EVIDENCE OF RECENT FERTILITY DECLINE IN ERITREA: AN ANALYSIS OF TRENDS AND DETERMINANTS

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The period between mid-1990s and the early part of the new century has witnessed a substantial and rapid decline in fertility in Eritrea. Total fertility rate has declined by about 30%, from a high level of 6.4 in 1994/95 to 4.5 children per woman in 2000/01. The decline occurred in both rural and urban. This recent decline in fertility has been a subject of discussion among demographers and health professionals in the country because there has not been an increase in family planning nor substantial improvements in socio-economic developments that are generally expected for the decline to occur. The contraceptive prevalence rate among currently married women has remained constant at 8% during the period. It is also difficult to say that major improvements in the social and economic environment has occurred in Eritrea. Even though there was some improvements in education and economic staus of the country between 1994 and 1997, the period from mid-1998 to 2001 was one of war and economic crises in Eritrea with large military mobilization, population displacement, housing shortages in urban areas, severe disruption of the economy and high inflation caused by the border conflict with Ethiopia. Although the country has had relative peace since 2001, it has suffered for the last few years from a considerable crisis-induced hardships because of the border conflict which is still unresolved, even though at much lower scale.

Although the overall level and trend of fertility is known, the nature and dynamics of the decline and the possible factors that contributed to the onset of the decline are yet not documented in Eritrea today. At present, the investigation of demographic aspects, especially of fertility in the country is sketchy. This study, therefore, is an attempt to start filling a significant void in Eritrean demographic studies. It tries to examine the extent of the fertility decline at both national and sub-national levels and the main contributors to the overall decline. It will attempt to improve our understanding of whether the observed decline in fertility indicates the onset of a long-term fertility transition or if it is a short-term response to the border war with Ethiopia that started in mid-1998 lasted through 2001.

The major source of data for this study is the 2002 Eritrea Demographic and Health Survey (EDHS). The details of the survey may be seen elsewhere (National Statistics and Evaluation Office and ORC MACRO, 2003). This survey covered a nationally representative sample of 9,389 households with 39,573 population of which 17,865 were male and 21,703 female. Among the occupied households, 8,754 women aged 15-49 at the time of the survey were interviewed of which 6,903 were currently or formerly married. The analytical strategy followed is as follows: First, trends in fertility by period and age of women were examined at urban, rural and national levels over the period fifteen years prior to the survey (1987-2001) that encompasses

both periods of hostilities in 1987 to mid-1991 (war for independence) and mid-1998 to 2001 (border conflict with Ethiopia) as well as the period of peacefulness from 1992 to mid-1998. The second level of analysis, uses multivariate regression models to investigate the possible factors that influenced fertility and its decline. For analytical purposes, first births and second or higher order births were treated separately at the second level of analysis.

The findings from the trend analysis show that while little change in overall fertility occurred before independence (1991), it peaked in mid-1990s, about four years after independence and then declined starting from 1996 and it continued through the late of 1990s to reach its lowest level in 2001. In other words, the decline started well before the border war with Ethiopia, but the extent of the decline was faster during the peak years of the border war (1999-2001). It was estimated that between 1996 and 1998, TFR has declined by 22%, but between 1999 and 2001, it declined even more (by 26%). The results of the trend analysis also reveal that the decline in fertility was across all reproductive ages, all birth orders and in both rural and urban areas of the country, although the magnitude of the change differs.

The multivariate models confirm that there were significant differential effects of period on fertility in Eritrea. Women were less likely to have children during 1996-2001 than the period before that time. In addition to period, the other significant determinants of fertility are marital status, childhood residence, education of mother, age of mother at birth of previous child and birth order. Never married women are less likely to have their first births than married women. This is possibly a result of a rise in age at first marriage among younger cohorts of women. Preliminary analysis shows that the median age at marriage among women aged 20-49 increased between 1995 and 2002 from 16.8 to 18.2. A multivariate analysis on first marriage risks also indicate that the risk of marriage is significantly lower in the most recent period. Even among married women, the propensity to have a first birth has declined. Trends in higher order births and among older mothers are similar in direction to those of first births, although the decline is much stronger among higher order parities (4 or more) and older mothers (35 years or older). These are clear indications that an increasing number of Eritrean women are reaching their desired family size after their fourth or fifth child and/or after 35 years or older. In general, the evidence of this study suggests that the observed decline in marital fertility is the main contributor to the overall fertility decline although a delay in age at marriage might have played some part. More educated and urban women are also more likely to have lower fertility, but the effect of urban-rural disppeared after controlling for marital status in the first birth model.

Although it is difficult to establish a direct causal link between the war and fertility in Eritrea, the findings offer some evidence that the war might have accelerated fertility decline. As it is indicated above, the decline is much faster during the crisis period than before it. A decrease in fertility by 26% within that short period seems unlikely. This is too large to be attributed only to earlier stopping child birth and to some degree to a delay in age at first marriage (or the onset of reproduction), it may also reflect to some extent the impact of the war. The impact of the war could probably be through different mechanisms: a largely unintentional limiting of births due to social and economic disruptions directly caused by the military mobilization, fighting and consequent population displacement or intentional fertility regulation because couples

are more likely to opt for avoiding births during the time of trouble. Comparison between the 1995 and 2002 EDHS survey data also indicates that the proportion of women not residing with their husbands was higher in all age groups, especially in the younger cohorts in 2002 than in 1995. This increase is most likely a reflection of the military mobilization or displacement of people as a result of the border conflict. Thus, the border war either directly or indirectly might have affected the decline in fertility. But, this does not mean to conclude that the reduction in fertility is primarily the outcome of the border conflict (or a sudden phenomenon) as there are evidences that the reduction has already started before the eruption of the border conflict, and it is plausible to suggest that the decline indicates the beginning of a long-term fertility transition fuelled by a temporary result of the 1998-2001 conflict and economic crisis.

