous studies. That is, fertility falls because the stress and uncertainties of people's lives are not conducive to childbearing and it rises because of pressures to replace deceased children (Lindstrom and Berhanu 1999; McGinn 2000). Thus, although the data used in this study do not allow any examination of the duration of war-induced change in fertility behaviors, the war is likely to have had some impacts on reproductive behavior. In addition, cultural values or traditions of a society may affect fertility behavior when traditions favor large family size and less traditional people prefer smaller families.

## **Data and method**

The data for this study come from four Demographic and Health Surveys (DHS) conducted in 1995 and 2002 in Eritrea and in 2000 and 2005 in Ethiopia. In the analysis of wanted and unwanted fertility, data for women who had given birth in the five years preceding each survey were used: Data on wanted and unwanted fertility were obtained only from women who had given birth in the five years preceding the survey date. The wording of the question was: "At the time you became pregnant with (NAME), did you want to become pregnant then, did you want to wait until later, or did you want no more children at all?" Women's responses provided the basis for classifying pregnancies as wanted when they occurred, wanted later (mistimed), or not wanted.

To get insights into how the level of unwanted marital fertility or fertility preferences changes in the course of fertility transition, two approaches are adopted. First, we estimate the Total Marital Fertility Rate (TMFR), the Wanted Total Marital Fertility Rate (WTMFR), and the Unwanted Total Marital Fertility Rate (UTMFR) to examine whether UTMFR differs according to the overall TMFR in each country. The WTMFR is calculated in a similar way as the TMFR except that it excludes unwanted births from the numerator. The difference between the TMFR and WTMFR is the UTMFR, which is a measure of excess fertility. Second, we examine how the proportion of women wanting no more children has changed over time (from one survey to another) to see if the desire for limiting births varies over the course of fertility decline in these countries. The

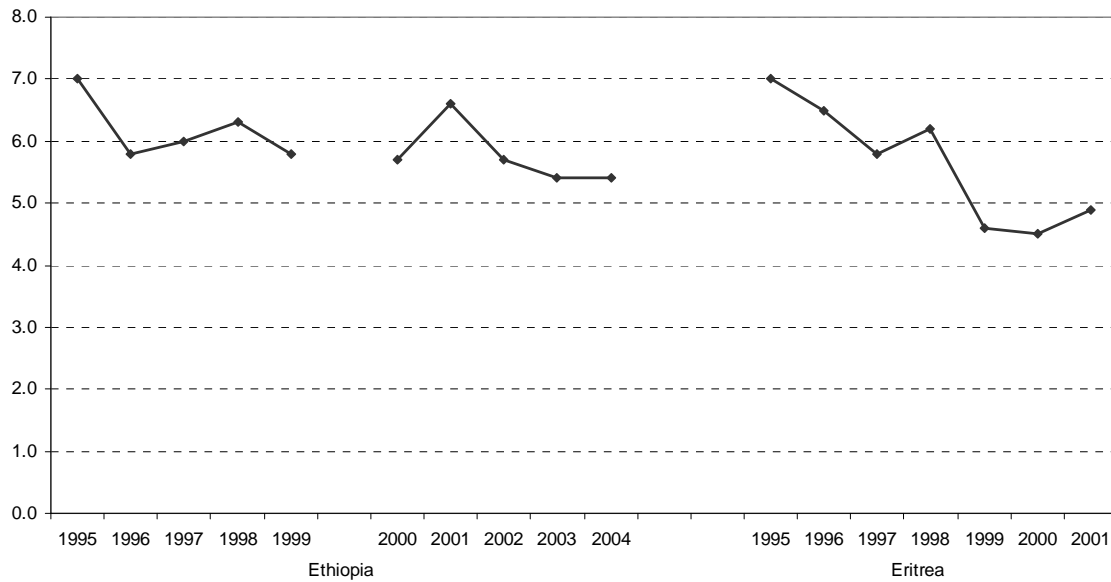
prevalence of contraceptive use among women who want no more children is also assessed to get an idea about the unmet need for limiting childbirth.

Bivariate methods are used to analyze the levels and trends of fertility and fertility intentions. To examine the determinants of unwanted fertility, a logistic regression model is used; logistic regression is appropriate when outcomes are dichotomous and no observations are censored.

