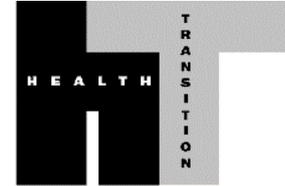


## Fertility decline in Bangladesh: toward an understanding of major causes \*



Barkat-e-Khuda<sup>a</sup> and Mian Bazle Hossain<sup>b</sup>

<sup>a</sup>The Population Council, New York; <sup>b</sup>ICDDR,B, Bangladesh

### Abstract

Bangladesh has undergone a considerable decline in fertility, despite the absence of conditions believed to be necessary for such reproductive changes. Indeed, Bangladesh is the only one among the world's twenty poorest countries where such a change has occurred. The paper examines the nature of fertility transition in Bangladesh, looks at the trends in contraceptive use and fertility, and identifies the major factors accounting for the fertility decline, despite poor socio-economic conditions. Two types of factors in the decline are: (a) positive factors which encourage eligible couples to contracept, and (b) negative factors which compel women to contracept, for spacing or limiting births. The effects of positive and negative factors on contraceptive use and fertility are analysed with data from a rural sample of 4,194 women from the 1993-94 Bangladesh Demographic and Health Survey (BDHS), 2,597 women from the MCH-FP Extension Project area, and 8,110 women from the Matlab MCH-FP Project area. Logistic regression is used in the analysis. Strong and highly significant effects of female education, female employment and access to media on contraceptive use and fertility have been found.

Bangladesh is the ninth most populous country in the world. According to the 1991 Population Census, it had a population of over 111 million people, increasing at an annual growth rate of around two per cent (Government of Bangladesh 1991:6). Today, the country has an estimated population of over 120 million people. Except for some island states, Bangladesh has the highest population density in the world.

Resource scarcity and subsistence-level economic conditions characterize the Bangladesh economy (see Khuda 1991). Bangladesh is predominantly dependent on land, with agriculture as its primary industry<sup>1</sup>. Increasing population pressure on the land, is continually decreasing the land-man ratio: from 49 decimals in 1951 to 20 decimals in 1991. Although high-yielding variety technology has expanded since the early 1960s, covering over one-quarter of cultivable land area, the per hectare yield is among the lowest in the world (Khuda, Barkat and Helali 1991).

---

\* This study was funded by the United States Agency for International Development (USAID) under grant No. 388-0071-A-00-3016-00 with the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). An earlier version of the paper was presented at The Continuing Demographic Transition Seminar in honour of Professor John C. Caldwell, the Australian National University, Canberra, Australia, 14-16 August 1995. The authors are grateful to the key discussant, Dr. Steven Sinding, Director, Population Division, Rockefeller Foundation, and other seminar participants for their valuable comments and suggestions.

<sup>1</sup>The share of agriculture in the GDP continues to be quite high, though its relative share has been declining over time, down to 37 per cent in 1988-89 from about 45 per cent in 1984-85. There is virtually no change in the relative share of industries in the GDP, remaining at only about 10 per cent (Khuda, Barkat and Helali 1991).

Socio-economically, Bangladesh is comparatively disadvantaged in terms of such key indicators as per capita income (US\$ 220 in 1991, World Bank 1993) and proportion living below the poverty line (78% of total population and 86% of rural population, UNDP 1994). Consequently, the Bangladesh economy is characterized by extremely low savings and investments. Both the per capita food production index and daily calorie supply as percentages of requirements (83%) are quite low in Bangladesh. The overall literacy rate is only 37 per cent: males 49 and females 23 per cent. Female school attendance is low, and there is an uneven ratio of male to female school enrolment, especially beyond the primary level (Khuda and Barkat 1992).

Life expectancy in Bangladesh continues to be quite low. Bangladesh is one of the few countries in Asia where female life expectancy remains lower than that of males. This is due in part to multiple high-risk pregnancies. The country is disadvantaged regarding access to health services (60% during 1985-91), safe drinking water and sanitation (32% during 1988-91), as well as with respect to both population-nurse (8,340 in 1990) and doctor-nurse ratios (0.8 in 1990) (UNDP 1994). Continued high infant and childhood mortality result from relatively weak prenatal and postnatal services, less than optimal birth spacing, and widespread malnutrition among children.

Despite pervasive poverty and underdevelopment, however, Bangladesh has achieved a considerable decline in fertility. Indeed, Bangladesh represents an apparent anomaly for its decline in fertility, despite the absence of conditions believed to be necessary for such reproductive changes. Bangladesh is the only country among the world's twenty poorest countries where such a change has occurred.