Table 1: Relative risks of fertility (1st births) associated with selected socio-economic variables

Variable	Model 1	Model 2
Period[t]		
<1988	0.64***	0.58***
1988-91	0.88***	0.83***
1992-94	0.75***	0.75***
1995-98	1	1
1999-00	0.73***	0.78***
2001-02	0.67***	0.71***
Childhood residence		
Rural	1	1
Urban	0.62***	1.14***
Marital status		
Never married -		1
Married -		21.36***
Degrees of freedom	6	7
Model statistic (χ^2 statistic)	332.08	7477.25

* Factor level significant at <10%, *** significant at <1%
[t] Time varying covariate

Table 2: Relative risks of fertility (1st births) associated with selected Socio-economic variables

Variable	Model 1	Model 2	Model 3
Period[t]			
<1988	0.53***	0.57***	0.58***
1988-91	0.79***	0.82***	0.83***
1992-94	0.74***	0.75***	0.76***
1995-98	1	1	1
1999-00	0.81***	0.80***	0.80***
2001-02	0.74***	0.72***	0.71***
Childhood residence			
Rural	1	1	1
Urban	1.26***	1.19***	1.08
Age at 1st marriage			
≤15	-	1	1
16-19	-	1.39***	1.38***
20+	-	1.55***	1.55***
Education of mother			
No education	-	-	1
primary	-	-	1.16***
secondary or higher	-	-	1.20***

Degrees of freedom	6	8	10
Model statistic (χ^2 statistic)	348.05	525.63	546.07

* Factor level significant at <10%, *** significant at <1%

[t] Time varying covariate

Note: The models in Table 2 are fitted using time since 1st marriage as time factor in order to check the effect of marital status on the occurrence of 1st births (see Table 1).
The time factor used in Table 1 is age of women (since 12th birthday)

Table 3: Relative risks of fertility (higher birth orders - 2+ births) associated with selected Socio-economic variables

Variable	Model 1	Model 2	Model 3
Period[t]			
<1988	0.97	0.96	0.94
1988-91	1.19***	1.19***	1.17***
1992-94	1.07***	1.06**	1.05***
1995-98	1	1	1
1999-00	0.75***	0.75***	0.75***
2001-02	0.66***	0.66***	0.66***
Age of mother			
≤19	1	1	1
20-24	1.03	1.04	1.04*
25-29	1.03	1.04	1.03
30-34	0.94**	0.95*	0.94**
35-39	0.79***	0.79***	0.79***
40-49	0.57***	0.57***	0.56***
Birht order			
2-3	1	1	1
4-5	1.02	1.01	0.99
6-7	1.01	0.99	0.97
8+	0.89***	0.87***	0.85***
Childhood residence			
Rural	-	1	1
Urban	-	0.78***	0.93***
Education of mother			
No education	-	-	1
primary	-	-	0.85***
secondary or higher	-	-	0.66***
Degrees of freedom	13	14	16
Model statistic (χ^2 statistic)	1159.73	1257.87	1297.42

* Factor level significant at <10%, *** significant at <1%

[t] Time varying covariate

Table 4: Interaction between period and age of mother in fertility (2nd and higher birth orders)

	Age of mother					
Period	≤19	20-24	25-29	30-34	35-39	40-49
Before 1998	1	1.06	1.09	0.99	0.87	0.66
1999-2002	0.77	0.77	0.71	0.68	0.50	0.36
Change in degrees of freedom (Δdf)			5			
Change in model statistic ($\Delta\chi^2$ statistic) p=0.000			25.83			

Table 5: Interaction between period and birth order in fertility (2nd and higher birth orders)

	Birth order			
Period	2-3	4-5	6-7	8+
Before 1998	1	1.02	1.00	0.86
1999-2002	0.74	0.66	0.63	0.57
Change in degrees of freedom (Δdf)		3		
Change in model statistic ($\Delta\chi^2$ statistic) p=0.000		15.23		

Period is collapsed into two categories because preliminary interaction results indicate that the relative risks for the period before 1999 were similar.

Table 6: Relative risks of first marriages

Variable	Model 1	Model 2
Period[t]		
<1988	0.96	0.88***
1988-91	1.04	0.99
1992-94	1.00	0.98
1995-98	1	1
1999-00	0.80***	0.81
2001-02	0.93*	0.94
Childhood residence		
Rural	-	1
Urban	-	0.48***
Degrees of freedom	5	6
Model statistic		

(χ^2 statistic)	27.92	520.05

* Factor level significant at <10%, *** significant at <1%
[t] Time varying covariate

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NOTE: The effect of r-u disappeared when marital status is added to the model, but this may be due to confounding effect. Infact when we include the interaction term beween r-u and marrital status. It increased again significantly (see Table below). NOT to be used.

Table 1(b): Interaction between period and rural-urban (1st births)

	Rural-urban	
Period	Rural	Urban
Before 1998	1	1.11
1999-2002	0.97	1.36
Change in degrees of freedom (Δdf)	1	
Change in model statistic ($\Delta\chi^2$ statistic) p=0.000	7.55	

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