### Trends in fertility in Ethiopia and Eritrea

To have some ideas of fertility trends in Ethiopia and Eritrea, total fertility and age specific fertility rates at national and rural-urban levels are presented in Figures 1 through 6. Ethiopia and Eritrea are at their earliest stage of fertility transition and have intermediate levels of fertility (a TFR of about 5). Total fertility (TFR) was around seven children per woman during the mid-1990s (see Figure 1). Since then, it has declined, with a relatively faster decline in Eritrea, particularly after 1998. TFR declined from about 6.1 children per woman in 1997/98 to 4.8 in 2001/02 in Eritrea and from 6.0 children per woman in 1997/98 to 5.3 in 2004/05 in Ethiopia. In about seven years, the TFR thus declined by about 0.7 child per woman (or 12%) in Ethiopia, while in Eritrea, it declined by about 1.3 children (or 21%) in the four years between 1997/98 and 2001/02.

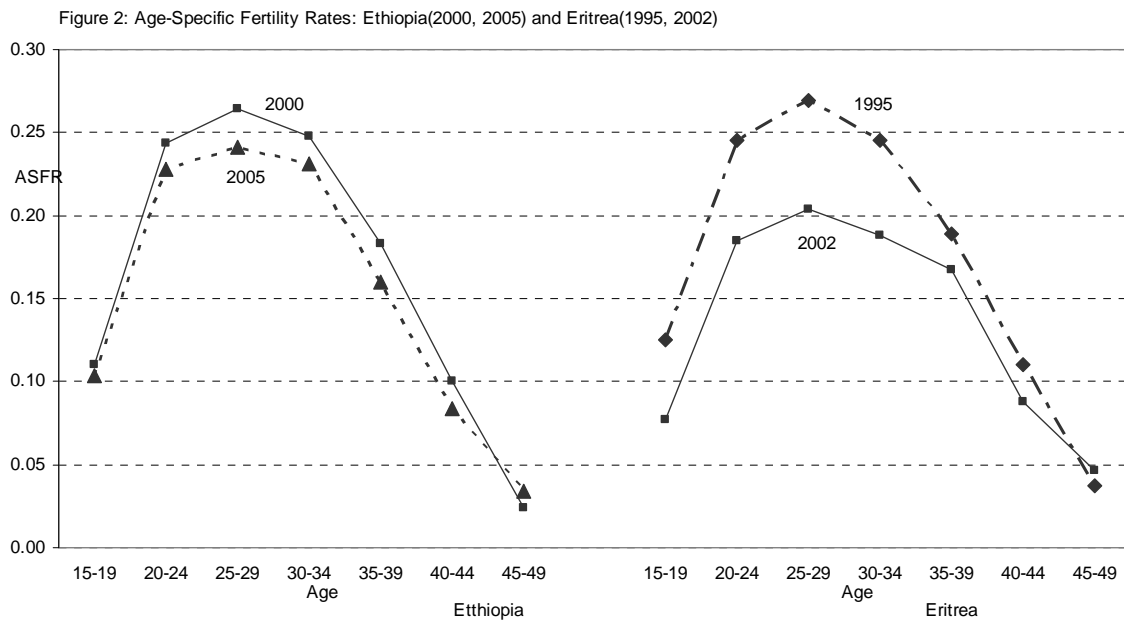
Figure 1: Estimated TFR, Ethiopia (1995-2004) and Eritrea (1995-2001)



According to published DHS reports, in Eritrea, the decline occurred in both urban and rural areas, while in Ethiopia the decline was mostly an urban phenomenon. In the latter country, the TFR declined by 27% (from 3.3 to 2.4) in urban areas, but only by 6% (from 6.4 to 6.0) in rural areas between 2000 and 2005 (CSA and ORC Macro Inc. 2006). In

Eritrea, on the other hand, the corresponding figures are 17% (from 4.2 to 3.5) and 19% (7.0 to 5.7) in urban and rural areas, respectively, between 1995 and 2002 (NSEO and ORC Macro Inc. 2003).