This paper examines the nature of fertility transition in Bangladesh.

## **Data and methodology**

Three main sources of data were used in this analysis: various national surveys, particularly the 1993-1994 Bangladesh Demographic and Health Survey (BDHS); longitudinal data from the ICDDR,B Matlab Maternal Child Health and Family Planning (MCH-FP) Project Record Keeping System (RKS) and Demographic Surveillance System (DSS); and longitudinal data from the ICDDR,B MCH-FP Extension Project (Rural) Sample Registration System (SRS).

The MCH-FP Extension Project (Rural) is a collaborative effort of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) and the Ministry of Health and Family Welfare (MOHFW) of the Government of the People's Republic of Bangladesh, supported by the Population Council. Its purpose is to improve the delivery of maternal and child health and family planning services through the MOHFW program.

The 1993-94 BDHS employed a nationally-representative, two-stage sample. A total of 8,168 rural households were selected for the sample, of which 7,798 were successfully interviewed. Of the interviewed rural households, 8,390 women were identified as eligible for interviews and the interviews were completed for 8,174 women. Of these 8,174 rural sample women, there were 4,194 who were married throughout the entire reference period<sup>2</sup> and they were included in the analysis while those women who were not married throughout the entire reference period were excluded from the analysis.

---

<sup>2</sup>The reference period used for the MCH-FP Extension Project and Matlab is ten years before 1994; however, a six-year reference period (1988-94) has been used for the 1993-94 BDHS because of non-availability of data preceding 1988.

The second data set was taken from the ICDDR,B Matlab MCH-FP Project.<sup>3</sup> Since its inception, the Matlab MCH-FP Project has been collecting longitudinal data from its catchment area population on contraceptive use dynamics, immunization, through its RKS, and on demographic events such as births, deaths, migration, change in marital status through its DSS. A total of 8,110 married women of reproductive age who were married throughout the entire reference period were included in this analysis, while those who were not married throughout the entire reference period were excluded from the analysis.

The third data set was taken from the ICDDR,B MCH-FP Extension Project (Rural).<sup>4</sup> Since its inception, the MCH-FP Extension Project has been collecting longitudinal data on demographic events as well as on selected variables to monitor the impact of the Project's different interventions on contraceptive use dynamics (see Mozumder et al. 1991). A total of 2,597 married women of reproductive age who were married throughout the entire reference period were included in the analysis, while those who were not married throughout the entire reference period were excluded from the analysis.

In addition to data on the two dependent variables, namely, contraceptive use and fertility, data on such selected client characteristics as education, age, religion, children born before the reference period, employment status, possession of a sealed latrine, possession of a radio, sources of drinking water, landholding, and electricity (in the case of the 1993-94 BDHS) were used.

The number of births to each woman during the reference period was calculated from all three data sets. Two categories of each dependent variable were used: no children born and one or more children born during the reference period, and use of any family planning method and never-use of any method during the reference period.

Data on children born before the reference period were excluded from Model II for each of the regressions in order to see the effect of other independent variables on contraceptive use and fertility, without controlling for the effect of children born before the reference period. Results presented in Tables 1 and 2 show no significant change, after excluding data on children born before the reference period from the model.

A composite score was developed, using almost all the covariates of each data set. The scores for the different variables were assigned as follows: education (no education=0, any education=1); employment status (housewife=0, other than housewife=1); sources of drinking water (tubewell=1, other than tubewell=0); possession of latrine (sealed latrine=1, other=0); possession of radio (yes=1, no=0); possession of land (no land=0, any land=1); and electricity (women belonging to households with electricity connected=1, and those without electricity=0). Other variables such as age of women, religion, and children born before the reference period were not used in building the composite scores. Scores of each individual variable were added to give a composite score, ranging from 0 to 6 for the ICDDR,B SRS and DSS, and from 0 to 7 for the 1993-94 BDHS. Using the composite score as an independent

---

<sup>3</sup>A major goal of the Project has been to assess whether a village-based maternal-child health (MCH) and family planning (FP) service delivery system can substantially reduce fertility and mortality in an unfavourable rural setting like Bangladesh. For more detailed description of the Project and area, see Bhatia et al. (1980), Phillips et al. (1982, 1984, 1988), and D'Souza (1986).

<sup>4</sup>Since 1982, the MCH-FP Extension Project has worked in close collaboration with the Government of Bangladesh to improve the national family planning and MCH service delivery system. The Project field sites are located in the rural *thanas* (subdistricts) of Sirajgonj and Abhoynagar in central and western Bangladesh respectively. In mid-1994, the Project opened a new laboratory area, Mirsarai Thana in Chittagong District. However, no data from Mirsarai Thana have been used in this paper, since there are no trend data as yet.

variable, logistic regression was carried out to see the effect of the composite score on the use of contraception as well as on fertility.

