Bangladesh Demographic and Health Survey 1993-94

EXTENDED ANALYSIS

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PREFACE

Bangladesh Demographic and Health Survey (BDHS) was conducted in 1993-94. This study provides information on basic national indicators of fertility, mortality, contraceptive behavior and maternal and child health. In addition to that the survey contained some more basic information on different critical issues which could be utilized for future policy formulation and program planning after further analysis of data. Accordingly, a program of extended analysis of the BDHS 1993/94 was undertaken. The present monograph is an outcome of the collaborative research program of NIPORT, East-West Center and other researchers in Bangladesh. I hope, the information in this monograph will be thought-provoking and useful for policy formulation and strategic planning of the national reproductive health program.

It is my pleasure to congratulate the researchers who participated in this research program and completed their assigned studies successfully and in time. I also extend my deep appreciation to the editors for their contributions in different stages of this program implementation specially reviewing and finalizing the monograph.

I express my heartfelt thanks to the professionals of East-West Center, Hawaii, USA for technical assistance. I also extend my thanks to the colleagues in the Research Unit of NIPORT for their participation and coordination in this effort.

I am thankful to the US Agency for International Development (USAID)-Bangladesh for providing funds for this program. I also express my deep sense of appreciation to Mr. Sk. Ali Noor, Head of Research, Monitoring and Evaluation Unit and Dr. Kanta Jamil, Demographer of the Office of Population and Health, USAID-Bangladesh for their efforts and professional contributions in finalizing the monograph.

I hope that the present monograph will support policy makers, program managers, and researchers in the policy development and implementation process of the national family welfare program.

(A.K.M. Rafiquz Zaman)

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CHAPTER I

BANGLADESH DEMOGRAPHIC AND PROGRAM MEASURES

The Proximate Determinants of Fertility in Bangladesh: Findings from Bangladesh Demographic and Health Survey 1993-94

M. Mazharul Islam, Abdullah Al Mamun, Radheshyam Bairagi

Introduction

Bangladesh, the most densely populated country in the world (755 persons per sq. km) with 120.8 million (BBS, 1996) people live in a comparatively small area of 144,000 sq. km., is characterized by a high population growth rate (1.8 percent annually) (BBS, 1996), high nuptiality, and low age at marriage (Amin et al., 1993; Islam and Islam, 1993). Despite the recent decline in fertility from 6.3 in 1975 (MHPC, 1978:73) to 3.5 in 1995 (BBS, 1996), the fertility rate is still far above the replacement level. The crude birth rate (CBR) has declined from 47 per thousand population in 1975 to 26.9 in 1995. The recent decline in fertility has created much interest among researchers, policy makers and academicians because such dramatic change in fertility has occurred in Bangladesh without a substantial improvement in socioeconomic status, health condition and other factors needed usually for fertility decline. The socioeconomic development carried out since 1970 is in progress but at a very slow rate. Average economic growth reached 4.3 percent per annum during 1980-91 (World Bank, 1993). Declines in infant mortality (from 112 in 1986 to 78 per thousand births in 1995) (Mitra et al., 1994; BBS, 1996) indicate improvements in socioeconomic welfare, increased literacy and continuous rise in educational attainment (BSA, 1993), which in turn has led to an increase in age at first marriage and use of contraception. Some authors argued that the decline in fertility level in Bangladesh was achieved mainly due to a successful family planning programme (Cleland et al., 1994).

The success of the population development programmes has, no doubt, contributed to the fertility decline. In the long run economic development plays a decisive role in fertility reduction, but in the short run it is individual behavior, like age at marriage, practice of breastfeeding, and contraceptive use, which directly affects fertility (Bulatao, 1979).

To improve our understanding of the causes of fertility decline, it is necessary to analyze the mechanisms through which socio-economic variables interact with individual behavior to influence fertility. Bongaarts (1978, 1983) has developed a model to measure the effects of individual behavior patterns on fertility (which he termed proximate determinants of fertility). Proximate determinants of fertility are defined as the biological and behavioral factors through which, and only through which, social, economic and environmental variables affect fertility (Bongaarts and Potter, 1983).

The first systematic classification of the proximate determinants of fertility was made by Davis and Blake (1956). They identified a set of 11 variables which they termed the "intermediate variables of

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fertility". Although their framework has found wide acceptance, it has proved difficult to incorporate into quantitative reproductive models. In the late seventies, Bongaarts (1978) revised Davis and Blake's framework and proposed a new system incorporating only 7 variables which he termed the "proximate determinant of fertility". The 7 variables are as follows:

1. Proportion married among females
2. Contraceptive use and effectiveness
3. Prevalence of induced abortion
4. Duration of postpartum infecundability
5. Fecundability (or frequency of intercourse)
6. Spontaneous intrauterine mortality
7. Prevalence of permanent sterility

Each of these seven intermediate fertility variables directly influences fertility and together they determine the level of fertility. Using data from 41 developed and developing nations, Bongaarts and Potter (1983) observed that 96 percent of the variance in the total fertility rates could be explained by the four principal proximate determinants; namely, marriage, contraception, induced abortion and lactational infecundability. Because of these findings, it seemed reasonable to put our main stress only on the first four variables. To quantify the fertility inhibiting effect of the four major proximate determinants, Bongaarts developed a model which is now widely used in fertility analysis. The model is multiplicative and expresses the actual level of fertility (measured by the total fertility rate, TFR) as the outcome of the fertility reducing effects of the four main proximate determinants on a total fecundity rate (TF):

$$TFR = C_m \times C_c \times C_a \times C_i \times TF \qquad (1)$$

where C_m is the index of marriage, C_c is the index of contraception, C_a is the index of abortion and C_i is the index of lactational infecundability. Each index indicates the extent to which fertility is reduced from maximal levels by the specified proximate determinants. The compliment of each index represents the proportionate reduction in fertility attributable to the determinants. It has been observed that TF is less variant from population to population, lying between 13 and 17 births per woman with a standard value of 15.3 (Bongaarts and Potter, 1983:87).

Objective of the Study

The objective of this study is to examine the levels, trends and determinants of fertility in Bangladesh. The study provides a critical review of the four principal proximate determinants of fertility: marriage, contraception, induced abortion and lactational infecundability. The contribution of each of the proximate determinants in the process of fertility change is then studied through the decomposition of the total fertility rate into their proximate components.

Data Source

The study utilizes data from the 1993-94 Bangladesh Demographic and Health Survey (BDHS). The 1993-94 BDHS employed a nationally representative two-stage sample. The sample was selected from the frame of the Integrated Multipurpose Master Sample (IMPS), newly created by the Bangladesh Bureau of

Statistics on the basis of the 1991 Census data. The survey considers ever-married women of reproductive age as eligible for interview. A sample of 9,681 households were selected from which 9,640 eligible women were successfully interviewed.

The BDHS has two basic questionnaires, i.e., a household questionnaire which recorded information on all household members, and an individual questionnaire which recorded detailed information on eligible women who were identified from the household questionnaire. The individual questionnaire collected information on the respondent's background characteristics, reproductive history, knowledge and practice of family planning, breastfeeding practices, marriage, fertility preferences, as well as husband's background characteristics. Fieldwork began on 17 November 1993 and ended on 12 March 1994.

Results and Discussion

Fertility Levels and Trends

The main source of fertility data collected in the 1993-94 BDHS is the birth history provided by ever-married women aged 10-49. Each woman was asked to provide information on the date of birth, sex of the child, survival status, and age at death. Since one of the major objectives of the BDHS was to document recent fertility levels and trends in Bangladesh, the main report of the survey (Mitra et al., 1994) provides some preliminary results on the topic. In this study we critically examine the results in order to reach conclusions about levels and trends of fertility in Bangladesh.

Although it is ideal to estimate the current fertility rate directly from survey data on the number of births occurring over the twelve month period prior to the survey date, it has been found in Bangladesh and elsewhere that this method usually leads to an underestimate of current fertility level owing to common

Table 1: Age-specific Fertility Rate (ASFR) for All Women and Currently Married Women, Bangladesh, BFS 1989 and BDHS 1993-94

Age Group	BDHS 1993-1994			BFS 1989		
	ASFR	Relative percentage of ASFR	ASMFR	ASFR	Relative percentage of ASFR	ASMFR
15-19	0.140	20.3	0.287	0.182	17.8	0.320
20-24	0.196	28.5	0.232	0.260	25.4	0.314
25-29	0.158	23.0	0.170	0.225	21.9	0.247
30-34	0.105	15.3	0.113	0.169	16.1	0.182
35-39	0.056	8.1	0.062	0.114	11.1	0.127
40-44	0.019	2.8	0.022	0.056	5.5	0.066
45-49	0.014	2.0	0.017	0.018	1.8	0.022
Total	0.689 TFR= 3.44		0.903 TMFR= 4.52	1.024 TFR= 5.12		1.278 TMFR= 6.39

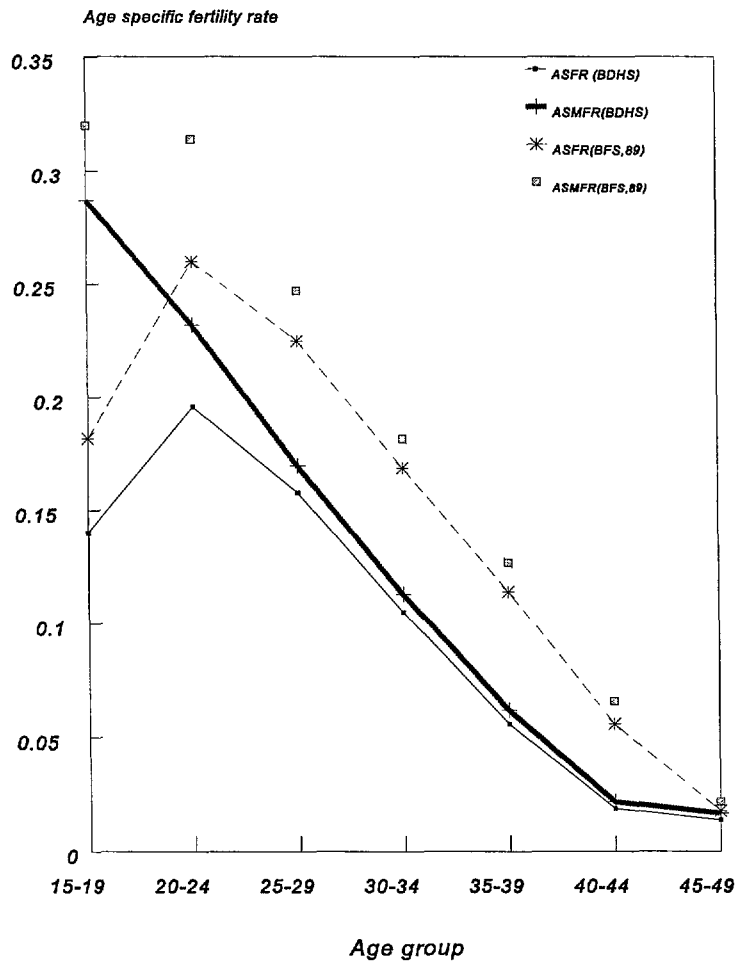
Note: TFR= Total Fertility Rate, TMFR= Total Marital Fertility Rate, ASMFR= Age-specific Marital Fertility Rate

problems of mis-statement of ages or birth dates of children, omission and under-reporting of births (Brass, 1978). In addition, the sampling variance of the rate for short periods can be large (Hannenberg, 1980). To keep the above mentioned problems to a minimum, the current fertility rate has been estimated by averaging reported births over a three year period before the survey date.

Table 1 presents age-specific fertility rates (ASFR) for all women and currently married women for the period three years prior to the 1993-94 BDHS date along with the fertility rates obtained from the 1989 BFS for comparison purposes. The age-specific marital fertility rates (ASMFR) have been derived by dividing the age-specific fertility rates by the proportion of women currently married in each age group.

The age distribution of fertility shows that the age-specific fertility rate (ASFR) was highest for women aged 20-24 and then it started declining. However, the age-specific marital fertility rate (AMFR) is highest among the women aged 15-19. The age pattern of fertility also indicates that Bangladeshi women have children early in their child bearing period. For example, 71.8 percent of the total fertility rate (TFR) was due to women under 30 years of age while it was 20.3 percent due to women under 20 years of age. The corresponding figure for the 1989 BFS was 65.1 and 17.8 percent respectively. This indicates that fertility

Figure 1: Age-Specific Fertility Rate: BDHS 1993-94 and BFS 1989



is shifting towards earlier ages. Figure 1 shows the pattern of shifting more clearly. The shifting is also evident from a fall in the mean age at childbearing from 27.7 years in 1989 to 25.9 years in 1993-94. This suggest that childbearing is taking place relatively earlier now than it was before, presumably because of greater fertility regulation at older ages in recent years.

The total fertility rate (TFR) is estimated to be 3.44 in the 1993-94 BDHS. The corresponding figure in 1989 BFS was observed as 5.12 births per women. It indicates that the fertility has declined by 1.68 births, a drop of 33 percent in half of a decade. This is a huge decline in fertility in Bangladesh over a short period of time.

Table 2: Annual Total Fertility Rates (TFR) from Selected Sources, Bangladesh, 1980-93

Year	BFS 1975	BBS	BFS 1989	BDHS 1993/94	Matlab (Comparison area)
1975	6.3				
1980		5.0	6.8		
1981		5.0	6.7		
1982		5.2	6.4	6.6	6.3
1983		5.1	6.1	6.2	6.1
1984		4.8	5.9	6.6	5.1
1985		4.7	5.5	6.3	6.0
1986		4.7	5.1	6.1	5.5
1987		4.4	4.8	5.6	5.2
1988		4.4		5.2	5.4
1989		4.3		4.9	4.9
1990		4.3		4.4	5.0
1991		4.2		3.8	4.3
1992		4.2		3.4	3.8
1993		3.7[1]		3.3	3.9

Source: BFS (1975); BBS (Cleland et al., 1994: 15 and BBS, 1994: 5); 1989 BFS (Huq and Cleland, 1990: 104); Matlab (ICDDR,B 1994: 3)

[1] The figure is from the BBS Health and Demographic Survey, 1995.