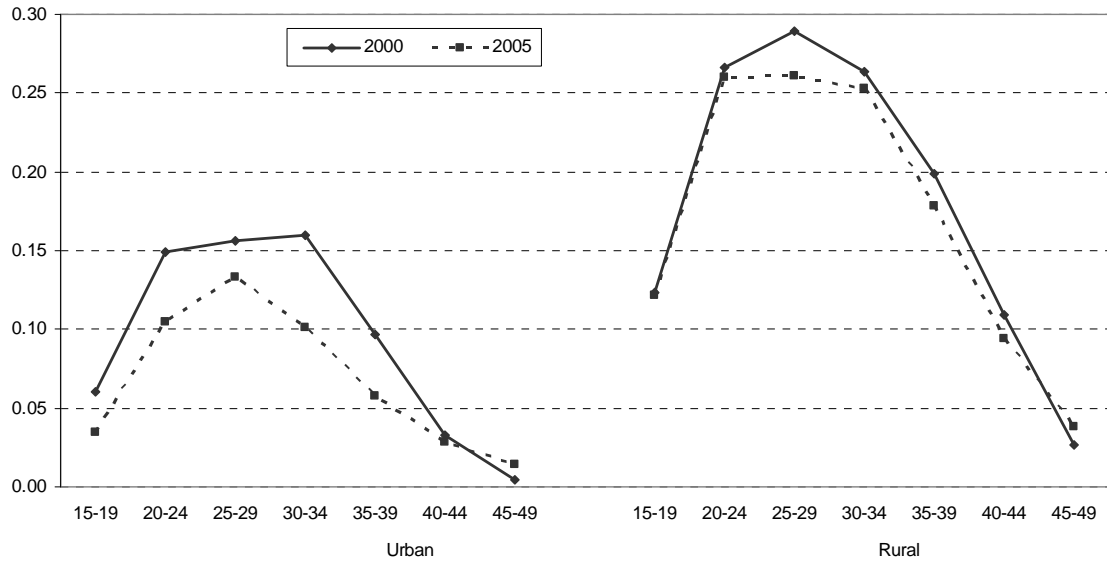
Figures 2 through 4 provide further insights into the fertility decline by age of women. The Age-Specific Fertility Rates (ASFRs) in Figure 2 show that the populations of both countries are characterized by a broad age pattern of fertility with reduced fertility only at the advanced ages. This is a characteristic of populations where there is little parity specific fertility control. In Eritrea, a decline in fertility over calendar period is visible at all ages bar the oldest one, although most of the fertility decline occurred among women aged 20-30 years. In Ethiopia, the decline occurred at all ages as well, though the decline is much smaller and more evenly distributed across ages than in Eritrea. At the youngest ages, the decline is very weak.



Source: CSA and ORC Macro(2001, 2006) Ethiopia Demographic and Health Survey 2000 & 2005; NSO and ORC Macro(1997, 2003) Eritrea Demographic & Health Survey 1995 & 2002. Calverton, Maryland

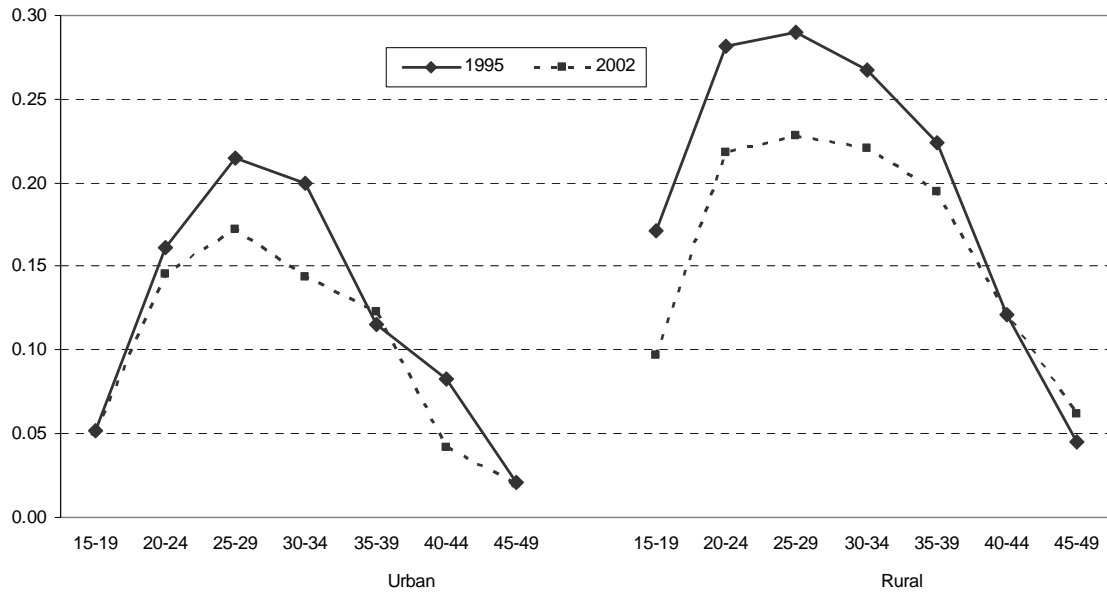
Figures 3 and 4 show that the decline by age in rural areas where the majority of the populations live follows the national trend in both countries, but, in urban areas, levels and patterns differ from those at the national level. At all age groups, fertility is lower in urban than in rural areas, but the urban-rural gap is wider in Ethiopia than in Eritrea, particularly at the mid-reproductive ages (i.e., 20-34). A widening difference between urban and rural fertility patterns is evident in Ethiopia as its rural fertility has stalled at a TFR of about 6 children per woman. Changing attitudes towards low desire for children is likely to be more evident in urban areas where children are more expensive to rear (Teller et al. 2007).