### **Selected variables and possible mechanisms of change in reproductive behaviour**

Because of lack of data, it is not possible to examine the process through which each factor may have affected contraceptive use and fertility behaviour. This is planned for the second phase of the study, scheduled to begin around the middle of 1996. However, the possible mechanisms whereby the selected variables may have affected reproductive behaviour are discussed below.

#### ***Education***

Although literacy continues to remain quite low in Bangladesh, it has shown some improvement over the years. Between 1973 and 1992, primary school enrolment increased by 48 per cent for boys (rising from 5,060,000 to 7,472,000) and for girls by over two times (from 2,698,000 to 6,245,000). During the same period, secondary school enrolment increased by 85 per cent for boys (from 1,343,000 to 2,480,000) and by over three times for girls (from 498,000 to 1,529,000) (Government of Bangladesh 1994).

How may female education have affected contraceptive use and fertility decline? There are at least three possible mechanisms of change: female education creates more favourable fertility attitudes and norms; it empowers women in household decision-making, including matters related to contraceptive use, fertility, children's schooling and health care; and it increases prospects of female employment.

#### ***Female employment***

There has been an increase in the number of females in the workforce, both nationally as well as in the rural areas. However, there is also evidence of poverty-driven female employment, resulting from poor household economic conditions, high rates of female headships either *de jure* or *de facto* as a result of temporary male out-migration (Safilios-Rothschild and Mahmood 1989), and higher incidence of female headships among the poor and landless households (Bangladesh Institute of Development Studies 1990; Rahman and Hossain 1991). Rahman (1986) found that between 8 and 24 per cent of households in Faridpur and Tangail districts send their women in search of wage employment, and the proportion is much higher among poorer households: 50-77 per cent. The same study also found that there has been a rise in female employment since the mid-1970s, and argued that the pressures of poverty may have been critical in sending women out in search of work.

Female employment may have affected contraceptive use and fertility in at least three ways: female employment creates more favourable fertility attitudes and norms; it empowers women in household decision-making; and it increases opportunity costs associated with childbearing.

#### ***Access to mass media***

Radio ownership has increased from less than ten per cent in the early 1970s to around 25 per cent in 1989 (Huq and Cleland 1990). The role of mass media, especially radio, in popularizing the family planning movement in many of the developing countries is widely recognized. The utility of radio is far greater than its price. Villages in Bangladesh are less isolated today, having been linked to the outside world by the mass media (Cleland et al. 1994). This linkage promotes diffusion of ideas not only about family planning but also about

lifestyles. The ideational hypothesis argues that reproductive behaviour is affected by such ideas (Cleland and Wilson 1987).

**Access to safe drinking water and sanitation**

Access to safe drinking water and improved sanitation has increased over time, though there is still considerable room for improvement.

Access to tubewell drinking water and to sealed latrines represents a status symbol in the rural areas. Also, they ensure better health for all, and thereby contribute to reduction in infant and child mortality, and hence, the desired family size. Furthermore, access to tubewells and sealed latrines reflects rising living standards and aspirations, and thereby raises the relative cost of bringing up children and reduces the economic utility of children.

**Landownership**

Increasing population pressure on the land is continually decreasing the land-man ratio, from 49 decimals in 1951 to 20 decimals in 1991. In the process, a large proportion of the rural population has been rendered functionally landless. Also, the average size of farms has diminished rapidly, from 3.5 acres in 1960 to less than two acres now (Government of Bangladesh 1994). Furthermore, there has been greater skewness in the distribution in farm size. Farms were divided evenly in the categories of small and medium farms in 1960, but in a span of two decades 70 per cent of holdings were in the small farmholding category (Huq and Cleland 1990). Indeed, the overall economic situation suggests that living standards for the vast majority have stagnated for most of the past three decades.

How have the worsening landholding situation and the overall economic condition affected reproductive behaviour in Bangladesh? It is likely to have been affected in least four ways: demand for labour in agriculture has been adversely affected; there has been a rise in rural unemployment and underemployment, affecting adults as well as children; there is a declining labour utility of children (plus increased direct costs of children, thus altering the economic value of children, and thereby, changing reproductive preferences); and a combination of near-stagnant real wages, shrinking farm sizes, chronic unemployment and underemployment, and deepening poverty may provide the conditions for a radical reassessment of the desired numbers of children.