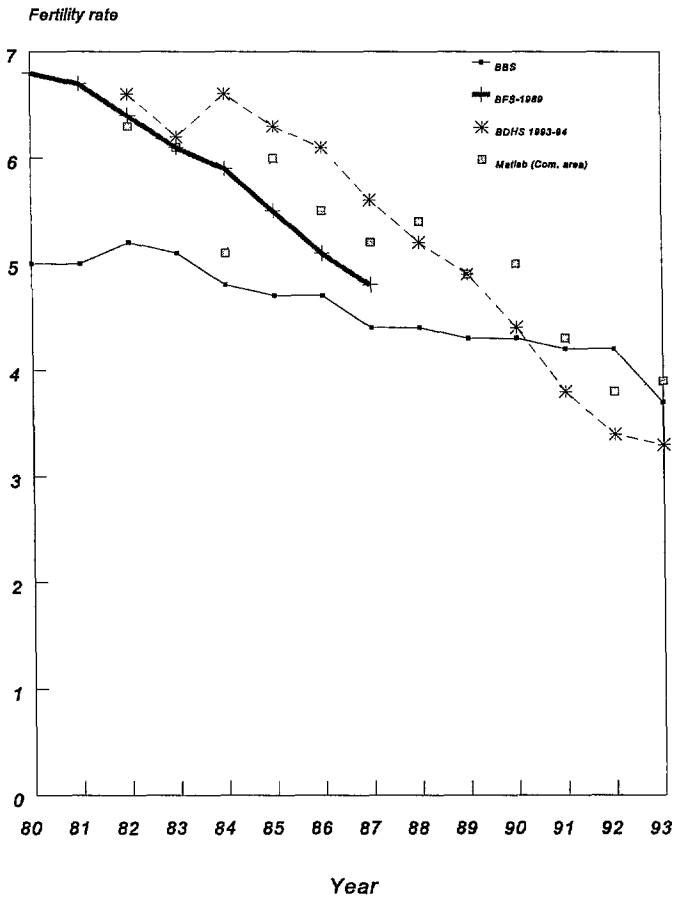
Table 2 presents total fertility rates obtained from various sources. The data, depicted in Figure 2, reflect an extremely steep decline in fertility that occurred in Bangladesh. Fertility has declined from 6.3 births per women in 1975 to 3.4 births for the period 1991-93. This is by far the steepest decline in fertility ever recorded in Bangladesh and one of the most rapid reductions in Asia (Cleland, 1994). This has created a sensation among researchers, policy planners and academicians. Many have also speculated that the level may be seriously under estimated. However, a validation study of the 1993-94 BDHS in Matlab did not find any important inconsistency, specially in the BDHS fertility data (Bairagi et al., 1995).

The estimated fertility in the 1993-94 BDHS is far lower than reported by the Bangladesh Bureau of Statistics' (BBS) sample vital registration system, which itself is thought to underestimate fertility. The BBS reported a TFR of 3.7 births per women in 1993. It may be mentioned here that, despite its

painstaking methodology, the BBS sample registration system probably suffers from undercounting of births (Cleland, 1994).

Although data from Matlab (which is considered very high quality data) may not be nationally representative and therefore may not be comparable to BDHS data, they do provide evidence of very sharp decline in fertility that has taken place in Bangladesh. The data from the BDHS and Matlab comparison area show roughly comparable rates of decline over time, but the decline depicted from the BDHS is steeper than from the Matlab comparison area. In the Matlab comparison area, the TFR was reported to be 3.9 in 1993.

Figure 2: Trends in Total Fertility Rates: Bangladesh, 1980-93



The level of the total fertility rate reported in the BDHS for the years immediately preceding the survey may be underestimated. This could be explained by the general tendency of fertility surveys in Bangladesh to displace births backward, giving an illusion of recent fertility decline (Cleland, 1994; Bairagi et al., 1991). In addition to the displacement problem, Arnold (1990) and Kantner et al. (1995) pointed out that the survey instrument may have encouraged interviewers to underestimate children below three years of age in order to avoid asking the battery of questions on morbidity and mortality.

The application of the Bongaarts model to study the fertility inhibiting effect of the major proximate determinants of fertility yields a TFR of 4.50 for the 1993-94 (Table 14). The low fertility estimates in the

BDHS also do not agree with average international experience relating the contraceptive prevalence rate (CPR) and the TFR. Based on the CPR obtained from the BDHS, Kantner et al. (1995) estimate the TFR for 1993/94 to be 4.2 instead of 3.4. The reason for this disparity is not yet clear.

We now have a broad range of possible estimates for the TFR in 1993-94; from the direct estimate of 3.4 as the lower bound and from indirect estimate of 4.5 as upper bound. The actual level of fertility may lie

Table 3: Change in Birth Spacing Patterns, BDHS 1993-94

	Period at start of interval			
Interval	1974-78	1979-84	1984-88	1989+
Marriage to first birth				
Median	34.09	31.58	28.74	26.20
60 month progression ratio	0.75	0.78	0.85	0.86
Conditional mean (Trimean)	30.82	31.55	28.36	23.73
First to 2nd birth				
Median	29.97	30.64	30.94	32.84
60 month progression ratio	0.90	0.90	0.87	0.85
Conditional mean (Trimean)	31.25	31.19	31.49	32.17
2nd to 3rd birth				
Median	30.00	30.76	32.05	33.44
60 month progression ratio	0.88	0.85	0.82	0.82
Conditional mean (Trimean)	31.15	31.21	31.49	32.52
3rd to 4th birth				
Median	31.03	31.55	33.32	33.63
60 month progression ratio	0.85	0.81	0.78	0.81
Conditional mean (Trimean)	31.19	31.16	31.44	32.12
4th to 5th birth				
Median	32.18	33.31	33.91	34.54
60 month progression ratio	0.79	0.76	0.75	0.79
Conditional mean (Trimean)	31.18	31.28	31.46	32.43
5th to 6th birth				
Median	32.92	34.97	35.10	34.56
60 month progression ratio	0.75	0.72	0.72	0.78
Conditional mean (Trimean)	31.03	31.50	31.34	32.19
6th to 7th birth				
Median	35.10	36.70	37.63	39.36
60 month progression ratio	0.70	0.69	0.68	0.71
Conditional mean (Trimean)	31.07	30.32	31.01	36.09

The trimean (conditional mean) T, as suggested by Tukey (1977), is obtained as $T = (q_1+2q_2+q_3)/4$, where q_i is the ith quartile of the distribution of the birth internal.

somewhere between this range. Pending results from further investigations, we could suggest an estimate of 4.0 births per woman for 1993-94, which is approximately the midpoint of the possible range. To sum up, whatever may be the level of current fertility, it can be said that there is ample evidence that during the last two decades, fertility in Bangladesh has declined 30 percent at least.

To gain further insight into the declining nature of fertility, birth spacing patterns are explored in Table 3 by means of life table technique developed by Rodriguez and Hobcraft (1980). Three types of summary measures are used: the median, the proportion who experienced (I+1)*th* birth within 5 years of *ith* birth; and finally, the conditional mean (trimean) among those who do experience the next birth within 60 months. The conditional mean is a more refined measure of the tempo or speed of reproduction than the median.

It may be seen that first birth interval, i.e. interval between marriage to first birth has been shortened more for the younger cohorts than their older counterparts (Table 3). On the other hand, the proportion of women who have a first child within five years has increased, and among them, the mean length has declined from about 31 months in the mid 1970s to 24 months in the early 1990s. This reflects higher fecundability among the women of recent cohorts as a result of decline in early adolescent marriages and possibly a greater sexual intimacy among the couples in the early months of cohabitation than was previously the case.

The most important finding is that the birth intervals increased consistently over the period 1970-93 (Table 3) irrespective of the parity indicating a declining trend in fertility. This trend is also evident from reduction in the proportion of women who have another birth within five years of a previous birth. The conditional mean, however, remains constant except for the most recent cohorts (1989 and above).

To improve our understanding of the causes of fertility decline, we critically examine the direct determinants of fertility. As most of the variations in fertility can be attributed to the differential impact of marriage, contraception, lactational infecundability and induced abortion (Bongaarts and Potter, 1983), we present a brief overview of these factors in the subsequent sections.

Marriage

Like most Asian societies and Muslim communities, childbearing outside of marriage is very rare in Bangladesh. Thus the age at which women marry, the proportions who remain single and the proportion of women divorced, widowed and separated are all potentially important factors influencing fertility levels.

Current Marital Status

Table 4 shows the age distribution of female population (defacto) of aged 10-49 at various time points by age and current marital status. Among the female population aged 10-49, 32 percent were never married, 63.4 percent were currently married and 4.6 percent are either widowed, divorced or separated in 1993-94. It shows that the overall proportion currently married remained static in the vicinity of 64 percent since 1981. However, a number of changes has occurred in the age distribution of the female population by proportion single and proportion widowed, divorced or separated since 1975. There is an appreciable rise in the proportion never married and a fall in the proportion currently married at the early ages among females indicating a rising trend in age at marriage. The most remarkable rise in the proportion of never married women has occurred in the 15-19 age group. The proportion single drops to less than one percent by age 35, which indicates almost universal marriage among women in Bangladesh. Another important

change since 1975 is a decline in the percentage of women who are widowed, divorced or separated. A decline in adult mortality may be responsible for this trend, but improving chances of remarriage for widows cannot be ruled out. The declining trend in the proportion of marital disruption at higher ages may partially offset the decrease in fertility at younger ages due to rising age at marriage.

Table 4: Age Pattern of Proportion Never Married and Proportion Widowed/Divorced/Separated Reported in Various Censuses and Surveys, Bangladesh, (1975-1994)

Age	1975 BFS	1981 Census	1989 BFS	1991 Census	1993-94 BDHS
Proportion never married					
10-14	91.2	93.0	96.2	96.8	95.2
15-19	29.8	31.3	49.0	48.7	50.5
20-24	4.6	5.1	12.0	10.5	12.5
25-29	1.0	1.3	2.3	2.4	2.2
30-34	0.2	1.0	0.3	1.1	0.3
35-39	0.4	0.4	0.1	0.6	0.3
40-44	0.1	0.7	0.2	0.6	0.7
45-49	0.0	0.3	0.1	0.4	0.2
Total	29.9	27.7	31.0	29.1	32.0
Proportion widowed/divorced/separated					
10-14	0.6	0.0	0.2	0.2	0.2
15-19	5.8	3.3	3.0	1.7	1.8
20-24	5.1	4.0	5.4	2.9	3.0
25-29	6.2	4.3	6.4	3.6	4.9
30-34	9.1	6.1	7.0	5.1	7.0
35-39	15.2	9.6	10.5	7.3	9.7
40-44	21.1	17.4	14.5	12.5	11.8
45-49	29.1	25.2	18.5	17.9	17.4
Total	7.8	5.9	6.0	4.5	4.6
Proportion currently married					
10-14	8.2	7.0	3.5	3.0	4.6
15-19	64.8	65.4	48.1	49.6	47.7
20-24	90.3	90.9	82.8	86.6	84.6
25-29	92.1	94.4	91.4	94.0	92.9
30-34	90.7	92.9	92.7	93.8	97.7
35-39	84.3	89.8	89.7	92.1	90.0
40-44	78.8	81.9	84.1	86.9	87.4
45-49	71.0	74.5	80.3	81.7	82.4
Total	62.3	66.4	63.0	64.4	63.4

Source: 1975 BFS (MHPC, 1978: 49); 1981 and 1991 Census (BBS); 1989 BFS (Huq and Cleland, 1990).

Age at First Marriage

Bangladesh has a long tradition of early marriage among women (Maloney et al., 1981; Aziz and Maloney, 1985) which is still prevailing. The 1993-94 BDHS data (Table 5) suggest that among the 9640 sample of ever married females aged below 50 years, about 95 percent were married when they were below 20 years of age and only 5 percent were married at ages 20 and above. The corresponding figures in the 1989 BFS were 96 and 4 percent respectively (Mahmud, 1994). About three-fourths of the ever married women got married when they were 15 or younger. The average age at first marriage among the ever-married women is very low i.e. 14.5 years which is well below the minimum legal age at marriage for females of 18 years set by the Government of Bangladesh in 1976. The situation is, however, improving slowly but steadily. Over the last 18 years, the mean age at first marriage has increased by little more than 2 years, from 12.3 years in 1975 to 14.5 years in 1993-94. The mean age at first marriage is higher among the young cohort then their older counterparts- indicating a rising trend in age at marriage (Table 5).

Table 5: Percentage Distribution of Ever-Married Women by Age at First Marriage and Current Age

Age at 1st Marriage	Current Age				Total		Cumulative percentage
	<20	20-29	30-39	40-49	N	%	
<=12	18.1	20.2	28.2	36.9	2385	24.7	24.7
13	25.5	19.1	22.4	23.3	2079	21.6	46.3
14	21.3	15.3	15.7	16.3	1583	16.4	62.7
15	15.0	12.3	11.1	9.0	1139	11.8	74.5
16	10.0	9.0	6.9	4.8	756	7.8	82.3
17	6.1	7.5	4.3	3.1	552	5.7	88.0
18	3.0	5.0	3.2	2.1	361	3.8	91.8
19	1.1	4.4	2.6	1.5	284	3.0	94.8
20+	-	7.5	5.7	3.2	500	5.2	100.0
Total	100.0	100.0	100.0	100.0	100.0	-	-
N	1417	4029	2679	1514	9640	-	-
Mean age at marriage	14.0	14.7	14.1	13.3	14.5	-	-

The general tendency of under-reporting the age at first marriage among females in Bangladesh may produce a very low estimate of mean age at first marriage. In this regard, the more reliable indicator of age at marriage is the 'Singulate Mean age at Marriage' (SMAM) as suggested by Hajnal (1953). The SMAM is obtained on the basis of reported current age and current marital status rather than on direct reporting of age at marriage.

Table 6 presents the SMAM observed in Bangladesh at different time points. According to the 1993-94 BDHS, the SMAM for females was 18.2 years while for males it was 25.6 years - suggesting that women marry men who, on average, are seven and a half years older. The SMAM shows a rising trend for both sexes. Since 1975, the female SMAM has increased by 1.9 years: from 16.3 years in 1975 to 18.2 years

in 1993-94. Since 1961, the SMAM for males and females has changed by 11 percent and 31 percent respectively. It also indicates a consistently wide gap between the ages of brides and grooms, averaging 8 years.