Figure 3: Change in Fertility Pattern by urban-rural residence, Ethiopia (2000, 2005)



Source: CSA & ORC Macro (2001, 2006) Ethiopian Demographic & Health Survey 2000 & 2005. Calverton, Maryland

Figure 4: Change in Fertility pattern by urban-rural residence, Eritrea (1995, 2002)



Source: NSO & ORC Macro (1997, 2003) Eritrea Demographic and Health Survey 1995 & 2002. Calverton, Maryland



## **Wanted and unwanted marital fertility developments**

In this section, we examine if fertility desires have changed during the course of fertility decline in Ethiopia and Eritrea and if this trend predicts future fertility decline. Past studies (e.g., Kulkarni and Choe 1998) indicate that unwanted fertility is very low or does not exist at the two extreme stages of transition: at the beginning when fertility desires are mostly unrestricted and at the end of the transition when couples have nearly complete control over their fertility. In between these two extreme stages, many couples prefer a specific family size but do not control their fertility effectively and hence have some unwanted births (Easterlin 1983; Bongaarts 1997). According to Bongaarts (1997), unwanted fertility is zero when no women want to stop childbearing; it peaks in the middle of the fertility transition when about half of women who want no more children use effective contraception and again drops to zero when all women who want no more births use effective contraception. Another study by Adetunji (2001) reveals that the risk of unwanted fertility is low in countries with TFR above 6 and below 3 and high in countries with a TFR in-between these values. In our case, as fertility level begins to decline in Ethiopia and Eritrea, we should expect to see an increase in the level of unwanted fertility, as a reflection of a downward trend in fertility preferences.

The key questions here are: Do the findings from Ethiopia and Eritrea show the expected trend? That is, does the level of unwanted fertility depend on where these countries are in the course of fertility transition? And what do the findings suggest in relation to the prospects for future fertility decline? It is evident from the later DHS surveys of the two countries (see Table 1) that levels of total marital fertility are high, at about six children per married woman, and the proportions of unwanted fertility are 22% and 7% of total marital fertility in Ethiopia and Eritrea, respectively. Looking at these figures, it seems that Ethiopia is in the middle stage of the transition to lower fertility, while Eritrea is at the beginning of the transition. But, their current level of fertility is almost the same. Such difference in unwanted fertility may be attributed to other factors, such as the differential impact of the recent border conflict between the two countries.

From these results, we can infer that if unwanted births had not occurred, the total marital fertility rates would have been 22% and 7% lower than they were in recent years (i.e., 4.7 births per woman rather than 6.0 in Ethiopia and 5.3 births per woman rather than 5.7 in Eritrea). Thus, had women in Ethiopia used contraception to avoid their unwanted births, the reduction in overall fertility would have been much larger than in Eritrea. The increase over calendar periods in unwanted marital fertility in Ethiopia suggests that Ethiopia indeed is moving from a high to a low fertility regime. As countries move from high to low fertility levels, unwanted fertility first tend to increase unless efforts are made to reduce it and then decrease as fertility reaches its lower stage (Adetunji 2001). On the other hand, the stall or decline in unwanted fertility in Eritrea does not relate very well to the overall trend in fertility.

Table 1 also presents differentials in the levels of wanted and unwanted fertility by urban-rural residence and education of women. Fertility preferences appear to vary among women according to their residence and education. In Eritrea, wanted marital fertility is

about one and half child higher among rural than among urban women in both surveys while there is no urban-rural difference in unwanted fertility. In Ethiopia, wanted marital fertility is almost twice as high in rural than in urban areas in both surveys. The urban-rural difference in unwanted fertility is not consistent, however. While it is higher in urban than in rural areas in the first Ethiopian survey the pattern is reversed in the later survey. This may indicate that urban couples who in the earlier period were not using contraceptives were more likely to do so in the more recent period. In terms of educational differentials, there are large and consistent differences in wanted fertility among the three education groups, with illiterate women wanting more children than women with a primary or higher education. The pattern for unwanted fertility is more complicated. In Ethiopia, unwanted fertility is higher among women with primary or no education in the later survey, and among women with secondary or higher education in the earlier survey. Again, it may be that many women with primary or no education in the later period would like to have fewer children but are not yet controlling their fertility effectively. In contrast, women with secondary or above education might have improved their contraceptive use in the later period. In Eritrea, unwanted fertility is the same among all education groups, just like it was for urban-rural areas. Regardless of socio-economic status, few women seem to wish to lower their fertility.