**Findings**

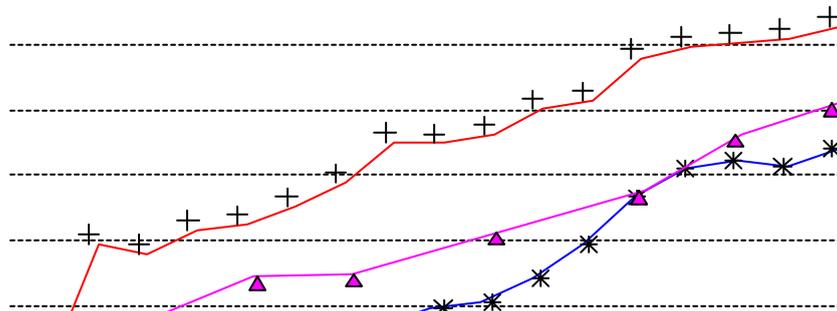
The successive governments in Bangladesh have attached top priority to containing the rate of population growth and, accordingly, strengthened and intensified the family planning program efforts (see Khuda 1984; Khuda et al. 1991, 1992, 1993, 1994). This has resulted in a near-universal awareness of at least one family planning method as well as increasingly positive attitudes toward contraception. Between 1975 and 1993/94, ever-use of any method of family planning increased by about five times (Khuda et al. 1992; Khuda and Barkat 1994). During the same period, the national contraceptive prevalence rate (CPR) increased by about six times. The CPR in Matlab increased by about five times, and the Matlab CPR is considerably above the national average and that of the MCH-FP Extension Project areas (Figure 1).

**Figure 1**  
**CPR In Bangladesh: 1975-94**

Matlab RKS

MCH-FP SRS

National

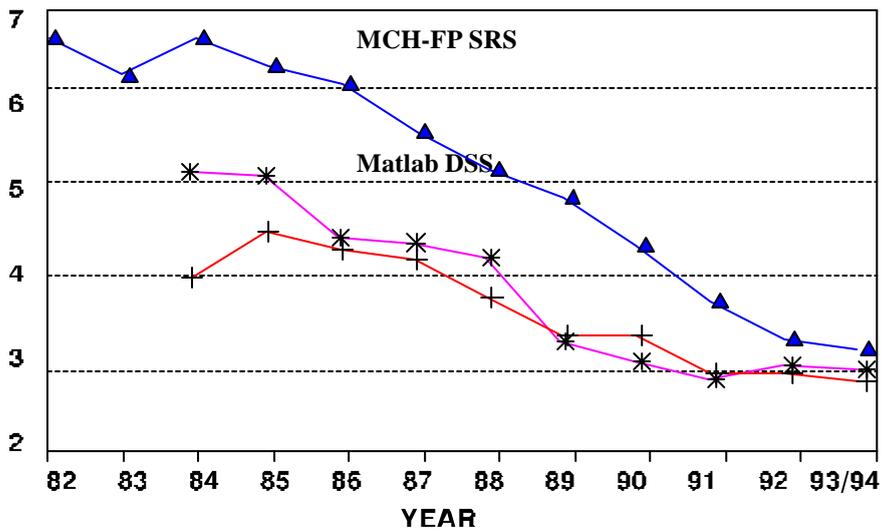


The appreciable increase in the CPR over time has resulted in a sharp decline in fertility, with the total fertility rate (TFR) declining from over seven in the mid-1970s to less than four in 1993-94 (Figure 2).

Figure 2 TFR in Bangladesh: 1975-94

National

TFR per woman



**Table 1**  
**Logistic regression estimates of the odds ratios (OR=exp(B)) of characteristics of married women of reproductive age on contraceptive use in Bangladesh**