Table 6: Singulate Mean Age at Marriage (SMAM) and its Trends

Year	Source	SMAM		Age difference	Change in SMAM (1961=100)	
		Male	Female		Male	Female
1961	Census	22.9	13.9	9.0	100.0	100.0
1974	Census	23.9	15.9	8.0	104.4	114.4
1975	BFS	24.0	16.3	7.7	105.0	117.3
1981	Census	23.9	16.6	7.3	104.4	119.4
1989	BFS	25.5	18.0	7.5	114.4	129.5
1991	Census	25.0	18.1	7.0	109.2	130.2
1993-94	BDHS	25.6	18.2	7.4	111.8	131.0

Table 7: Singulate Mean Age at Marriage (SMAM) by Place of Residence, Region and Education

	SMAM		Wife-Husband Characteristics Age Difference
	Male	Female	
Bangladesh	25.6	18.2	7.4
Place of Residence			
Rural	25.3	17.9	7.4
Urban	26.9	19.5	7.4
Division			
Barisal	26.2	18.4	7.8
Chittagong	27.1	19.1	8.0
Dhaka	25.5	17.9	7.6
Khulna	25.5	17.9	7.6
Rajshahi	24.3	17.7	6.6
Education			
No Schooling	23.9	17.1	6.8
Primary	25.0	17.6	7.4
Secondary/Higher	27.6	19.7	7.9

Table 7 shows that female SMAM is higher in urban areas (19.5 years) than in rural areas (17.9). There are some geographical variations in the SMAM; Chittagong Division shows highest SMAM for both male and female followed by Barisal, Dhaka, Khulna and Rajshahi Divisions. Husband-wife age gaps are also higher in the Chittagong Division and lowest in the Rajshahi Division. The SMAM is appreciably higher among males and females with educational attainment levels of secondary and above (i.e. class VI onward).

Correlates of Age at First Marriage (MCA)

There are a variety of socio-economic and cultural factors that may influence the age at marriage. To examine the differential patterns of age at first marriage by a set of socioeconomic and cultural factors, the well known Multiple Classification Analysis (MCA) was employed (Yates, 1934; Anderson and Bancroft, 1952). Age at marriage of the currently married women was used as the dependent variable and socioeconomic variables were used as explanatory variables. Table 8 presents these results.

Table 8: Mean Age at First Marriage by Selected Socio-economic Characteristics: Multiple Classification Analysis

Explanatory Variables	Number	Unadjusted mean	Adjusted mean for independent variables	Correlation	
				η	β
Current Residence					
Urban	1347	15.55	14.83	.12	.01
Rural	7162	14.60	14.73		
Region of Residence					
Barisal	740	15.03	14.71	.12	.10
Chittagong	1952	15.25	15.24		
Dhaka	2664	14.85	14.75		
Khulna	852	14.39	14.35		
Rajshahi	2301	14.36	14.49		
Respondents Education					
Illiterate	4769	14.27	14.34	.34	.29
Primary	2339	14.62	14.65		
Secondary	1198	16.08	15.82		
Higher	203	19.73	19.19		
Husband Education					
Illiterate	3801	14.28	14.64	.25	.06
Primary	1977	14.48	14.70		
Secondary	1890	15.06	14.81		
Higher	841	16.79	15.23		
Husband Occupation					
Cultivator	3344	14.30	14.64	.15	.04
Labor	2669	14.83	14.82		
Professional	361	16.05	14.44		
Business	1819	15.06	14.86		
Others	316	15.53	15.01		
Religion					
Muslim	7456	14.64	14.67	.10	.07
Others	1053	15.52	15.29		
Member of NGO					
Yes	1624	14.41	14.53	.06	.04
No	6885	14.83	14.80		

Table 8: (Continued)

Explanatory Variables	Number	Unadjusted mean	Adjusted mean for independent variables	Correlation	
				η	β
Socio-economic Status					
Poor class	4921	14.44	14.78	.16	.01
Middle class	2054	14.78	14.70		
Upper class	1534	15.70	14.72		
Women Work Status					
No work	7159	14.76	14.74	.02	.02
Work (no cash)	109	14.14	14.47		
Earn cash	1241	14.74	14.86		
Household Construction					
Katcha	6176	14.46	14.75	.19	.00
Rudimentary	1757	15.19	14.74		
Pucca	576	16.51	14.79		

Grand mean= 14.75; Multiple R square= 0.138; Multiple R= 0.371

Findings indicate that educational attainment of ever married women, compared to the other variables, had the strongest association (η=.34) with age at marriage. The effect of respondents's educational levels also remain high after adjusting for the effect of all other predictors in the model (β=.29). Both the adjusted and unadjusted mean age at marriage for the women who have 11 or more years of education is about 5 years higher than the women who are illiterate (Table 8). As indicated by the unadjusted correlation ratio, the second most important predictor of age at marriage is husband's education (η=.25). The maximum difference in the age at marriage of ever married women for illiterate and higher educated husbands is 2.51 years. This difference is reduced when adjusted for other explanatory measures. Construction (η=.19), socioeconomic status (η=.16), and place of residence (η=.12) appears as the important predictor of age at marriage, these factors becomes insignificant when adjusted for other predictors considered in the model. Region of residence shows a moderate effect on age at marriage (η=.12 and β=.10). Both the adjusted and unadjusted age at marriage is highest in Chittagong Division and adjusted age at marriage is lowest in Khulna Division. Religion also shows moderate effect (η=.10, β=.07) on age at marriage. It is interesting to note that respondent's work status and membership in NGOs participating in women's development activities show the least effect on age at marriage.

Contraception

The family planning programme in Bangladesh is often considered to be an example of an effective programme in a country without a high level of socioecononic development, often considered as a necessary precursor to successful family planning (Koenig et al. 1987; Duza and Nag, 1993). With the help of the concerted efforts of the Government in conjunction with NGOs in the field, the national family planning programme has achieved a remarkable success in a short period of time, attaining a contraceptive prevalence rate (CPR) of 45 percent in 1993-94. Such an achievement demonstrates that family planning can be successful not only in the short run, but can achieve high and sustained levels of contraceptive use in a population with low levels of socioeconomic development. Results from the 1993-94 BDHS show that among the currently married women of age 15-49, knowledge of at least one family planning method

is almost universal. However, only 65.7 percent of women reported ever having used any family planning method (Mitra et al., 1994:40-42). The large gap between knowledge and use of contraception may be attributed to factors such as lack of complete knowledge about the methods that might lead to use, higher desired family size, supply problems, lack of knowledge about supply source, poor quality of services, and religious and cultural characteristics (Bulatao, 1979; Phillips et al., 1984).

According to the 1993-94 BDHS, 44.6 percent of currently married women were using any method of family planning, of which 36.2 percent was due to modern methods and 8.4 percent was due to traditional methods (Table 9). Modern methods account for 81.2 percent of total use while traditional methods claim 18.8 percent of total use (Table 9). Among the modern methods, pill claimed the highest prevalence rate (17.4%), followed by female sterilization (8.1%), injectables (4.5%), condom (3%), IUD (2.2%) and male sterilization (1.1%).

It is disappointing to note that a substantial proportion (8.4%) of all couples still relied on traditional methods. The sizable contribution of traditional methods to overall CPR deserves special attention by family planning programme managers. It is increasingly agreed that the family planning programme cannot afford to depend heavily on traditional methods as these methods are likely to be unreliable and their demographic impact is likely to be low.

Table 9: Percentage of Currently Married Women who are Currently Using Specific Family Planning Methods as Reported in Various Surveys, Bangladesh, 1975-1994

Methods (u_1)	BFS 1975	CPS 1981	CPS 1983	CPS 1985	CPS 1989	BFS 1989	CPS 1991	BDHS 1993/94
Modern (Total)	5.0	11.0	13.8	18.4	24.4	23.2	31.2	36.2
Pill	2.7	3.5	3.3	5.1	9.1	9.6	13.9	17.4
IUD	0.5	0.4	1.0	1.4	1.7	1.4	1.8	2.2
Injectable	-	0.4	0.2	0.5	1.1	0.6	2.6	4.5
Condom	0.7	1.6	1.5	1.8	1.9	1.8	2.5	3.0
Vaginal	0.0	0.3	0.3	0.2	0.2	0.1	0.0	0.0
Female Sterilization	0.6	4.0	6.2	7.9	9.0	8.5	9.1	8.1
Male Sterilization	0.5	0.8	1.2	1.5	1.5	1.2	1.2	1.1
Traditional (Total)	2.7	7.6	5.3	6.9	7.0	7.6	8.7	8.4
Periodic abstinence	0.9	3.9	2.4	3.8	3.8	4.0	4.7	4.8
Withdrawal	0.5	1.8	1.3	0.9	1.2	1.8	2.0	2.5
Other	1.3	1.9	1.8	2.2	2.0	1.8	2.0	1.1
Any Method (CPR)	7.7	18.6	19.1	25.3	31.4	30.8	39.9	44.6

*Suggested by Bongaarts and Potter (1983)

Table 9 shows that the CPR rose from 7.7 percent in 1975 to 44.6 percent in 1993-94. Overall, the CPR increased by approximately 2 percentage points annually. If the present programme effort and current performance level can be sustained, the current use of contraceptives will be increased substantially and it could reach 60 percent by the turn of the century. Recently released results from the 1994 Bangladesh

Health and Demographic Survey conducted by the Bangladesh Bureau of Statistics (BBS) claim further increases in CPR (46.3 percent in 1994) (BBS, 1996).

Estimation of Contraceptive Use-Effectiveness

Contraceptive effectiveness is the extent to which the practice of contraception lowers fecundability, which is defied as the monthly probability that sexually active, fecund, non-contracepting women will conceive (Bongaarts and Potter, 1983). The quantitative measurement of contraceptive effectiveness thus requires the comparison of the pregnancy rates of contraceptors and non-contraceptors in the same population. The standard measure of contraceptive effectiveness (e_i) equals the proportional reduction in the monthly probability of conception due to use of a particular contraceptive method among fecundable women (Potter, 1960; Tietze, 1959). Algebraically,

$$e_i = 1 - \frac{f_i}{f_n},$$

where:

f_i is the residual fecundability i.e. monthly probability of becoming pregnant while using a contraceptive method which is called monthly failure rate, and

f_n is the natural fecundability i.e. "expected" monthly probability of becoming pregnant while unperfected.

Thus from the knowledge of the contraceptive failure rate among users and the failure rate while unprotected, we can estimate contraceptive use effectiveness from the above formula. However, we lack an estimate of f_n in this study. However, the study of Bairagi and others (1996) demonstrated that the annual rate of conception that leads to a live birth during non-use was about 45 percent in Matlab. Laing (1978) also observed a similar rate of annual conception while unprotected in the case of the Philippines.

Thus assuming a value of annual expected probability of becoming pregnant while unprotected of 45 percent, we obtained estimates of contraceptive effectiveness (e_i) for different contraceptive methods corresponding to the estimate of annual failure rates as observed in the 1993-94 BDHS and in Matlab. The annual failure rates of different contraceptive methods in Matlab have been taken from a recent study by Bairagi and others (1996). Estimates of these method specific use-effectiveness levels are presented in Table 10.

Findings in Table 10 show that among the acceptors in Matlab as well as in Bangladesh, injectables and IUDs are the most effective methods, followed by pills. Condoms are the least effective method in Matlab, while at the national level taditional methods are least effective.

From method specific use-effectiveness estimates it is possible to derive the average use-effectiveness, e, which is estimated as the weighted average of the method specific use-effectiveness levels, e_i, with the weights equal to the proportion of women using a given method (u_i) i.e.,

$$e = \frac{\Sigma\, e_i u_i}{\Sigma\, u_i}.$$

Table 10: Estimation of the Use-effectiveness of Contraceptive Methods in Matlab and in Bangladesh, BDHS 1993-94

Methods	BDHS		Matlab		Percent (I) using method (u_i)
	Annual failure rate (f_i)	Use effectiveness (e_i)	Annual failure rate (f_i)	Use effectiveness (e_i)	
Pill	1.7	0.96	11.6	0.74	17.4
IUD	0.3	0.99	3.7	0.92	2.2
Injectable	1.1	0.98	0.6	0.99	4.5
Condom	5.9	0.87	19.2	0.57	3.0
Sterilization	0.0	1.00	0.0	1.00	9.2
Periodic abstinence	8.6	0.81	13.5	0.70	4.8
Withdrawal	8.6	0.81	13.5	0.70	2.5
Others	16.5	0.63	13.5	0.70	1.1
Average use effectiveness (e):		0.93		0.81	

* Average use-effectiveness, $e = \sum (u_i e_i) / \sum u_i$

Results in Table 10 provide two extreme values of average use-effectiveness in Bangladesh: 94 per cent in the BDHS and 81 percent in Matlab. The BDHS provides an implausibly high estimate of use-effectiveness. On the other hand, the Matlab data provide a low estimate of use-effectiveness. It should be noted here that use-effectiveness measures stem primarily from estimates of use-failure. Use-failure rates in the BDHS correspond to the lower bound of international experience (derived mainly from developed societies), while the use-failure rates observed in Matlab correspond to the upper bound - a pattern more typified by developing countries (Ross and Frankenberg, 1993). Thus the use-effectiveness that has been observed in Matlab is probably closer to the true value of use-effectiveness in Bangladesh. In the subsequent analysis we will utilize these rates for estimating the fertility inhibiting effect of contraception.

Breastfeeding and Post-Partum Amenorrhoea

Breastfeeding is important not only for child health and survival but is also an important determinant of fertility. It is now well established that breastfeeding prolongs the period of post-partum amenorrhea: an infecundable period following a birth or a late term abortion, during which women are usually unable to become pregnant due to suspension of the normal cycle of anovulation and menstruation.

The length of the post-partum amenorrhea period varies widely among populations. The principal behavioral factor affecting this length is the duration and intensity of breastfeeding. Without breastfeeding the average amenorrhea interval is short - usually 1.5 months (Leridon, 1977). With increasing duration of breastfeeding, the duration of amenorrhea increases to some extent, but not at a constant rate. Thus breastfeeding patterns in a society have important effects on its fertility level.

Like other duration variables, estimation of breastfeeding duration from retrospective histories is a difficult task. Breastfeeding duration may be estimated from the last closed birth interval or from the open birth interval. In this study we confined our analysis to the current status data of breastfeeding and amenorrhoea. A typical life table approach has been followed allowing the inclusion of periods of observations of censored as well as non-censored cases. The breastfeeding status of mothers whose children subsequently died and who are still continuing breastfeeding on or before the survey date was considered as censored in life table analysis. The same procedure has been adopted in estimating the amenorrheic period.

Information on breastfeeding in the BDHS 1993-94 was collected for all children born during the last three years preceding the survey date. A total of 3,926 women provided information, of whom 149 (3.8 percent) were reported to have never breastfed their last born child (Table 11). This indicates the universality of breastfeeding in Bangladesh. Although universal breastfeeding is a long tradition in Bangladesh, only 8.6 percent of all last born children are given their first breast milk (i.e. colostrum - containing rich antibodies to protect child health) within one hour of birth and less than half (48 percent) of children are put to the breast within the first day of life. Breastfeeding was initiated by 43.4 percent of babies after one day of birth. This indicates an apparent widespread late initiation of breastfeeding in Bangladesh, a situation that merits special attention by the health policy planner.