Table 1: Trends in the total marital fertility, wanted and unwanted marital fertility, and percentage of total marital fertility that is unwanted, according to residence and education, Ethiopia (2000, 2005) and Eritrea (1995, 2002)

<b>Eritrea</b>	1995				2002			
	TMF	WTMF	UTMF	% unwanted*	TMF	WTMF	UTMF	% unwanted*
Residence								
Urban	5.3	4.5	0.8	15	4.7	4.3	0.4	9
Rural	7.0	6.2	0.8	11	6.2	5.7	0.5	8
Education								
No education	6.8	6.1	0.7	10	6.0	5.6	0.4	7
Primary	5.5	4.8	0.7	13	4.7	4.3	0.4	9
Secondary+	4.8	4.1	0.7	15	4.2	3.9	0.3	7
<b>Total</b>	<b>6.5</b>	<b>5.7</b>	<b>0.8</b>	<b>12</b>	<b>5.7</b>	<b>5.2</b>	<b>0.4</b>	<b>7</b>
<b>Ethiopia</b>	2000				2005			
	TMF	WTMF	UTMF	% unwanted	TMF	WTMF	UTMF	% unwanted
Residence								
Urban	4.3	3.0	1.3	30	3.5	2.8	0.7	20
Rural	6.6	6.0	0.6	9	6.8	5.4	1.4	21
Education								
No education	6.6	5.8	0.8	12	6.6	5.4	1.2	18
Primary	5.8	5.1	0.7	12	5.9	4.4	1.5	25
Secondary+	4.2	2.9	1.3	31	3.4	2.7	0.7	21
<b>Total</b>	<b>6.4</b>	<b>5.5</b>	<b>0.9</b>	<b>14</b>	<b>6.0</b>	<b>5.0</b>	<b>1.3</b>	<b>22</b>

\* calculated as  $UTMF/TMF \times 100$

## **Do women want more or no more children?**

To get further information on whether the stated unwanted childbearing is related to the course of overall fertility decline in Ethiopia and Eritrea, we examine in more depth what are the proportions of women who want no more children. Previous studies (see e.g., Westoff and Bankole 2002) indicate that the proportion of women who want no more children in sub-Saharan African countries that have experienced sustained fertility decline is within the range of 30 to 50%. In Table 2, the proportions of currently married women who want and not want more children are shown for groups of women with different number of living children. The desire for another child is strongly related to the number of living children a woman has. As the number of living children increases, the proportion of women who desire to have an additional child declines while the proportion of women who want no more children increases in both countries. Table 2 also indicates that unwanted childbearing for Eritrean women with six or more children remained virtually constant at about 45% between the two surveys, while that for Ethiopia has slightly increased over the five years covered by the surveys (to 65%).

The proportions of women who want no more children in Eritrea remained almost constant at about 17-19% between the two surveys. This is a low level as compared to the range in sub-Saharan Africa reported by Westoff and Bankple (2002) and suggests that the country is only at the beginning of a fertility transition. In contrast, the proportion of women who wanted to cease childbearing in Ethiopia is higher and has increased from 31% to 38% between the two surveys. These figures are within the range of African countries that experience sustained fertility decline. These figures also support the study by Adetunji (2001) who found high levels of unwanted fertility in countries that have begun the transition and have intermediate levels of fertility. From these results one may get the impression that Eritrea is possibly at the beginning of fertility transition while Ethiopia is in the middle of its transition. However, the fact that both countries have rather similar fertility levels does not support this conclusion. Another observation is that the proportion of women who cannot decide on their fertility desire is much higher in Eritrea than in Ethiopia. This may be a reflection of the recent border war which affected Eritrea more severely than Ethiopia. The conditions of warfare and the atmosphere of uncertainty they generate may discourage Eritrean couples from having children or at least make them not to be sure about the number of children they want to have. War-induced social distress, deterioration of health, and economic decline are crucial in shaping reproductive behavior and outcome (Agadjanian and Ndola 2002).