Characteristics	1993-94 BDHS		MCH-FP Extn		Matlab MCH-FP	
	Model I	Model II	Model I	Model II	Model I	Model II
<b>Education</b>						
No education (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Primary	1.68***	1.66***	1.98***	1.95***	1.42**	1.44**
Above primary	2.31***	2.06***	2.37**	2.06*	1.52*	1.27
<b>Age of Women (in years)</b>						
< 25 (RC)	1.00	1.00	1.00	1.00	1.00	1.00
25 - 29	0.91	1.36***	0.44***	0.90	0.48***	1.19
30 - 39	0.69**	1.39***	0.18***	0.56***	0.16***	0.84
<b>Religion</b>						
Muslim(RC)	1.00	1.00	1.00	1.00	1.00	1.00
Hindu and others	1.20	1.15	1.50*	1.33	1.53**	1.47*
<b>Employment status</b>						
Housewife (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Other than housewife	1.62***	1.63***	3.22	3.29	1.09	1.17
<b>Possession of latrine</b>						
Sealed latrine	1.23*	1.20	1.02	1.09	1.07	1.13
No sealed latrine (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Source of drinking water</b>						
Tubewell	1.39**	1.36**	1.59***	1.60***	1.22	1.23
Other than tubewell (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Possession of radio</b>						
Yes	1.45***	1.43***	1.73**	1.75**	1.10	1.04
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Land ownership</b>						
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.14	1.14	0.79*	0.80*	1.01	0.99
<b>Electricity connection in household</b>						
No (RC)	1.00	1.00	a	a	a	a
Yes	1.05	1.08	a	a	a	a
<b>Children born before reference period</b>						
0 (RC)	1988		1984		1984	
1 - 2	1.00	-	1.00	-	1.00	-
3 - 4	2.06***	-	2.14***	-	3.42***	-
5+	3.56***	-	5.32***	-	12.80***	-
	3.18***	-	7.56***	-	19.76***	-
-2log likelihood	4911***	5011	2120***	2189***	3068***	3262**
N	4194	4194	2597	2597	8110	8110
df	14	11	13	10	13	10
Other coefficient of the model:						
Intercept	-0.62***	-0.20	0.76***	1.44***	1.70***	2.64***

\* p< .05; \*\* p< .01; \*\*\* p< .001

<sup>a</sup>Data not obtained

Source: Calculated by the authors from three different data sources as mentioned above.

**Table 2**  
**Logistic regression estimates of the odds ratios (OR=exp(B)) of characteristics of married women of reproductive age on the proportion who have not had any birth during the reference period in Bangladesh**

Characteristics	1993-94 BDHS		MCH-FP Extn		Matlab MCH-FP	
	Model I	Model II	Model I	Model II	Model I	Model II
<b>Education</b>						
No education (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.98	0.98	1.49**	1.50**	1.30***	1.32***
Above primary	0.97	0.91	1.71**	1.72**	1.75***	1.68***
<b>Age of Women (in years)</b>						
< 25 (RC)	1.00	1.00	1.00	1.00	1.00	1.00
25 - 29	1.71***	2.08***	3.36***	3.19***	4.44***	5.61***
30 - 39	3.86***	5.82***	7.63***	6.79***	15.64***	25.63***
<b>Religion</b>						
Muslim(RC)	1.00	1.00	1.00	1.00	1.00	1.00
Hindu and others	1.51***	1.45***	2.12***	2.15***	2.13***	2.08***
<b>Employment status</b>						
Housewife (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Other than housewife	1.40***	1.40***	2.68*	2.70*	1.63*	1.53
<b>Possession of latrine</b>						
Sealed latrine	1.11	1.09	1.38**	1.37**	0.87	0.89
No sealed latrine (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Source of drinking water</b>						
Tubewell	0.71**	0.71**	2.39***	2.38***	0.88	0.88
Other than tubewell (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Possession of radio</b>						
Yes	1.50***	1.49***	1.16	1.16	1.02	1.02
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Land ownership</b>						
No (RC)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.02	1.03	0.78*	0.78*	0.98	0.97
<b>Electricity connection in household</b>						
No (RC)	1.00	1.00	a	a	a	a
Yes	1.02	1.03	a	a	a	a
<b>Children born before reference period</b>						
0 (RC)	1.00	-	1.00	-	1.00	-
1 - 2	2.06***	-	2.14***	-	3.42***	-
3 - 4	3.56***	-	5.32***	-	12.80***	-
5+	3.18***	-	7.56***	-	19.76***	-
-2log likelihood	4653***	4688***	2516***	2519***	6593***	6661***
N	4194	4194	2597	2597	8110	8110
df	14	11	13	10	13	10
Other coefficient of the model:						
Intercept	-1.93***	-1.82***	-2.82***	-3.08***	-3.03***	-3.51***

\* p< .05; \*\* p< .01; \*\*\* p< .001

<sup>a</sup>Data not obtained

Source: Calculated by the authors from three different data sources as mentioned above.

Tables 1 and 2 show the logistic regression estimates of odds ratios for the effect of selected characteristics of married women of reproductive age on contraceptive use and fertility respectively. Odds ratios (OR) are shown in place of regression coefficients for easy interpretation of results. An OR below 1.00 means a negative effect of an independent variable, while an OR above 1.00 means a positive effect. The first two panels, second two panels and third two panels of the table respectively give the results based on data from the 1993-94 BDHS, the MCH-FP Extension Project, and the Matlab Project. The results are in the expected direction for most variables.