Table 11 also presents the current breastfeeding status by child's age in months. Current breastfeeding status has been categorized into three categories: `no' breastfeeding, 'full' breastfeeding- defined as receiving breast milk only plus receiving breast milk and plain water only, and 'partial' breastfeeding- defined as regular supplementation to the babies diet in addition to breastfeeding. The results indicate that among newborns aged 0-5 months, 55 percent were fully breastfeed and 44 percent were partially breastfed. Full breastfeeding drooped to 24.7 percent and 13.9 percent respectively for those aged 6-11 months and 12-17 months. About 82 percent of the babies aged 12-17 months were partially breastfed. The average duration of full breastfeeding is very short; i.e., about 3 months. Almost 95 percent of the children under age six months were reported to have been breastfed at least six times in the 24 hours preceding the survey.

Table 11: Summary of Initial Breastfeeding, Timing of Supplementary Foods and Median Duration of Different Types of Breastfeeding and Frequency of Breastfeeding

			Child's age (in month)		
Initial Breastfeeding Status	%	Breastfeeding Status	0-5	6-11	12-17
Never brestfeed	3.8	Not brestfeeding	1.0	2.1	4.6
Within 1 hour	8.6	Full brestfeeding	55.1	24.7	13.9
Within 1 hour to 1 day	48.0	Partial brestfeeding	43.9	73.2	81.5
After one day	43.4				
Brestfeed 6+ times in 24 hours	91.9				
Median duration of exclusive brestfeeding					1.6
Median duration of full brestfeeding (including plain water)					2.7
Median duration of any brestfeeding					30.04
Median duration of post-partum amenorrhoea					12.11

According to the 1993-94 BDHS, the average duration of breastfeeding in Bangladesh is 30.0 months (Table 11). Our estimate of overall duration of breastfeeding is very close to the estimate of 28.0 months obtained by Mitra et al. (1994) from the same set of data through the prevalence/incidence method. Various studies during the last two decades have reported average duration of breastfeeding in Bangladesh in the vicinity of two and half years. The variation in the estimates partly comes from the type of data used and partly from the methodologies applied.

The average duration of post-partum amenorrhea was estimated to be 12.1 months for the country as a whole (Table 11). This estimate is slightly higher than obtained by Mitra et al. (1994) through the prevalence/incidence method (11.5 months). Although the duration of breastfeeding did not change much over the last two decades, the length of amenorrhea shows a declining trend. The 1975 BFS reported a mean post-partum amenorrhea of 14.6 months (Singh and Ferry, 1984). In another study, Ford and Kim (1987) found that the median amenorrheic period in Bangladesh (Matlab) was 14.7 months during 1975-79. In a recent study, Salway et al. (1993) examined changes in post-partum amenorrhea over the 1978-1990 period utilizing longitudinal data from rural Matlab. They observed that the median duration of post-partum amenorrhea fluctuated around 13 months for the cohorts of births from the 1978-1983 period. Thereafter, a sharp decline occurred, with the duration falling from 13.5 months for 1982-1983 cohort to 9.4 months for the 1988-1989 cohort. Salway et al. also observed that the increased use of contraception is one of the important factors for the declining trend in post-partum amenorrhea in Bangladesh.

Induced Abortion

Induced abortion is still illegal in Bangladesh except in a few special circumstances, such as pregnancy due to rape or threats to a mother's life. Owing to legal constraints as well as social sensitivity, there is no reliable information on abortion through any national level survey. However, evidence from hospital and clinic records and other sources suggests that abortion is not rare in Bangladesh (Khan et al., 1986). Obaidullah et al.(1981) observed that a minimum of 15 percent of total pregnancies were terminated by induced abortion during the years 1978-80, although they suspected that their estimate may be under reported due to legal problems, ethical unacceptability and cultural constraints.

In Bangladesh, the government's health and family planning program promotes Menstrual Regulation (MR) services as a birth control method. In recent years, several government and non-government clinics have been providing MR services. Records of these clinics suggest a rising trend in MR in Bangladesh. Thus it can be argued that the prevalence of induced abortion in Bangladesh may not be negligible and increased medical facilities and modernization may enhance it. Therefore, appropriate efforts should be made to assess the true effect of this factor.

The 1993-94 BDHS does not provide any useful estimate of the induced abortion rate. Only 51 women (0.5 percent) were reported to have had an induced abortion during their life time. However, data from the Demographic Surveillance System (DSS) in the Matlab comparison area, which is roughly comparable to typical regions of rural Bangladesh, may be utilized to provide a rough estimate of the induced abortion rate for Bangladesh. In a recent study, Ahmed et al. (1996) observed that during the period 1982-91 there

were 1,183 induced abortions among 22,500 women of reproductive age over a 9-year period in the Matlab comparison area. This gives an estimate of 'total induced abortion rate' (TA) as,

$$TA = \frac{1183}{9 \times 22500} \times 30 \cong 0.18$$

where 30 years is the total exposure period over a women's reproductive life-span. However, due to likely under reporting, this estimate should be taken as a lower bound of the TA in Bangladesh.

Fertility Inhibiting Effects of the Proximate Determinants

To estimate the fertility inhibiting effects of the four important proximate determinants: marriage, contraception, induced abortion and lactational infecundability, we applied the Bongaarts' proximate determinant model given by the equation 1. The summary measures which are needed for the application of the model are presented in the first panel of Table 12.

Table 12: Estimates of Selected Reproductive Measures and Derived Indices of Proximate Determinants

A. Reproductive Measures	BFS 1975	BFS 1989	BDHS 1993/94	% change during 1989-94
TFR (observed)	6.33	5.12	3.44	
TMFR	7.42	6.39	4.52	
Proportion of contraceptive use (u)	0.08	0.31	0.45	
Contraceptive use effectiveness (e*)	0.76	0.82	0.81	
Mean duration of post-partum amenorrhea (I)	14.60	11.52	12.11	
Total Abortion Rate (TA)	-	0.18	0.18	
B. Model Indices				
C_m	0.850	0.801	0.761	-10.5
C_c	0.937	0.727	0.610	-34.9
C_i	0.604	0.666	0.653	+8.1
C_a	1.000	0.982	0.971	-2.9
Combined effect of four indices ($C_m \times C_c \times C_i \times C_a$)	0.481	0.381	0.294	-38.9
TF	15.3	15.3	15.3	
TFR (Estimated)	7.33	5.83	4.50	

* The average use-effectiveness adopted here from Matlab study (Bairagi et al., 1996)

The second panel of Table 12 presents the estimated values of the indices of the four principal proximate determinants of fertility. The complement of each index represents the proportionate reduction in fertility attributable to each fertility determinant. The lower the index value the greater is the fertility reducing impact. The index C_m represents the proportion by which TFR is smaller than TMFR as a result of marital pattern. Similarly, the index C_c gives the proportion by which TMFR is smaller than TN (Total natural fertility), given the effectiveness of contraceptive use, and the index C_i indicates by how much TN is smaller than TF (total fecundity) due to the effect of lactational infecundability.

Results indicate that in 1993-94, contraception had the highest fertility reducing effect, accounting for 39.0 percent (C_c=0.610) reduction of TN relative to TMFR. Lactational infecundability is the second most important fertility reducing factor, reducing the total fecundity rate (TF) by 34.7 percent (C_i=0.653). The marriage pattern had the lowest fertility reducing effect, reducing actual fertility levels below TF by 23.9 percent (C_m=0.761) (Table 12).

In an attempt to document changes among the indices over a period of one and half decade (1975-1993/94) the results at different time points are compared in Table 12. Findings suggest that during the period (1975-1993/94) only an appreciable amount of change occurred in the contraceptive use variable. During the period 1975-1994, the index of marriage declined by 10.5 percent and the index of contraception declined by 34.9 percent, but the index of lactational infecundability increased by 8.1 percent. Thus the decline in the total fertility rate (from 6.33 to 3.44) between 1975 and 1994 is caused primarily by the reducing effect of contraception. The reducing effect of marriage pattern is offset by a reduction in duration of lactational infecundability. The combined fertility limiting effect of the four proximate determinants (C_m X C_c X C_i X C_a) was 0.481 in 1975 and 0.294 in 1994, indicating a decline of about 38.9 percent in fertility during the period 1975-94.

Table 13: Magnitude of the Total Inhibiting Effect Being Accounted for by Each Proximate Fertility Determinants: Bangladesh, 1989-1993/94

	Fertility inhibiting effect			
	Birth per woman		Percent	
Proximate determinants (indices)	1989	1994	1989	1994
Marriage (C_m)	2.18	2.41	23.0	22.3
Contraception (C_c)	3.13	4.36	33.1	40.4
Lactational infecundability (C_i)	3.98	3.76	42.0	34.8
Induced abortion (C_a)	0.18	0.26	1.9	2.4
Total: [15.3-TFR(estimated)]	9.47	10.80	100.0	100.0

The total fertility inhibiting effect is prorated by the logarithm of each index e.g. effect of marriage: [TF-TFR(estimated)] X log C_m/(logC_m+logC_c+logC_i).

Table 13 shows the magnitude of the total inhibiting effect of each proximate fertility determinant at two points of time, 1989 and 1994. The difference between the total fecundity (TF), assumed to be 15.3, and the estimated TFR is attributed to the result of the inhibitory effect of each determinant. The total

inhibiting effect is prorated by the proportion of the logarithm of each index to the sum of logarithm of all indices (Wang et al.,1987). The results indicate that of a total of 9.47 births in 1989 being inhibited, 2.18 births (or 23.0 percent) are due to the effect of marriage variable, 3.13 births (or 33.1 percent) are due to contraception , 3.98 births (or 42.0 percent) are due to lactational infecundability and 0.18 births (or 1.9 percent) are due to induced abortion. Similarly in 1994, the three proximate variables (marriage, contraception, lactational infecundability and induced abortion) inhibited 10.80 births, distributed as 2.41 births (or 22.3 percent), 4.36 births (or 40.4 percent), 3.76 births (or 34.8 percent) and 0.24 births (or 2.4 percent) respectively.

From the foregoing analysis it is noted that in the recent years contraception has emerged as the highest fertility reducing factor in Bangladesh. Until recently, lactational infecundability was considered to be the most important and highest fertility reducing factor in Bangladesh, but by 1994 contraception had become the most important determinant of fertility. The increasing effect of contraception is evident from the declining trend in the values of the index C_c from 0.937 in 1975 to 0.610 in 1994. On the other hand, the fertility reducing effect of lactational infecundability is gradually decreasing due to a declining trend in the lactational amenorrheic period (Salway et al., 1992).

Although there is an increasing trend in the impact of the marriage component, reflecting the effect of increased age at marriage, the rate of change is very slow. The prevailing cultural and social norm in Bangladesh is unlikely to permit a change in the proportion non-married beyond a certain limit and the prospect for an immediate rise in age at marriage for females does not seem to be very bright. It is to be noted that the joint effect of marriage and lactational infecundability did not change much over the period 1975 to 1994 as the declining effect of lactational infecundability has been offset by the increasing effect of marriage. This leads to the conclusion that the future reductions in fertility in Bangladesh may be largely dependent on increased use (and use-effectiveness) of contraception.

Decomposition of the change in TFR: 1989-1993

To quantify the contribution made by each of the proximate determinants of fertility to an observed change in fertility between two points in times (in this analysis 1989 to 1994), Bongaarts' (1978) model can again be employed. The details of the decomposition technique may be found elsewhere (Bongaarts and Potter, 1983: 106-108).

The decomposition of the change in TFR between 1989 and 1994 is presented in Table 14. It indicates that TFR declined during this period by 32.81 percent (or in absolute terms 1.68 births per woman) from 5.12 in 1989 to 3.44 births in 1994. This total decrease in TFR is found to come from a 5.00 percent (or 0.26 birth per woman) decline due to marriage pattern, a 16.10 percent (or 0.82 births per woman) decline due to an increase in contraceptive use, a 1.95 percent (or 0.10 births per woman) decrease due to lactational infecundability and a 1.12 percent (or 0.06 birth per women) decline due to induced abortion. The change in TFR due to change in other proximate determinants is in no way negligible, contributing 12.93 percent (or 0.66 births per women) to the decline in fertility.

In the second column of Table 14, the decomposition results are standardized to add to 100 percent. It is evident that contraception played the main role (49.1 percent) in the reduction of fertility during the period 1989-1994.

Table 14: Decomposition of the Change in TFR between 1989 and 1994

Factor responsible for change in fertility	Percent change in TFR	Distribution of percent change in TFR	Absolute change in TFR
Proportion of women married	-5.00	-15.24	-0.26
Contraceptive practice	-16.10	-49.07	-0.82
Lactational infecundability	-1.95	-5.94	-0.10
Proportion of induced abortion	-1.12	-3.41	-0.06
Other proximate determinants	-12.93	-39.41	-0.66
Interaction	+4.29	+13.07	+0.22
Total	-32.81	100.00	-1.68

On Fitting of the Bongaarts Model

The application of the Bongaarts model to Bangladesh data shows that the model estimated TFRs are consistently higher than observed TFRs. For example, the model estimated TFR was 4.50 births per women in 1993-94. The corresponding observed TFR was 3.44 births per women. This indicates that either the model overestimates the TFR by more than one birth (or 30 percent) or the BDHS underestimated the TFR in 1993-94. One implication of such discrepancy may be that the four proximate determinants: marriage, contraception, lactational infecundability and abortion explain only a limited extent of the fertility reduction in Bangladesh.

Studies in many other Asian countries such as India, Nepal, Pakistan and China also reported large discrepancies between observed and model estimated fertility rates (Arora and Kumar,1987; Thapa, 1987; Sathar 1984; Wang et al.,1987). The question then naturally arises: what are the possible explanations for the discrepancy between observed and estimated TFRs? Here, the question of error in the data and hence the measurement of indices in the Bongaarts model cannot be ruled out.

It is beyond doubt that there can be measurement errors due to poor quality data, which may partly explain the discrepancies. However, the whole variation cannot be attributed to measurement error alone. In this context a few points are in order. Though WFS data are generally acknowledged to be of reasonably high quality, using data from 29 WFS countries, Singh et al.(1985) observed considerable disagreement between observed and model estimated fertility and argued that the whole unexplained fertility variation cannot be assigned to measurement errors alone. They further demonstrated that there are some other variables that are not included in the application of the model that may be responsible for the large discrepancy. Rindfuss et al. (1987) listed three main possible explanations for the discrepancy; namely, errors in specification of the model, poor measurement of the four principal proximate determinants, and the exclusion of additional proximate variables. In Bangladesh, the discrepancy may be caused by errors in the observed TFR or errors in the measurement of the indices of the proximate determinants. For example, due to lack of information on induced abortion we have had to employ a rough notional value of the total induced abortion rate (TA=0.18) from Matlab experience (which is also thought to be underestimated) and thus the actual fertility inhibiting effect of this variable remains speculative.