Table 2: Trends in percentage of currently married women who want additional and no more children, according to number of living children, Ethiopia(2000, 2005) and Eritrea(1995, 2002)

<b>Eritrea</b>								
No. of living children	1995				2002			
	% wanting another child	% wanting no more	% undecided	% infecund	% wanting another child	% wanting no more	% undecided	% infecund
0	91.9	2.0	4.6	1.6	93.3	0.5	5.5	0.8
1	91.5	3.9	3.1	1.5	90.8	2.3	5.9	0.9
2	87.6	7.2	3.5	1.7	86.1	4.6	7.2	2.1
3	84.3	9.8	3.4	2.6	80.3	9.8	7.2	2.6
4	74.7	17.4	3.0	5.0	68.0	18.8	9.9	3.3
5	64.2	22.6	5.0	8.2	57.7	23.2	13.2	5.9
6+	40.0	44.4	7.0	8.5	37.1	45.1	12.8	5.1
<b>Total</b>	<b>72.3</b>	<b>18.7</b>	<b>4.5</b>	<b>4.5</b>	<b>72.8</b>	<b>16.6</b>	<b>8.7</b>	<b>2.9</b>
<b>Ethiopia</b>								
No. of living children	2000				2005			
	% wanting another child	% wanting no more	% undecided	% infecund	% wanting another child	% wanting no more	% undecided	% infecund
0	88.3	5.5	1.5	4.6	85.7	8.6	0.9	4.7
1	85.5	11.7	1.7	1.0	82.7	15.8	0.7	0.8
2	74.0	21.3	2.9	1.8	69.3	28.2	1.3	1.2
3	65.8	28.4	2.8	3.1	62.5	34.0	1.7	1.8
4	56.6	37.4	2.3	3.7	46.6	49.9	1.1	2.4
5	46.8	44.1	3.4	5.6	39.7	54.3	2.1	3.9
6+	31.3	59.0	3.4	6.3	29.2	65.4	1.4	3.9
<b>Total</b>	<b>63.3</b>	<b>30.5</b>	<b>2.6</b>	<b>3.6</b>	<b>58.0</b>	<b>38.2</b>	<b>1.3</b>	<b>2.5</b>

### What explains the variation in levels of unwanted childbearing?

Although the above analyses of fertility preferences give some insights into unwanted childbearing by the number of living children a woman has, further analysis is made in this section using multivariate regression models in order to understand the factors that may explain unwanted childbearing. The results are presented in Table 3. They show that urban residence is associated with significantly higher odds of a desire to limit fertility in both countries. The results also show that women with primary or more education have an increased likelihood of wanting no more children. Table 3 also demonstrates that the number of living children a woman has and her marital duration significantly affect the desire for more children: women with a large family and at longer marital durations are more likely to wanting no more children than those with a small family and at shorter durations. The results also reveal that the use of contraception is significantly related to the wish to cease childbearing. Contraceptive users in all surveys except that of 1995 in Eritrea are estimated to have been about twice as likely as non-users to want to limit childbearing. The associations of factors with the desire for limiting childbearing are largely consistent across surveys in both countries.

Table 3: Odds ratio of the effects of selected socio-demographic factors on the desire to terminate childbearing, Ethiopia (2000, 2005) and Eritrea (1995, 2002)

Variables	Eritrea		Ethiopia	
	1995	2002	2000	2005
<b>Residence</b>				
Urban	1	1	1	1
Rural	0.49***	0.53***	0.57***	0.76***
<b>Education</b>				
No education	1	1	1	1
Primary	2.48**	1.25*	1.69***	1.45***
Secondary+	2.05*	2.20***	1.71***	1.17*
<b>Number of living children</b>				
0-1	1	1	1	1
2-3	2.06	4.29**	2.70***	2.87***
4-5	8.65***	13.67***	4.67***	5.99***
6+	9.38***	34.39***	7.70***	7.79***
<b>Duration of marriage</b>				
0-4	1	1	1	1
5-9	1.80	1.06	1.13	0.93
10-14	2.77	0.80	1.48***	0.97
15-19	5.23**	1.57*	1.93***	1.47***
20-24	9.38***	2.54***	3.00***	2.03***
25+	25.0***	3.77***	4.33***	3.47***
<b>Use of contraception</b>				
Non-user	1	1	1	1
User	0.74	1.94***	1.98***	2.08***

### Unmet need for family planning

This section provides estimates of the need for contraception in order to limit family size. Estimates are provided for currently married women with different educational characteristics and rural-urban residence. We assess whether the need is met by contraceptive use and if there are any changes in behavior over time.