The probability of contraceptive use rises with education. It is higher among working women than among housewives, among women belonging to households with sealed latrines than those without, among women belonging to households using tubewell for drinking water than those without, among women who belong to households having radios than those without, and among women belonging to households with electricity connections than those without. There is little or no effect of landholding on contraceptive use, indicating that the probability of using contraception is almost the same among the landed as well as the landless, implying poverty-led demand for contraception among the poor. Also, it is possible that there is some aspiration-led demand for family planning among the poor, resulting from access to media and ideational changes.

The probability of not having given birth during the reference period is higher among the educated than non-educated women, among working women than among housewives, among women belonging to households with sealed latrines than those without, among women belonging to households with radios than those without, and among women belonging to households with electricity connections than those without. Similarly to what has been observed with regard to contraceptive use, there is little or no effect of landholding.

**Table 3**  
**Logistic regression estimates of the odds ratios (OR=exp(b)) of composite score on any family planning method use during the reference period**

	DSS/RKS	1993-94 BDHS	MCH-FP Extn. SRS	Matlab DSS/RKS
Score		1.37***	1.33***	1.13***
Other coefficient of the model:				
Intercept		0.01	1.12	2.65

\* p < .05; \*\* p < .01; \*\*\* p < .001

Source: Calculated by the authors from three different data sources as mentioned above.

Tables 3 and 4 show the logistic regression estimates of odds ratios for the effect of composite score on contraceptive use and fertility respectively. Results show that the probability of contraceptive use increases by varying proportions (13-37%) for a unit change in the composite score for the three data sets. Also, results show that the probability of not having given birth during the reference period increases by varying proportions (9-35%) for a unit change in the composite score for the two data sets; however, the reverse is true, though not statistically significant, for the Matlab data.

**Table 4**  
**Logistic regression estimates of the odds ratios (OR=exp(b)) of composite score on the proportion of women who have had no birth during the reference period**

	DSS/RKS	1993-94 BDHS	MCH-FP Extn. SRS	Matlab DSS/RKS
Score		1.09***	1.35***	0.97
Other coefficient of the model:				
Intercept		-1.05	-1.73	-1.21

\* p< .05; \*\* p< .01; \*\*\* p< .001

Source: Calculated by the authors from three different data sources as mentioned above.

## Discussion

Bangladesh is the best example of a country with a strong family planning program effort which has brought about a significant fertility decline, even when social and economic development is at a low level and not improving much. Bangladesh ranks low on almost every social and economic development indicator. Nevertheless, an intensive family planning program has been followed by a substantial increase in the use of contraception and the consequent fertility decline. The speed with which reproductive behaviour changed in Bangladesh, especially in the absence of much parallel change in social and economic development in the country, strengthens the argument that the family planning program has had a considerable influence on fertility decline (Freedman 1995). The Bangladesh case has, no doubt, strengthened the argument that a strong family planning program can make a positive contribution to the process of demographic transition. Already, there is evidence of the impact of family planning programs on contraceptive use dynamics (Phillips, Hossain and Koblinsky 1989; Phillips et al. 1993; Hossain, Phillips and Haaga 1994). A more pronounced effect is observed when standard quality of care is ensured (Hossain, Khuda and Phillips 1995). The evidence from Bangladesh has, therefore, challenged conventional demographic transition theory, which generally associates fertility decline with economic development. Accordingly, population scientists are trying to understand the factors that have contributed to this change in Bangladesh.

Female education has emerged as the single most important variable affecting both contraceptive use and fertility regulation. Indeed, the powerful effect of education on reproductive behaviour is undisputed. Data from the World Fertility Surveys and the Demographic and Health Surveys confirm the strong positive effect of education on reproductive behaviour (Schultz 1994; World Bank 1994). Similar evidence is also available from other studies (e.g., Cochrane 1979; Caldwell 1980; Jejeebhoy 1992). Other positive factors accounting for reproductive change in Bangladesh include female employment as well as access to safe drinking water, sanitation, and the media (radio). The evidence indicates that improvement in women's status is a critical determinant of fertility decline in Bangladesh. Most Bangladeshis and foreign observers agree that during the past two decades women's status in terms of education, employment, mobility, and decision-making power has undergone major changes. Also, there is evidence that such changes have contributed to increased contraceptive use and consequent fertility decline (Khuda et al. 1990; Khuda and Barkat 1992). Access to safe drinking water and sanitation can be argued to have had some effects on infant and child mortality, and therefore, on fertility decline. Ideational changes resulting from increased access to the media have fostered modern outlooks and attitudes, thereby lowering high-fertility norms, even among the poor. Furthermore, landlessness and impoverishment have altered the economic value of children, especially sons. Consequently, there is evidence of a poverty-led demand for contraception.