The low average value of fecundability of Bangladeshi women, which ultimately affects the TF value, may also largely be responsible for the large discrepancies between the observed and the model estimated TFRs. Utilizing data from the BFS 1989, Islam (1991) has observed a low average value of fecundability in Bangladesh, which is only 0.065 as opposed to very high levels of fecundability observed in Western population, which ranges from 0.10 to 0.25. Owing to this fact, the value of TF may be lower than 15.3 in the case of Bangladesh. Empirical studies, largely based on historical populations of Western Europe characterized by high fecundability, have shown that the normal range of TF varies from 13 to 17 births. In his model, Bongaarts has computed an average TF value of 15.3 based largely on the experience of western populations. A low average value of TF is found in societies that are characterized by poverty, under-nourishment, ill health, frequent spousal separation, and sexual taboos. Bangladesh is a very poor country and possesses all the characteristics of below average TF. It is therefore likely that in Bangladesh TF is lower than 15.3. In India, Arora and Kumar (1987) have argued for an estimate of TF as low as 12. In another neighboring country, Nepal, Thapa (1987) has suggested a TF value of 13.3. Assuming that the value of TF is 13 in Bangladesh, the model yields an estimate of TFR of 3.82, which considerably reduces the discrepancy between observed TFR and model estimated TFR.

Summary and Policy Implications

This study reveals that the 1993-94 BDHS recorded a dramatic fall in the level of fertility in recent years. Fertility has declined from 6.3 births per women in 1975 to 3.4 births in 1993-94, that is, fertility has been virtually halved over the past two decades. This is by far the steepest decline in fertility ever recorded in Bangladesh. There is speculation among demographers, policy planners and academicians that the current fertility estimate in the 1993-94 BDHS may be under estimated due to under-reporting and displacing dates of births backward, which is a general tendency observed in most of the fertility surveys in Bangladesh (Brass, 1978; Cleland, 1994; Bairagi et al. 1991). The limitations of indirect techniques are however well documented. A validation study of the 1993-94 BDHS with the help of BDHS type survey data in Matlab did not find any important inconsistency, especially in the BDHS fertility data (Bairagi et al., 1995). However, it seems apparent that during the last two decades fertility in Bangladesh has declined at least 30 percent.

Declining trends in fertility are also evident from analysis of birth spacing patterns which indicate that there are reductions in the proportion of women who have another birth within five years of a previous birth (Table 4). Another important finding of the study is the change in age specific fertility patterns which indicate that child bearing is now taking place at an earlier age (Table 1 and Figure 1). As the desired level of fertility is declining and age at marriage is rising, couples tend to reach their desired number of children in a quick succession immediately after marriage and then regulate fertility at older ages.

A review of marriage variables shows that there is an appreciable rise in the proportion never married and fall in the proportion currently married at early ages among females, indicating a rising trend in age at marriage. The rising trend in the proportion single continues up to age group 25-29. Another important change since 1975 is a decline in the percentage of women who are widowed, divorced or separated. The proportions widowed, divorced or separated are consistently lower at all age groups in

1993-94 than in all previous surveys or censuses. This factor may offset the decrease in fertility at younger ages due to an increase in age at marriage. The singulate mean age at marriage is increasing slowly but steadily. In 1993/94, it reached 25.6 years for males and 18.2 years for females, indicating a gap of 7.4 years between husbands and wives (Table 6). Among the socioeconomic variables, respondents' education, husbands' education and occupation, region of residence and religion appeared as the most significant determinants of age at marriage (Table 8).

Although prolonged (30 months) and universal breastfeeding is common in Bangladesh, only one-fourth of the lactating women continue full (including plain water) breastfeeding after 5 months. The average duration of exclusive breastfeeding was observed for only 1.5 months. Very few women (8.6%) initiate breastfeeding (colostrum) within the first hour of life. Although the duration of breastfeeding did not change much over the last two decades, the length of amenorrhoea shows a declining trend. This may be due to increased modernization, involvement of women in wage employment, and increased use of supplementation in breastfeeding.

Due to legal and social constraints, national level data on induced abortion are not available and its effect remains unmeasurable. Evidence from hospital and clinic records and other sources suggests that induced abortion is not rare, and is a factor in accounting for fertility levels as well as in fertility reduction. Of the remaining three proximate determinants (marriage, contraception and lactational infecundability), contraception plays the prominent role as a fertility reducing factor. Lactational infecundability is the second most important factor and change in marriage age plays the least role in the reduction of fertility. Our analysis suggests that the fertility reducing effect of contraception is gradually increasing, whereas, the effect of lactational infecundability remains nearly constant.

The fertility reducing effect of the marriage variable is increasing but at a very slow rate. In fact, the fertility inhibiting effect of marriage and lactational infecundability are compensating each other, and during the period 1975-1994 their joint effect remains almost constant (i.e., $C_m \times C_i = 0.50$). The effect of these two variables can not be raised much due to prevailing socioeconomic and cultural reasons. Thus the use of contraception will be the dominant factor of further reduction in fertility.

Though socioeconomic development is desirable to enhance the status of women, it does not seem to be a pre-condition of fertility decline in Bangladesh. The demographic transition unfolding in Bangladesh suggests that women will readily accept contraception if services are made available in a culturally appropriate manner. More importantly, program managers, administrators and policy makers should work to provide a method mix that meets the varied needs of clients as well as being financially and programmatically feasible. Research in developing countries has confirmed that providing clients with a variety of appropriate contraceptive options and quality services can help couples achieve their desired level of fertility, improve contraceptive prevalence and accelerate fertility decline.

There is evidence to suggest that rural poor women, given some income generating opportunities and/or vocational training, feel the need for controlling their family size (Kabir et al 1987). These results suggest the view that involvement of women in productive activities will not only help to improve their economic condition but will also motivate them to control their family size through newly acquired knowledge. Policy implications that can be drawn from this study in order to achieve further fertility decline are : (I) campaigning for further increase in age at marriage of women, especially in rural areas,

(ii) encouraging efforts to increase the quantity and the quality of contraceptive use to induce higher use effectiveness that will lead to greater contribution to fertility decline, (iii) providing a method mix that meets the varied needs of the couples, (iv) ensuring commitment of additional resources to maintain current program momentum, and (v) providing more information to women about the cost and benefits of longer duration of breastfeeding, including encouraging full and intensive breastfeeding.

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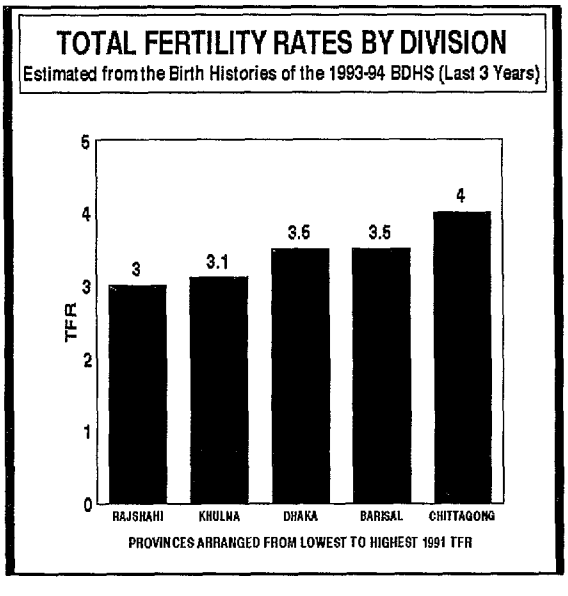
Regional Patterns of Fertility in Bangladesh: Evidence for the 1993/94 Bangladesh Demographic and Health Survey

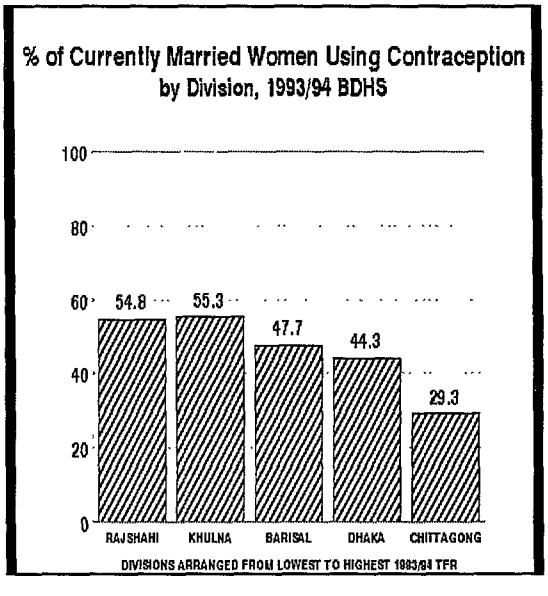
Andrew Kantner, Radheshyam Bairagi

Introduction

The 1993/94 Bangladesh Demographic and Health Survey found that fertility is higher in Chittagong, Dhaka, and Barisal than in Khulna and Rajshahi. Levels of contraceptive use are higher in Khulna and Rajshai than in other divisions. If family planning use is the principal factor determining regional patterns of fertility in Bangladesh, then fertility rates should be lower in divisions with higher levels of family planning performance.

In Bangladesh, levels of contraceptive use and fertility do appear to be reasonably consistent. This is not true in some neighboring Asian countries (e.g., India and Indonesia). As can be seen in the following two charts, levels of fertility and family planning use by division appear to be closely correlated; divisions with lower fertility rates have higher levels of contraceptive use. While fertility





and contraceptive use show clear correspondence in Bangladesh, other factors are also important to consider when attempting to account for regional fertility levels in Bangladesh. This analysis will attempt to provide a fuller accounting of regional TFR patterns by undertaking a synthetic cohort analysis of the demographic, programmatic, and behavioral determinants of fertility.

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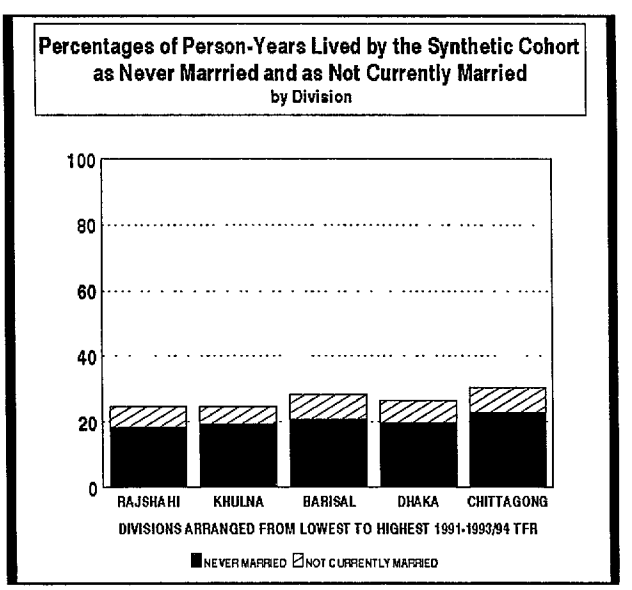
Synthetic Cohort Measures of Contraceptive Prevalence

In an analysis of provincial fertility patterns in Indonesia, Suyono and Palmore (1995) developed a novel procedure for summarizing the determinants of fertility in demographic and health surveys. Their "exposure" analysis attempted to explain why total fertility rates (TFRs) and contraceptive prevalence rates (CPRs) are not highly correlated across provinces in Indonesia. A subsequent analysis of regional fertility in the Philippines utilized the same methodology (Go, et al. 1995).

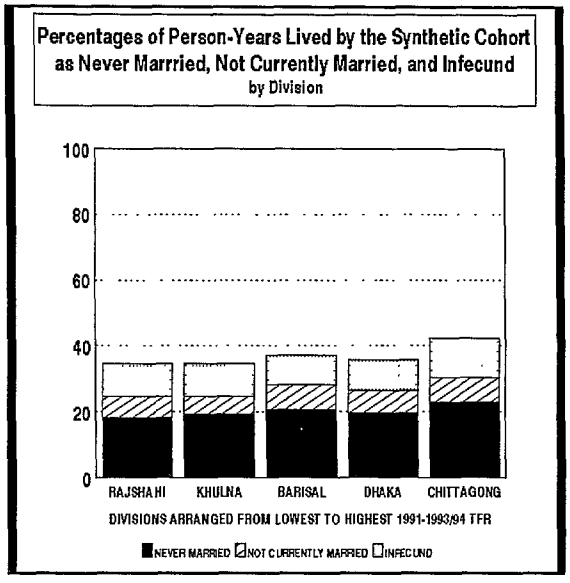
This decomposition approach first deals with the fact that the TFR and CPR are different types of indicators. The TFR is an age-standardized measure and is a "true" rate in the sense that the numerator is a demographic event (births) and the denominator is a measure of women exposed to the risk of experiencing that event. The TFR also has a useful interpretation - it summarizes the fertility experience for a synthetic or hypothetical cohort of women. More precisely, it shows the total number of live births a woman would have if she were subject to a fixed set of age-specific fertility rates and lived throughout the 15-49 age range. On the other hand, the CPR is not age-standardized and does not have a synthetic cohort interpretation. However, Suyono and Palmore were able to calculate age-standardized CPRs (computed in the same manner as a TFR) that measure the number of person-years lived by a synthetic cohort in the state of "currently using contraception". This synthetic cohort definition of contraceptive use is directly comparable to a standard TFR.



Other determinants of fertility can be computed in much the same fashion as an age-standardized CPR. In this analysis of regional fertility levels in Bangladesh, a "synthetic cohort" is constructed from the 1993/94 BDHS that classifies women by their exposure and non-exposure to the risk of having children. It is possible to estimate the total percentage of time that women spend in various "exposed" or "non-exposed" states (e.g., as never married, infecund, and using contraception) if they all lived through their reproductive periods (ages 15-49) and are subject to a given (and unchanging) set of exposed and non-exposed states. This decomposition allows for the identification of demographic, programmatic, and behavioral factors that determine regional patterns of fertility in Bangladesh.