In an ideal situation, all women who want no more children and are exposed to risk of conception would use some kind of contraception. In practice, however, some women fail to use contraception and are at risk of having unwanted births. One way of measuring the unmet need for fertility limitation is to calculate the proportion of currently married women who want no more children but are not practicing contraception (e.g., Westoff 1981; Westoff and Ochoa 1991). Table 4 presents these results by urban-rural residence and education of women. The first column of this table shows the proportion of currently married women who want no more children; the second column shows the proportion of women who want no more children and are using contraception; the last column shows the estimated proportion of women who are at risk of having unwanted births, namely those who do not want any more children and are not using contraception.

Table 4 shows that there are differences in contraceptive use among married women who want no more children in the two countries. First, the fraction of women who want no more children is much higher in Ethiopia than in Eritrea and it has increased from the first survey to the latter. In Eritrea, we observe no changes over calendar time. Second,

the use of contraceptives of women who want no more children (as fraction of the total married population) is higher in Ethiopia than in Eritrea and it has increased over time, too. In Eritrea, the proportion of women who want to limit family size and are using modern contraception is very low. In Ethiopia, the relatively large fraction of married women who want no more childbearing is translated into higher contraceptive prevalence as well. However, the unmet need for contraception is higher in Ethiopia than in Eritrea, too. The proportion of women who wished to avoid pregnancy but are not using contraceptives is about twice as high in Ethiopia than in Eritrea. This clearly indicates that there is still a high demand for family planning in Ethiopia.

Women with higher educational level are more likely to be knowledgeable about contraceptive methods and to adopt birth control (Bongaarts 1997). As expected, implementation of preferences is positively related with women's level of education in both countries. The tendency of using contraceptives among women not wanting more children is much higher among those with some education than among those with no education. In terms of urban-rural differentials, the results show that urban women are more likely to use contraception than their rural counterparts in both countries. One possible explanation is that the majority of rural and uneducated women are weakly motivated to limit fertility or have limited access to family planning services. This is also true in many other African countries.

Table 4: Percent married women who want no more children, and contraceptive use among such women, by rural-urban residence and education, Eritrea (1995, 2002) and Ethiopia (2000, 2005)

Variables	Percent who want no more children		Percent who want no more children and are using contraception		Percent at risk of having unwanted births	
	1995	2002	1995	2002	1995	2002
<b>Eritrea</b>						
<b>Residence</b>						
Urban	31.1	22.4	15.2	11.6	15.9	10.8
Rural	8.8	15.0	0.9	2.5	7.9	12.5
<b>Education</b>						
No education	17.4	18.4	2.2	3.7	15.2	14.7
Primary	21.3	16.0	11.8	8.8	9.5	7.2
Secondary+	19.4	18.1	12.2	9.3	7.2	8.8
<b>Total</b>	<b>18.1</b>	<b>17.6</b>	<b>4.8</b>	<b>5.9</b>	<b>13.3</b>	<b>11.7</b>
	2000	2005	2000	2005	2000	2005
<b>Ethiopia</b>						
<b>Residence</b>						
Urban	40.3	47.8	25.0	34.4	15.4	13.4
Rural	30.9	41.4	7.1	12.5	23.8	28.9
<b>Education</b>						
No education	32.0	43.0	5.5	12.6	26.5	30.4
Primary	29.8	39.5	10.5	20.7	19.3	18.8
Secondary+	37.3	36.9	25.4	27.7	11.9	9.2
<b>Total</b>	<b>32.0</b>	<b>40.1</b>	<b>7.6</b>	<b>14.8</b>	<b>24.4</b>	<b>25.3</b>

## Discussion and conclusion

In this paper, the relationship between trends in unwanted and overall fertility has been investigated using DHS data from Ethiopia and Eritrea. In particular, we tried to address the issue of how closely the proportion of women who report wanting no more children and unwanted total marital fertility (UTMF) relate to the total marital fertility (TMF) in the two countries which have both experienced some fertility decline in recent years. We also explored whether the level of unwanted childbearing depends on where the country is in the course of its fertility transition and whether this may predict the prospects for future fertility decline in the two countries.