The findings have clear policy implications. The government of Bangladesh should further strengthen its family planning program efforts to accelerate the rate of fertility decline to be able to achieve replacement-level by the year 2005. While achievement of replacement-level fertility by the year 2005 would be difficult, it would not be impossible, given considerable unmet need for contraception and decline over time in the mean ideal family size. One-fifth of married women in Bangladesh have an unmet need for contraception: 10 per cent for spacing and 9 per cent for limiting births. The mean ideal family size was 2.5 children in 1994, a sizeable decline from 4.1 in 1975 (Mitra et al. 1994). Also, data from Matlab show a decline in the mean ideal family size from around 4.5 in both the treatment and comparison areas in 1975 to around 3.2 in 1990 (ICDDR, B 1994). There is now little reason to doubt that there is substantial demand for contraceptives and that supply-side approaches are having net demographic effects in Bangladesh (Phillips et al. 1982; 1988). Nevertheless, while vigorously pursuing family planning program efforts, the government should attach greater priority to development in the social sector, including enhancement of women's status, especially through increased female educational and employment opportunities; and improved access to the media. Such efforts, in addition to their direct benefits, would accelerate the process of fertility decline in the country.

## References

- Bangladesh Institute of Development Studies. 1990. *The Face of Rural Poverty in Bangladesh: Trends and Insights*. Dhaka.
- Bhatia, S., W.H. Mosley, A.S.G. Faruque and J. Chakraborty. 1980. The Matlab Family Planning Health Services Project. *Studies in Family Planning* 11,6:202-212.
- Caldwell, J.C. 1980. Mass education as a determinant of the timing of fertility decline. *Population and Development Review* 6,2:225-255.
- Cleland, J. and C. Wilson. 1987. Demand theories of the fertility transition: an iconoclastic view. *Population Studies* 41,1:5-30.
- Cleland, J., J.F. Phillips, S. Amin and G.M. Kamal. 1994. *The Determinants of Reproductive Change in Bangladesh*. Washington DC: World Bank.
- Cochrane, S. 1979. *Fertility and Education: What Do We Really Know?* Baltimore: Johns Hopkins University Press.
- D'Souza, Stan. 1986. Mortality structure in Matlab (Bangladesh) and the effect of selected health interventions. In *Determinants of Mortality Change and Differentials in Developing Countries, The Five Country Case Study Project*. Population Studies Series Report Number 94. New York: United Nations.
- Freedman, R. 1995. Asia's recent fertility decline and prospects for future demographic change. Asia-Pacific Population Research Reports No. 1. Hawaii: East-West Center.
- Government of Bangladesh. 1991. *Preliminary Report on Population Census, 1991*. Dhaka: Census Commission.
- Government of Bangladesh. 1994. *1993 Statistical Yearbook of Bangladesh*. Dhaka: Bangladesh Bureau of Statistics.
- Hossain, M.B., B. Khuda, and J.F. Phillips. 1995. The effects of outreach worker visits on perceived quality of care in two rural areas of Bangladesh. Paper presented at Annual Meeting of the Population Association of America, San Francisco, 6-8 April.