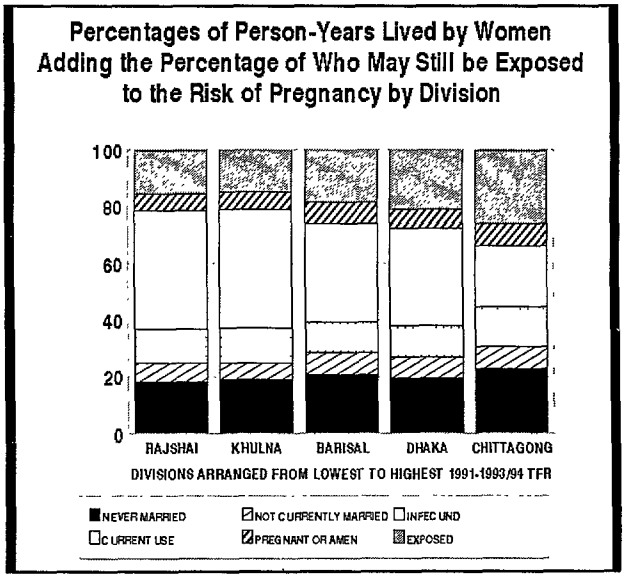
Synthetic Chort Measures of the Proximate Determinants

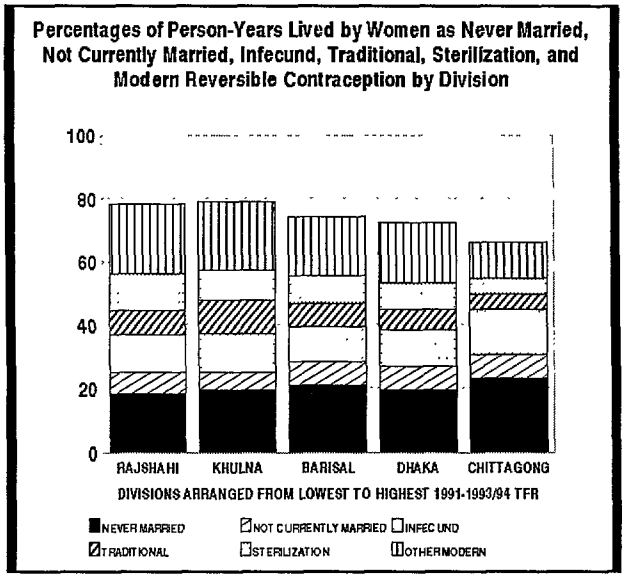
Contraceptive use is only one of the proximate determinants of fertility. An additional important factor is marital status; namely, (1) the amount of time spent being never married (before being married the first time) during the reproductive years and (2) the amount of time spent as not currently married (divorced, widowed, or separated) during the reproductive years.



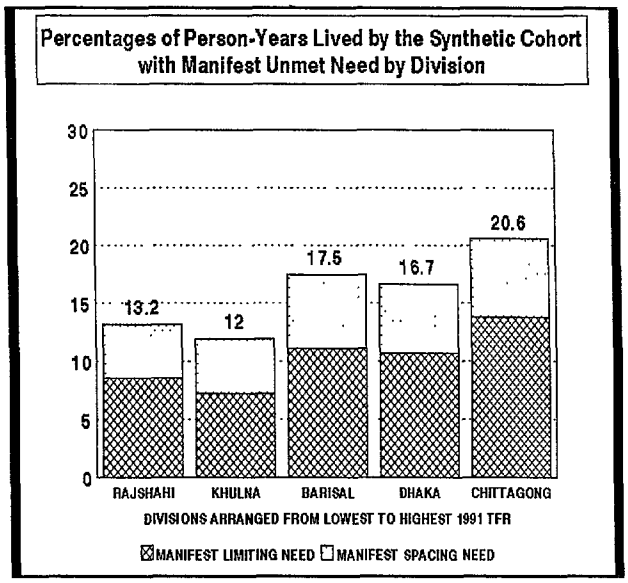
The first decomposition chart shows the percentage of person-years lived by women as never-married and not currently married. These nuptiality measures indicate that fewer women are exposed to the risk of childbearing in Chittagong. The percentage of person-years lived as never married in Chittagong is 23.0 percent, compared to 20.9 percent in Barisal, 19.6 percent in Dhaka, 19.3 percent in Khulna, and 18.2 percent in Rajshahi (see Table 1). The percentage of person-years lived as not currently married is somewhat higher in Barisal, Chittagong, and Dhaka Divisions than in Khulna and Rajshahi. Therefore, based upon marital status alone, Chittagong should have lower fertility than other divisions in the county.

Next, for each division, the percentage of person-years lived by women as infecund is added. Infecund women are defined as (1) being married, (2) not using contraception, and (3) not having a live birth - all for the last five years. Infecundity is similar in all divisions, with Chittagong having slightly higher levels than other regions (the percentage of person-years lived as infecund being 14.3 percent). Therefore, after accounting for infecundity, Chittagong should still have lower fertility than other divisions.





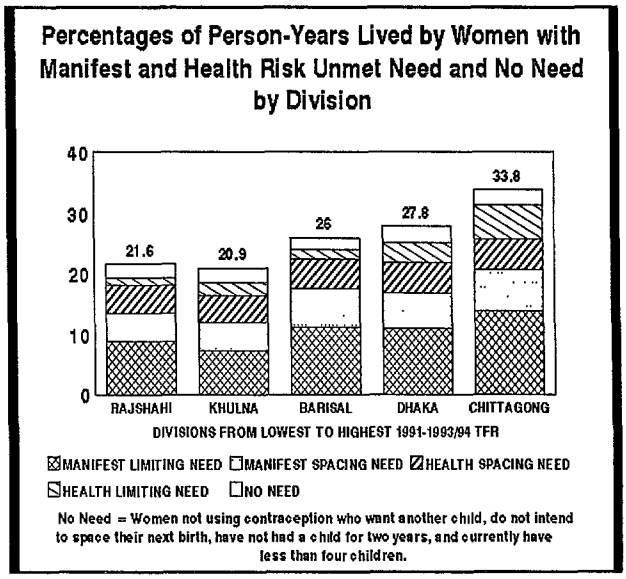
The percentage of person-years lived by women using traditional methods, sterilization, and modern temporary methods is shown in the opposite chart. Traditional method use and sterilization are reasonably uniform across the country (Khulna has somewhat higher use of traditional methods and sterilization is slightly higher in Rajshahi). However, after adding modern temporary methods, the percentage of women exposed to the risk of pregnancy is higher in Chittagong than in other divisions. Thus, modern temporary methods (when measured as the



Women who are still exposed to the risk of pregnancy can be classified into three groups:

(1) Women with manifest need for family planning; (2) Women with health risk need for family planning; (3) Women who do not have a need for family planning.

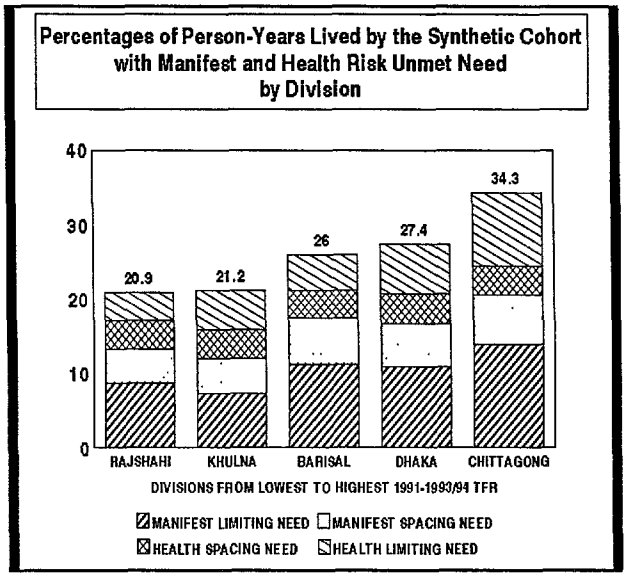
Manifest need for family planning is defined as the percentage of person-years spent by women not using contraception and who: (1) Do not want anymore children (limiting need), or (2) Intend to space their next birth (spacing need).



percentage of person-years lived using pills, IUDs, injectabes, and condoms) account for much of the regional variation in fertility in Bangladesh.

Unmet Need for Family Planning

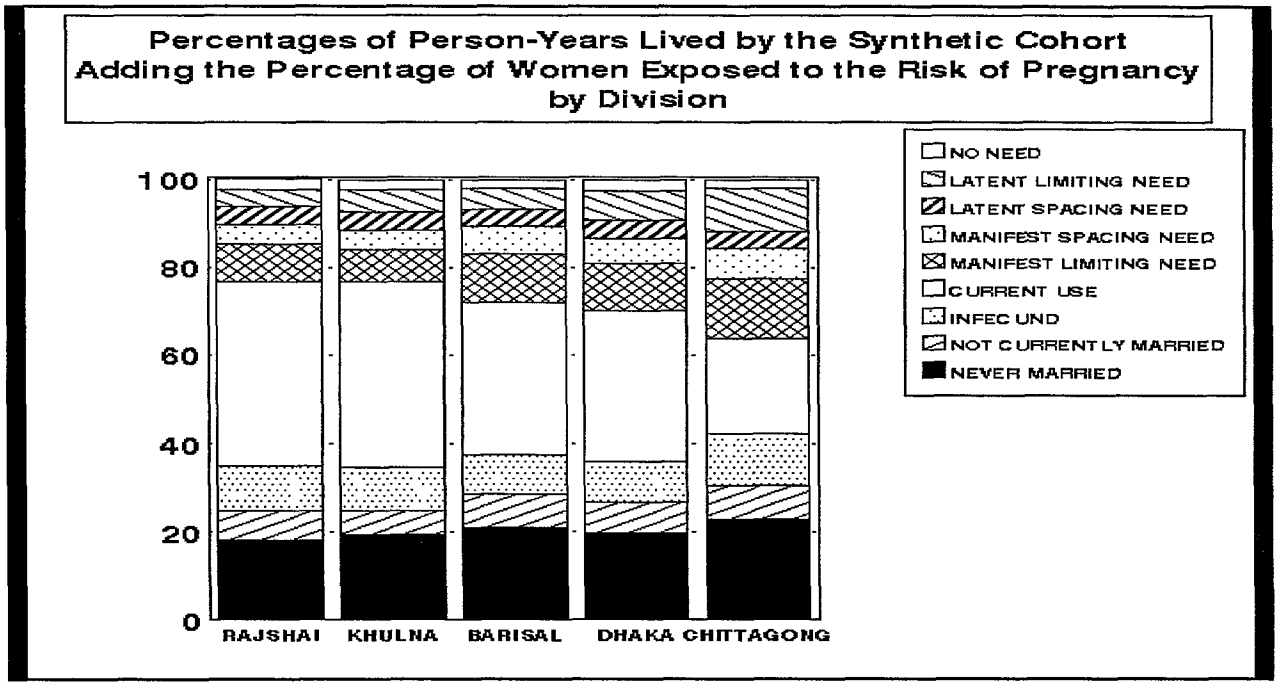
What concerns the national family planning program is the women who are still exposed to the need for contraception. These are women who are currently married, fecund, and not using contraception (including women who are pregnant or amenorrheic).

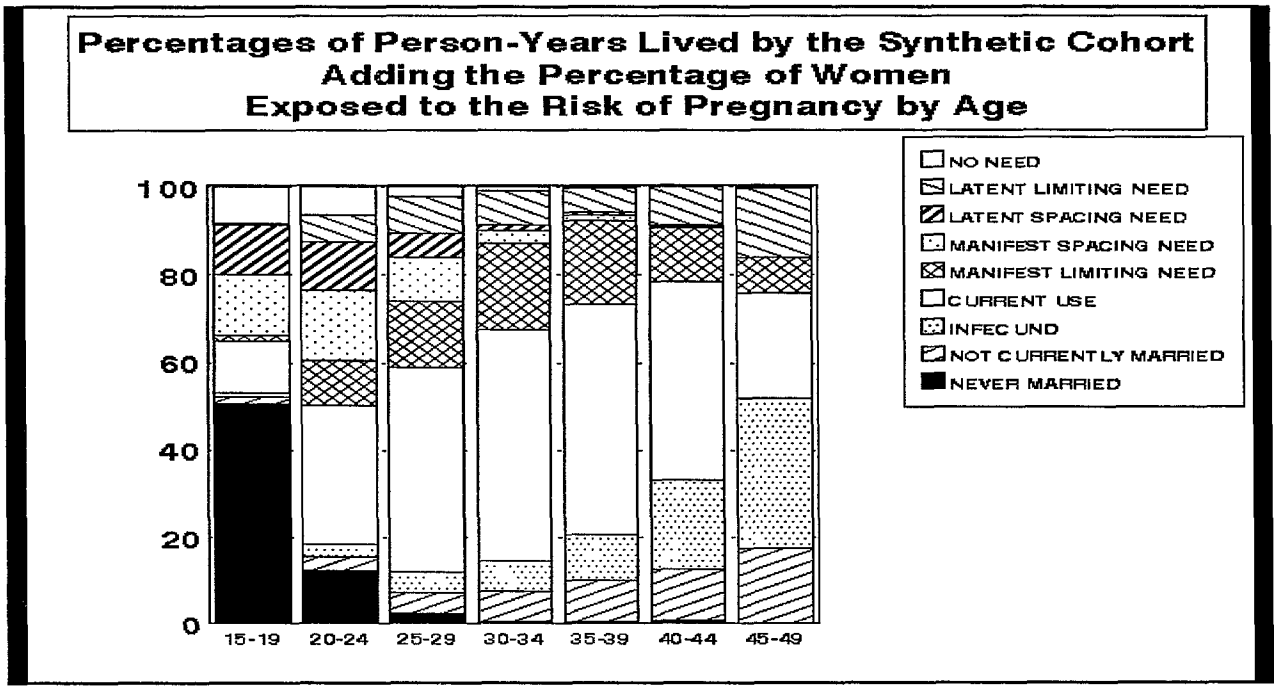


Manifest limiting and spacing need is generally higher in Chittagong than in other divisions. The Bangladesh family planning program needs to address the reproductive health needs of women with manifest need by providing quality services to women with either spacing or limiting needs.

Some women in the 1993/94 BDHS are exposed to the risk of pregnancy and do not realize that they have a need for family planning. These are women who: (1) Already have at least 4 children (a health risk limiting need), and (2) Women who want to have their children closer than two years apart (a health risk spacing need).

Health risk spacing need is roughly similar across all divisions while health risk limiting need is substantially higher in Chittagong. Women with health risk need should receive better counseling and be encouraged to consider adopting family planning methods consistent with their reproductive health needs.



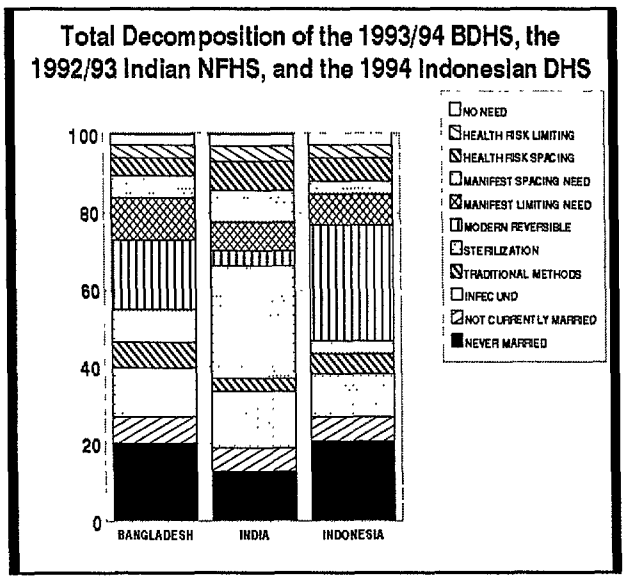


There are also a small number of women with no current need for family planning services. These are women who want more children, who are having low parity births (1-3), have not had a child for at least two years and do not intend to space their next birth.