Information on reproductive preferences is important to those concerned with trends in fertility (Westoff 1990). The proportion of unwanted births typically is low in countries with very low or very high fertility levels; it is highest in countries with intermediate levels of fertility (Bongaarts 1990). Using DHS data from 11 developing countries, Adetunji (2001) found that the risk of having unwanted fertility is low in countries with a TFR above 6 or below 3 and the highest among those with a TFR in between this range. The results in this study indicate that although the association between overall and unwanted fertility is complex and differs by country, some broad patterns exist that have implications for policy and theory. The association seems to be in the expected direction, particularly for Ethiopia. In this country, the level of unwanted marital fertility and proportion of women wanting no more children are high as the country is moving from a high to low fertility regime. These results tend to support the conclusions reached by Bongaarts (1997) and Adetunji (1998b, 2001). In Eritrea, however, the association does not seem to reflect the expected pattern. The proportion of women wanting no more children and of unwanted marital fertility are still low in Eritrea while the level and trend of its marital TFR is similar to that of Ethiopia. That is, despite Eritrea's declining overall fertility, its unwanted fertility and proportion of women wanting no more children remained almost constant between the surveys we cover. This means that the level of unwanted fertility in Eritrea does not seem to predict the position this country has in the course of fertility transition.

What do these findings suggest in relation to the prospect for future fertility decline in the two countries? First, as fertility levels begin to decline, we should expect to see a rise in the proportion of women wanting to stop childbearing or in the level of unwanted pregnancies. The results from the Ethiopian surveys reveal that the level of unwanted fertility and proportion of women wanting no more children has increased as total marital fertility declined. Thus, as Ethiopia moves from a high to low fertility regime, the level of unwanted fertility is likely to increase further unless concerted efforts are made to curb it. The increase in the desire to stop having children in Ethiopia supports the hypothesis that there is a growing demand for fertility limitation. On the other hand, in Eritrea such a relationship is not evident from our analysis. In this country, although marital fertility has declined since the 1995 survey, there is no sign of increases in unwanted fertility, in fact, there is a slight decrease. Thus, it seems to be difficult to make any prediction on the future fertility change in Eritrea from the level of its current unwanted childbearing. One important finding from this study is, however, a relatively large proportion of women in

Eritrea that report “undecided” on the question whether they want additional children. This may imply some prospect for fertility reduction if women are persuaded to practice contraception in cases when they do not definitely want to conceive. Our results may to some extent be explained by the effects of the recent war. The uncertainty of peace may depress the desire for fertility and the urge to make decisions on reproductive intentions in Eritrea, where the impact of war has been much stronger than in Ethiopia.

In terms of fertility control, family planning efforts should focus on making contraception available to couples in Ethiopia who have already decided that they do not want any more children. If family planning programs succeed in helping women in this country to achieve the family size they claim they want, total marital fertility will be reduced by some 22%. Therefore, in Ethiopia, family planning programs need not only strengthen family planning incentives to reduce desired family size, but also to provide services to minimize or eliminate unwanted fertility. In Eritrea, on the other hand, unwanted fertility is at a very low level, and family planning programs can only bring very little change on overall fertility by trying to reduce unwanted births. In this case, to reduce total fertility, family planning programs need to intensify their efforts to bring down desired family size. Countries where a large proportion of births are unwanted can achieve lower fertility by eliminating or minimizing the occurrence of unwanted births. Conversely, when the level of unwanted fertility is low and the overall fertility is high a country still has to experience an increase in unwanted fertility (Adetunji 2001).

In these countries, factors that are usually associated with low levels of fertility, such as urban residence and higher education are also associated with low levels of wanting an additional child and high levels of wanting no more children. Higher parity women and women with long marital durations are also more likely to report wanting no more children.

Although the DHS surveys provide good information for analyzing reproductive preferences, there are some possible sources of biases in the data. First, because these data were collected retrospectively, there is the possibility of post facto rationalization of behavior. This may occur because of various considerations occurring after a birth; a birth may be reported as rightly timed or wanted even though that was not the feeling when the pregnancy was first noticed. Another possible source of bias in the data is the lack of the opinions of husbands. A husband’s opinions are still dominant in decisions about fertility in Africa, including Ethiopia and Eritrea. It may be the case that a woman’s expressed intention is not similar to that of her husband. A woman may express the view that she does not want to have another child, but her husband may or may not agree with her. In many cases, husband and wife do not discuss such issues, particular in the rural areas of Ethiopia and Eritrea, where societal control over women’s rights and husband’s dominance is common.

In conclusion, we suggest that the best way to establish changes in fertility intentions over the course of fertility transition is to observe levels in a population when it experiences high, medium, and low fertility. Pertinent data to do such analyses are not yet available for the two countries we study here. Nevertheless, until appropriate data



become available, the evidence presented here provide valuable information for our understanding on the relationship between fertility and fertility intentions and the prospects for future fertility change.

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