- Hossain, M.B., J.F. Phillips and J.G. Haaga. 1994. The impact of field worker visits on contraceptive discontinuation in two rural areas of Bangladesh. Paper presented at Annual Meeting of the Population Association of America, Miami, 4-7 October.
- Huq, N. and J. Cleland. 1990. *The Bangladesh Fertility Survey, 1989*. Dhaka: NIPORT.
- International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). 1991. *Annual Report 1991*. Dhaka.
- International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). 1994. *Demographic Surveillance System: Early Indicators, Matlab - 1993*. Dhaka.
- Jejeebhoy, S. 1992. *Women's Education, Fertility, and the Proximate Determinants of Fertility*. Gaborone: UNFPA Expert Group Meeting on Population and Women.
- Khuda, B. 1984. Population control in Bangladesh: the prospects. In *Demographic Transition in Asia*, ed. G.W. Jones. Singapore: Maruzen Asia.
- Khuda, B. 1991. Fertility decline amidst unfavourable socio-economic conditions: Bangladesh a test case. Paper presented at Workshop on the Development of Long-term Strategic Plan for FPAB, Cox's Bazaar.
- Khuda, B. and A. Barkat. 1992. *Female Education Scholarship Program - An Impact Study*. Report prepared for the World Bank, Dhaka. Dhaka: University Research Corporation (Bangladesh).
- Khuda, B. and A. Barkat. 1994. *The Bangladesh Family Planning Program: Key Programmatic Challenges and Priority Action Areas*. Report prepared for the 1994 ICPD on behalf of the Ministry of Health and Family Welfare, Government of Bangladesh, Dhaka, and Management Sciences for Health, Boston.
- Khuda, B., A. Barkat and J. Helali. 1991. *Agriculture Development in Bangladesh: A Macro Study on Sustainability Considerations*. Dhaka: University Research Corporation (Bangladesh).
- Khuda, B., A. Barkat, J. Helali, P.C. Miller and J. Haaga. 1994. *The Bangladesh Population Policy: Review of Ten Priority Areas*. Dhaka: University Research Corporation (Bangladesh).
- Khuda, B., A. Barkat, J. Helali, N. Shahzadi, R. Akhter and M.A. Mannan. 1992. *Literature Review for the Development of the National FP-MCH IEC Strategy*. Report prepared for Johns Hopkins University Center for Communication Programs. Dhaka: University Research Corporation (Bangladesh).
- Khuda, B., A. Barkat, E. Whitney, M. Shajahan and M. McCoskrie. 1993. *The National FP-MCH IEC Strategy for Bangladesh: 1993-2000*. Report prepared for Ministry of Health and Family Welfare, Dhaka.
- Khuda, B., S. Islam, R. Sultana, S.A. Sirajee and R.A. Laila. 1990. *Women's Savings Groups and Contraceptive Behaviour among Rural Bangladeshi Women*. Dhaka: University Research Corporation (Bangladesh).
- Khuda, B., M. Badrud Duza, M. Azizul Karim, et al. 1991. Population. In *Report of the Task Force on Bangladesh Development Strategies for the 1990s: Policies for Development*, Vol. 1. Dhaka: University Press.
- Mitra, S.N., M.N. Ali, S. Islam, A.R. Cross and T. Shaha. 1994. *Bangladesh Demographic and Health Surveys: 1993-94*. Dhaka: NIPORT, Mitra and Associates.
- Mozumder, A.B.M.K., M.A. Koenig, J.F. Phillips and S. Murad. 1991. The SRS: an innovative system for monitoring demographic dynamics. *Asia-Pacific Population Journal* 5,3:63-70.
- Phillips, J.F., M.B. Hossain and M. Koblinsky. 1989. Improving the climate of choice: the effect of organizational change on contraceptive behaviour in rural Bangladesh. Pp. 212-233 in *Choosing a Contraceptive: Method Choice in Asia and the United States*, ed. Rodolfo A. Bulatao, James A. Palmore and Sandra E. Ward. Boulder: Westview Press.

- Phillips, J.F., M.B. Hossain, R. Simmons and M.A Koenig. 1993. Worker-client exchanges and contraceptive use in rural Bangladesh. *Studies in Family Planning* 24,6:329-342.
- Phillips, J.F., R. Simmons, M.A. Koenig and J. Chakraborty. 1988. The determinants of reproductive change in a traditional society: evidence from Matlab, Bangladesh. *Studies in Family Planning* 19,6:313-334.
- Phillips, J.F., R. Simmons, G. Simmons and Md. Yunus. 1984. Transferring health and family planning service innovations to the public sector: an experiment in organization development in Bangladesh. *Studies in Family Planning* 15,2:62-73.
- Phillips, J.F., W.S. Stinson, S. Bhatia, M. Rahman and J. Chakraborty. 1982. The demographic impact of the family planning health services project in Matlab, Bangladesh. *Studies in Family Planning* 13,5:131-140.
- Rahman, H.Z. and M.B. Hossain. 1991. *Rethinking Poverty: Dimension, Process, Option*. Dhaka: BIDS.
- Rahman, R.I. 1986. *The Wage Employment Market for Rural Women in Bangladesh*. Research Monograph No. 6. Dhaka: BIDS.
- Safilios-Rothschild, C. and S. Mahmood. 1989. *Women's Roles in Agriculture - Present Trends and Potentials for Growth: Agriculture Sector Review*. Dhaka: UNDP and UNIFEM.
- Schultz, T.P. 1994. Human capital, family planning and their effect on population growth. *American Economic Review* 84,2:255-260.
- United Nations Development Programme (UNDP). 1994. *Human Development Report, 1994*. New York: Oxford University Press.
- World Bank. 1993. *World Development Report, 1993: Investing in Health*. New York: Oxford University Press.
- World Bank. 1994. *Development in Practice: Population and Development*. Washington DC..