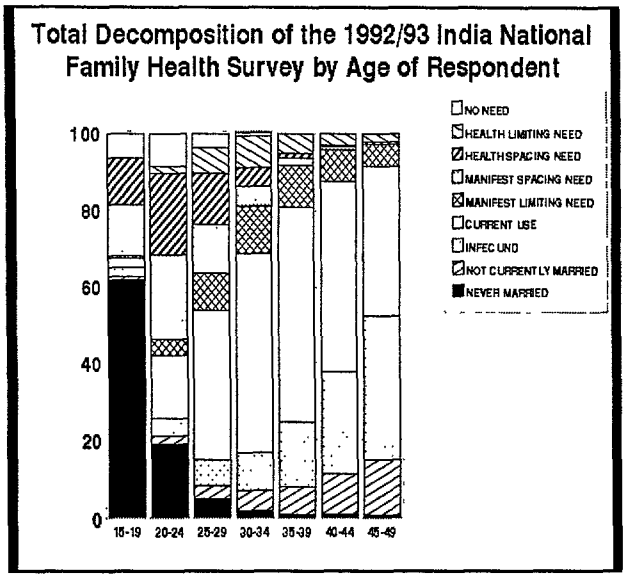
All of the exposed and non-exposed states that have been shown are mutually exclusive and exhaustive. Therefore, the percentage of person-years lived for all women adds to 100%. The following two charts present the total decomposition of the 1993/94 BDHS by region and by age.

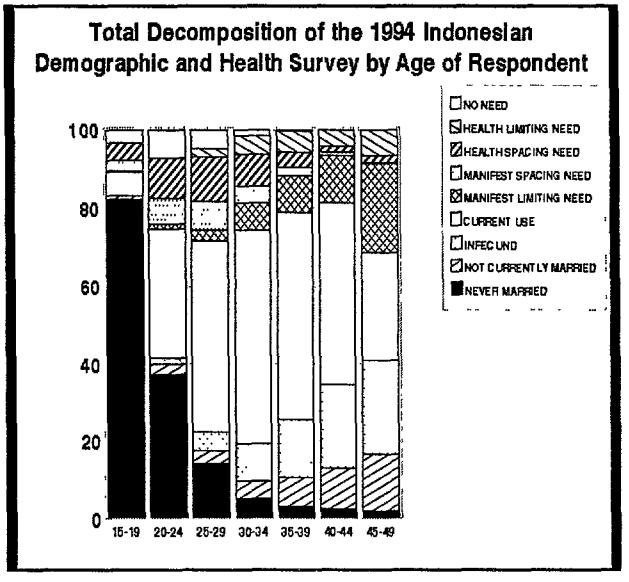
The total decomposition of the 1993/94 BDHS indicates that the use of contraception (more precisely the use of modern temporary methods) largely accounts for regional differences in fertility. Limiting need is generally greater than spacing need throughout Bangladesh. Among all women in the 1993/94 BDHS limiting need is 14.1 percent (10.8 percent manifest and 3.2 percent heath risk). The greatest limiting need is in Chittagong, the Division with the highest level of fertility. Spacing need is still abundant as well. The 1993/94 reports that 10.5 percent of all women have spacing need (5.7 percent manifest and 4.8 percent health risk).

When decomposing the 1993/94 BDHS by age, it is clear that unmet need for spacing is considerably higher among young adults aged 15-24 than among older women. Among adolescent women aged 15-19, 25.3 percent have unmet need for spacing (13.6 percent manifest and 11.7 percent health risk) and among women aged 20-24, 30.0 percent have unmet need for spacing (16.1 percent manifest and 14.0 percent health risk). Limiting need is concentrated primarily among women aged 30-39 and therefore constitutes the age range most in need of permanent and semi-permanent methods of contraception. (Table 2 presents national age decomposition estimates for Bangladesh; division-level age breakdowns are not presented owing to small numbers of cases for certain indicators).



Comparisons of Bangladesh with India and Indonesia (a country generally acknowledged to have a very successful family planning program) clearly demonstrate major differences in the current structure of these country populations. The fertility inhibiting effect of nuptiality (the percentage never married and not currently married) is considerably higher in Bangladesh and Indonesia than in India. Infecundity levels (as defined in DHS surveys) are somewhat greater in India than in Bangladesh and Indonesia. The Indian family planning program is essentially driven by sterilization, with the use of modern reversible contraception being very low. Owing to the relatively low use of sterilization in Bangladesh and Indonesia, limiting need in both countries is higher than in India. However, spacing need (both manifest and health risk) is much greater in India since the use of modern reversible contraception is so low when compared to Bangladesh and Indonesia. It is interesting to note that the Bangladesh decomposition profile is actually more similar to Indonesia





than India. This would not have been the case twenty years ago.

Decomposing the Bangladesh, Indian and Indonesian populations by age shows that contraceptive use among young adults (aged 15-24) is much higher in Bangladesh and Indonesia than in India. As a result, spacing need among young adults in India is well above levels reported in Bangladesh and Indonesia. However, limiting need among older women is higher in Bangladesh and Indonesia.

An additional comparative feature worth noting is that infecundity is considerably higher in India than in Bangladesh and Indonesia. Unfortunately, infecundity as measured in DHS surveys could be measuring actual sterility, abortion, or under reporting of fertility. With data currently available, it is not possible to distinguish these components. However, the low level of infecundity reported by younger Bangladeshi women is not suggestive of a high abortion population. Infecundity among older women is more likely to be actual sterility, although abortion and under reporting of fertility could still be inflating infecundity measures at these ages.

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Table 1: Decomposition of the 1993/94 Bangladesh Demographic and Health Survey by Division: Percentage of Person-Years Lived by Women Exposed to the Risk of Pregnancy by Region

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	National
Never Married	20.92	23.03	19.61	19.33	18.21	20.22
Not Currently Married	7.47	7.58	7.18	5.56	6.60	6.99
Infecund	10.96	14.25	11.45	12.28	12.03	12.51
Traditional Methods	7.26	4.53	6.45	10.59	7.50	6.73
Sterilization	8.90	5.31	8.29	9.49	11.84	8.53
Modern Temporary Methods	18.54	11.57	19.30	21.81	22.25	18.1
Limiting Manifest Need	11.25	13.90	10.97	7.29	8.86	10.81
Spacing Manifest Need	6.25	6.83	5.88	4.68	4.69	5.72
Health Risk Spacing Need	4.92	5.09	4.86	4.50	4.58	4.80
Health Risk Limiting Need	1.52	5.56	3.44	2.14	1.23	3.22
No Need	2.00	2.36	2.59	2.33	2.20	2.37
Total	100.00	100.00	100.00	100.00	100.00	100.00
TFR	3.47	3.95	3.45	3.05	3.03	3.44

Table 2: Decomposition of the 1993/94 Bangladesh Demographic and Health Survey by Division: Percentage of Person-Years Lived by Women Exposed to the Risk of Pregnancy by Age, National

	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Never Married	50.47	12.43	2.18	.26	.25	.73	.25
Not Currently Married	1.82	2.94	4.95	7.07	9.78	11.84	17.33
Infecund	.87	3.06	4.86	7.56	11.84	24.93	46.93
Traditional Methods	2.43	4.74	6.59	10.31	10.64	12.01	6.56
Sterilization	.11	2.04	6.91	13.50	17.79	16.27	11.61
Modern Temp Methods	9.26	25.04	33.53	29.23	24.22	17.09	5.94
Manifest Limiting Need	1.36	10.09	15.10	19.52	19.12	12.58	8.75
Manifest Spacing Need	13.62	16.09	9.90	2.99	1.32	0.44	-
Health Risk Spacing	11.73	13.96	8.11	2.28	0.56	0.03	-
Heath Risk Limiting	0.04	2.43	5.40	6.71	4.47	4.07	2.64
No Need	8.92	7.18	2.47	.58	-	-	-

Infant and Child Mortality in Bangladesh

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Introduction

This paper uses data from the 1993-94 Bangladesh Demographic and Health Survey to examine child mortality in Bangladesh. The main purpose of the analysis, part of the Secondary Analysis Project of the BDHS program, is to examine child mortality differentials and trends in the light of fertility and mortality intervention programs. The intent is to use the BDHS data both to identify the effects on child mortality of past programs, and to identify areas where new programs could be particularly effective.

The first section reviews broad trends in infant and child mortality in Bangladesh, as indicated by the BDHS and other sources, and certain characteristics of childhood mortality in Bangladesh, such as the age pattern and the differentials by sex of the child. The second section examines differentials in mortality by a wide variety of socio-economic indicators. The third section attempts to identify the factors primarily associated with mortality differentials through the development of a regression model of child mortality risks.

Trends in Childhood Mortality in Bangladesh

Numerous surveys conducted since Bangladesh became independent have collected data from which childhood mortality can be estimated. The data can be classified into three main types: records of births and deaths from a sample vital registration system, retrospective reports of mothers about each one of their births and the survival thereof (individual birth histories), and retrospective reports of aggregate numbers of lifetime births and deaths of those births (aggregate birth histories). The analysis here is based on individual and aggregate birth histories: no use will be made of data from the sample vital registration system.

Estimates of child mortality are subject to various types of reporting error that will affect the validity of the estimates. Individual birth histories may be affected by omission of births and deaths (greater proportional omission of deaths than births will bias estimates downwards) and, generally less seriously, by misreporting of dates of birth and ages of death. Errors may vary by length of time ago of the events and by characteristics of the mother, such as her education, and of the child, such as its sex. Aggregate birth histories may also suffer from omission of births and deaths, and estimates based on such aggregate histories may be distorted by misreporting of the variable used as a proxy for exposure to risk of the children, usually age or duration of marriage of the mother. Aggregate birth histories do not require reporting of individual dates, however, so the estimates are not affected by such errors.

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The 1993/94 BDHS was the third birth history survey to be conducted in Bangladesh. The first Bangladesh Fertility Survey (BFS-1) was conducted in 1975, and the second (BFS-2) in 1989. They used broadly similar questionnaire structures to the BDHS, though the BDHS collected a great deal more information about each child than the BFS's. A large number of aggregate birth history surveys have been conducted, starting with the 1974 Bangladesh Retrospective Survey of Fertility and Mortality, continuing with a series of Contraceptive Prevalence Surveys (1979, 1981, 1983, 1985, and 1989) and including most recently the Bangladesh Health and Demographic Survey in 1994. Birth history surveys generally provide estimates of child mortality for periods up to 15 years before the survey date, while the standard analysis of aggregate birth histories provides estimates of child mortality indicators covering about 12 years before the survey.

Figure 1 compares estimates of child mortality in Bangladesh from various sources over time. Part A shows estimates of the Infant Mortality Rate (IMR), the probability of dying by age 1, while part B shows estimates of the Under-5 Mortality Rate (U5MR), the probability of dying by age five. In both cases, a trend has been fitted to the observations using a weighted least squares methodology.

In Figure 1A, there is reasonable agreement between the IMR estimates from different sources of data, although the indirect estimates based on reports of younger women, particularly 15-19, are generally sharply higher than other estimates for similar time periods (such points often overestimate average child mortality levels because of selection bias, and get zero weight in the trend fitting process). The IMR appears to have fluctuated narrowly in the region of 150 per 1,000 live births into the mid 1970s, and then to have started to decline reasonably steadily to the early 1990s, by which time the IMR had fallen to about 80 per 1,000. No data sets stand out as being much above or much below the general pattern, though the first BFS produces rather low estimates for the late 1960s and early 1970s, while the 1994 HDS produces rather low estimates for the late 1980s. The estimates from the BDHS are in reasonably good agreement with the other sources, except perhaps for the estimate for the period 10-14 years before the survey, which appears a bit low.

Figure 1B shows reasonable agreement between estimates of U5MR from different sources. As before, the indirect estimates based on reports of the youngest mother, 15-19 and 20-24, are well above the general pattern. The BFS-1 estimates are a bit below the general trend, and interestingly the BFS-2 estimates of U5MR are also a bit below the indirect estimates (whereas the IMR estimates had been rather high -- this suggests an atypical age pattern of child mortality from the BFS-2). The BFS-2 and BDHS sequences join up almost perfectly, but the 1994 HDS estimates are still below most other indicators. Overall, the data suggest that the U5MR fluctuated in the range 230 to 250 per 1,000 live births from the late 1950s through the mid 1970s, perhaps falling slowly in the early 1960s and rising slightly in the late 1960s and early 1970s, before starting a sustained decline to around 120 per 1,000 in the early 1990s.

The exact pattern of child mortality change in Bangladesh cannot be established with certainty from the available data, but there can be no doubt that a sustained decline began in the mid or late 1970s, dropping the IMR and U5MR by the early 1990s to about half their levels in the early 1970s. Such a decline over a 20 year period indicates an average decline of about 3 percent per annum, a respectable rate of decline by developing country standards, but by no means unprecedented.

Mortality Patterns by Age

The pattern of mortality by age tends to vary with the overall level of mortality in standard ways. These patterns have been investigated in the development of model life table systems such as those of Coale-Demeny and the United Nations. Data from the BDHS are used to compute mortality risks for time periods and age ranges, and the age patterns of these risks can then be compared with standard patterns. Two comparisons are made: of the ratio of neonatal mortality (the probability of dying in the first four weeks of life per 1,000 live births) to infant mortality by level of infant mortality, compared to a standard based on the experience of the United States in the 20th century; and the probability of dying between the ages of one and five to the infant mortality rate compared to a set of standards developed by Coale and Demeny.

Figure 2A shows the ratio of neonatal to infant mortality for the periods 0-4, 5-9 and 10-14 years before the BDHS, together with the standard pattern based on data from the U.S. The patterns are completely different. While the standard shows neonatal mortality rising as a proportion of infant mortality as IMR falls, the BDHS data show the opposite pattern. Part of the explanation for the Bangladesh pattern may be the declining importance of neonatal tetanus as a cause of death in infancy. Even in the period 0-4 years before the BDHS, however, the proportion of infant deaths occurring in the first month of life is still above the level seen in the U.S. at comparable levels of infant mortality.

Figure 2B plots the probability of dying between the ages of 1 and 5 against the infant mortality rate for the three five year periods before the BDHS, together with the standard patterns summarized by the Coale-Demeny model life tables from the "North", "South", "East" and "West" families of models. The BDHS points fall between the "North" and "West" patterns, indicating a distribution of deaths by age consistent with the historical experience of countries which now have low mortality. The "East" pattern tends to be associated with short breastfeeding, whereas the "North" pattern tends to be associated with long breastfeeding, so the pattern observed for Bangladesh is consistent with what would be expected.

Mortality Patterns by Sex

Hill and Upchurch identified standard ratios of female to male mortality in childhood for populations with low gender preference at specified levels of overall male childhood mortality. For the 10 years prior to the BDHS, the ratio of female to male infant mortality is 0.87, compared to a standard ratio (for the observed male U5MR) of 0.81. Thus in infancy, girls suffered lower mortality than boys in Bangladesh, but not as much lower as expected in the Hill/Upchurch standard. Of the 38 DHS surveys studied by Hill and Upchurch, 18 had a larger excess in infancy than Bangladesh. Between the ages of 1 and 5, however, the story is quite different. The ratio of the female to male probability of dying between the ages of 1 and 5 in Bangladesh in the 10 years before the BDHS was 1.33, whereas the Hill/Upchurch standard for the same level of male U5MR is 0.92. Only two of the 38 DHS surveys studied by Hill and Upchurch (Pakistan and Egypt 1988) have a larger difference between the observed and expected ratios. Not surprisingly, female to male ratios for U5MR are also unfavorable, the observed ratio being 1.01, compared to an expected ratio of 0.85; only seven of the 38 surveys studied had larger differences. Thus in infancy, mortality of girls is only modestly higher, given the mortality of boys, than would be expected in a low discrimination population, but between the ages

of 1 and 5 it is much higher, and as a result ends up substantially higher overall under the age of five. It is not clear what factors account for this change from relatively low to very high effects of discrimination.

Socioeconomic Differentials in Child Mortality

Neonatal, infant and under 5 mortality rates have been calculated for the periods 1985-89 and 1990-94 for a wide variety of social and behavioral characteristics. Results are shown in Table 1. Of particular interest are the rates of change from 1985-89 to 1990-94. For the country as a whole, the NNMR fell by 30 percent over this period, while the IMR and U5MR each fell by 27 percent.

Place of Residence

Dhaka division has the highest U5MR, followed by Chittagong, Rajshahi, and Barisal, while Khulna has the lowest, in both periods. Barisal has the highest rate of decline, while Rajshahi and Dhaka decline least. Neonatal mortality varies little by division, whereas both Khulna and Barisal have substantially lower IMR than the other three divisions by the early 1990s. All the divisions show substantial declines in all three measures, the smallest decrease being 19 percent, the highest 36 percent. Child mortality has fallen throughout Bangladesh at a surprisingly even pace.

Mortality is clearly lower in urban non-slum households than in urban slum or rural households. Urban non-slum areas show the fastest rates of decline, and rural areas show the slowest declines with the exception of the neonatal age range, with the result that residents of urban slums, from having the highest child mortality risks in 1985-89, have lower risks than rural families in 1990-94. It should be noted that this classification is by residence at the time of the survey, and that the estimates for urban slum mortality are based on only some 650 children in total.

Education

Mortality risks vary sharply by education of parents. Roughly speaking, the risk of a child dying in any one of the three age categories is about twice as high if the mother has no education than if the mother has secondary education, with primary education in between. The U5MR fell by similar proportions, around 25 percent, for each educational category, but in the neonatal period decline was fastest among the children of women with no education. Father's education has been categorized slightly differently, into none or low primary, high primary (4 to 6 years) , and secondary. Differentials are somewhat less pronounced for father's education; in particular, the benefit of secondary education over high primary is quite modest. Declines from 1985-89 to 1990-94 are very similar for all categories, averaging about 27 percent for U5MR. To put the educational differences in context, it should be noted that the risk of dying before age five in the period 1990-94 for the children of women with secondary education is still about seven times the average risk of children in the U.S.

Father's Occupation

The children of unskilled laborers have the highest mortality risks in each age range and each period, and also have the lowest rates of improvement. Mortality is lowest among the children of professional

workers, those involved in trade, and semi-skilled laborers (who surprisingly have the fastest rates of improvement). The children of fathers working in agriculture fall in between, both in level and in rate of improvement.

Reproductive Dynamics

In all age ranges and both periods first births have the highest mortality risks and second to fourth births have the lowest. However, mortality risks decline by very similar amounts from 1985-89 to 1990-94 for each birth order group.

Mortality risks are also by and large highest for short (< 24 months) preceding birth intervals and lowest for long (48+ months) intervals. The differences are also large, typically births after a short interval having three times the risk of a birth after a long interval. Mortality decline may also have been somewhat faster among the longer interval births than among the shorter interval births. In the first year of life there is not much difference between the risks of children born three and four or more years after the previous birth, but the U5MR is substantially lower for the latter category. It is interesting to note that the mortality advantage of a longer preceding interval is as great after the child's first birthday as before it, suggesting that maternal depletion resulting from a short interval is not the main factor responsible for the birth interval effect.

Children born to women under the age of 20 have higher mortality risks than those born to women aged 20 or over, and children born to women aged 35 and over in general have higher mortality risks than those born to women aged 20-34. The differences by mother's age are not very large, though mortality decline was uniformly fastest for the women aged 20-34.

Usual Source of Drinking Water

Children living in households getting their drinking water from a piped source (either inside or outside the compound) have much lower mortality risks than children getting their water from tubewells or other sources, though the risks for families getting their water from tubewells are very similar to the risks for families getting their water from other sources. Source of water refers to the situation at the time of the survey, so trends cannot be interpreted rigorously, but mortality decline in each age range is lowest for households getting their drinking water from a tubewell.

Access to Health Services

It is difficult to measure access to health services adequately. Distance has been used as a proxy for access in Table 1, categorizing households by their distance from a Family Welfare Center (less than 1 mile, 1-3 miles, 4+ miles) and from a hospital (less than 5 miles, 5 or more miles). The access variable is a current status variable, so comparison is for the 1990-94 period. Mortality risks rise monotonically as access declines except for the final category with the poorest access. Mortality decline also appears to be fastest for the families with the best access; to the extent that some part of this improvement reflects change in access from 1985-89 to 1990-94, these fast declines are consistent with improved access reducing mortality risks. The pattern of differentials in U5MR in 1990-94 suggests that access to a Family Welfare Center and to a hospital are both associated with reduced mortality risks.

Multivariate Analysis of Child Mortality Risks

The bivariate analyses just described are difficult to interpret because variables may covary in ways which make them appear all to be related to child mortality differentials. Multivariate analysis can go some way towards identifying those variables which are truly related to child mortality differentials. Two types of analysis will be presented below. Some characteristics which we may expect to be related to mortality risks can be thought of as being permanent characteristics of a child; such variables include the education levels of the parents, and reproductive dynamics variables such as age of mother at the birth of the child, birth order, or birth interval. Since these characteristics do not change with time, a multivariate analysis of the data collected by a birth history can be legitimately applied over a long time frame. We have used the birth history data from 1970 onwards to examine differentials and trends in child mortality in a number of age ranges (neonatal, postneonatal, 12-23 months, 24-35 months, 36-47 months, and 48 to 59 months). Certain other characteristics of children change over time, but the full history of values are not collected by the BDHS. Examples of such variables include the socio-economic status and living conditions of the household, or access and use of health services. It is only legitimate to use these ephemeral variables for the recent mortality experience of children. Here, we have related mortality risks in the three years before the BDHS to these ephemeral characteristics (strictly speaking, many of these variables are defined by current status at survey, and so should not really be related to mortality risks in the past at all; we believe that the errors introduced by using a three year window are minimal). The presentation below is divided into two parts, one of long run mortality risks related to permanent characteristics, and the other of recent mortality differentials related to both permanent and ephemeral characteristics.

Permanent Characteristics

The permanent characteristics used are education of the mother and father and reproductive dynamic characteristics of the birth, specifically whether the mother was young (under 20) or old (35 or over) at the time of the birth, whether the child's birth order was first, second through fourth, or fifth or higher, and the log of the birth interval preceding the child's birth (set equal to the average across the whole data set for first births). Six age ranges of children were used: the risk of dying in the first month of life, between one and 11 months, between 12 and 23 months, between 24 and 35 months, between 36 and 47 months, and between 48 and 59 months. The modeling strategy used for each age range was first to define a time variable using linear splines, dividing the 1970 to 1994 period into five time periods (calendar years between 1970 and 1974, 1975 and 1979, 1980 and 1984, 1985 and 1989, and 1990 and 1994) and to use logistic regression to the time variables to identify significant changes in trend over the period. If differences between the coefficients on sequential time variables were not significant, the periods were combined. Once the time variables had been defined to pick up trends, the education variables (whether the mother had primary education, whether the mother had secondary education, whether the husband had high primary education (4 or more years), whether the husband had secondary education) were introduced into the model. The time variables were then introduced into the model with the reproductive dynamics variables. Finally, the time, education and reproductive dynamics variables were included in the model together. Results for each model and each age range are shown in Table 2. The results are described briefly below.

Neonatal mortality. No significant differences in rate of change of neonatal mortality were identified after 1975, so periods after 1975 were combined into one variable. Model 1 (with only time variables) shows a slight, non-significant increase in neonatal mortality each year from 1970 through 1974, and then a steady and highly significant decline of close to 4 percent per year from 1975 onwards. In model 2 (with education variables) both mother's and husband's secondary education are strongly associated with reduced risk, while primary and high primary education are associated with reduced risk, but not significantly so. The trend variables remain similar, though the annual rate of reduction from 1975 onwards is slightly reduced, indicating that a small part of the downward trend is the result of increasing education levels. In model 3 (with reproductive dynamic variables) neonatal risks are very significantly higher for children born to mothers under 20 and for first births, and significantly higher for mothers over 35 and for fifth or higher parity births; the most dramatic effect, however, is that of the log of the preceding birth interval, which shows a very highly significant increased risk for children born after short birth intervals. In model 3, the downward trend time variables have slightly lower coefficients, indicating that some portion of the trend is accounted for by changes over time in the composition of births by reproductive dynamic risk factors. In model 4 (all variables) the education variables become significant, and all the reproductive dynamic factors except high parity remain significant. The trend variables change slightly, suggesting a 2.4 percent annual increase in neonatal mortality between 1970 and 1974, followed by a 3.6 percent annual decline in neonatal mortality from 1975 onwards. Roughly speaking, about 10 percent of the decline in neonatal mortality since 1975 is accounted for by structural factors (changing composition of mothers and husbands by education, changing distributions of births by reproductive dynamic factors); the remaining 90 percent is accounted for by factors not included in the model.

Postneonatal mortality. In the case of postneonatal mortality it was not possible to collapse the time variables, so five time periods are included. The first period (1970-74) was associated with postneonatal mortality increasing at an annual rate of over 7 percent, followed by a rapid decline in the late 1970s exceeding 9 percent, followed by virtually no change through the 1980s, and renewed sharp decline in the early 1990s. In model 2, all the education variables have negative coefficients, but only secondary education of the mother reaches significance. In model 3, the length of the birth interval remains very highly significant, while first births have highly significantly higher risks, and births to older and higher parity mothers have significantly higher risks. In the full model, the trend variables prior to 1990 do not change much, but the decline in the 1990s is smaller, and loses significance. All the education variables have negative signs, but only secondary education of the mother remains significant. All the reproductive dynamic variables have the expected signs, but only birth interval and first births remain significant. Compositional changes had little to do with postneonatal mortality declines in the late 1970s, but accounted for almost one third of the decline in the early 1990s.

Mortality in the Second Year of Life. The time trends alone from model 1 show a different pattern for mortality between 12 and 23 months. The period 1970-74 is associated with a significant reduction in mortality risk, the period 1975-79 is associated with a significant increase in risk, and then there is a fairly steady decline at a rate of over 5 percent per year since 1980. For this age range, all the maternal education variables are associated with reduced risk, all but husband's high primary significantly so. The reproductive dynamic variables in model 3 are of much reduced significance except for birth interval; indeed first births appear to have lower risks after their first birthdays. In

the full model, the downward trend since 1980 is hardly affected by the inclusion of other variables, the education variables all retain negative signs, but only mother's primary and husband's secondary education remain significant, and only birth interval remains a significant risk factor in the reproductive dynamic category.

Mortality in the Third Year of Life. For this age range the time trends return to a familiar pattern of increasing (but not significantly so) risk in the early 1970s followed by a steady and significant decline (of about 5.5 percent per year) since 1975. The education variables all have negative signs, with husband's education highly significant, and both mothers primary and husband's higher primary education associated with significantly reduced risk. Of the reproductive factors, birth interval remains highly significant, but none of the other reproductive dynamic factors reach significance, and being a firstborn child is associated with reduced risk. In the full model, nothing much changes; the education variables remain protective, short birth intervals remain risky, and the downward trend since 1975, averaging about 5.5 percent per annum, appears to be entirely due to factors other than changing composition of births.

Mortality in the Fourth Year of Life. For this age range, mortality risks increased in the early 1970s, and have fallen steadily since 1975 at about 5.7 percent per year. All the education variables are associated with reduced risk, all but mother's secondary education significantly so. Surprisingly, all the reproductive dynamic risk factors except short preceding birth interval are associated with reduced risk, significantly so in the case of a mother under 20 at the time of the birth (such a mother would generally by well into her 20s by the time this exposure period starts).

Recent Characteristics

Many of the characteristics of households, mothers and children recorded by the BDHS cannot be regarded as fixed over time. This is particularly true of the outcomes of interventions in the health sector. Immunization rates have been rising over the last decade, tubewells have become the predominant source of drinking water, and access to primary health care has increased sharply. Given these changes, characteristics of households observed at survey cannot be regarded as fixed over time; analysis has been limited to only those children born in the three years before interview. A further complication is that some information about children, such as immunizations and vitamin A supplementation, is only available for surviving children. Information of this sort can obviously not be used in a model of survival. In order to circumvent this problem, we have used average levels of service use in each cluster, in the expectation that the proportion taking advantage of some intervention among surviving children aged 12 to 35 months adequately reflects the likelihood of both surviving and dead children having had the opportunity to use the intervention.

We have carried out analysis for three age ranges, neonatal, postneonatal and 12-23 months. The number of deaths of children at ages 12-23 months in the three years prior to interview is very small (36), further limiting the range of variables that could be included in the model. Results are shown in Table 3.

Neonatal Mortality. Education variables generally have negative coefficients, but none reach significance. Having a mother under 20 or over 35, being a first born child or a 5th or higher order child, and having a short preceding birth interval are all associated with higher risk, though only

having a mother over 35, being a first birth, or having a short preceding birth interval are significant (strongly in the case of birth interval). Children born in urban slums have increased risk of neonatal mortality, though the large coefficient is not significant, not surprisingly given the small number of births in the category; rural residence is associated with a slight, non-significant increase in risk. Getting drinking water from a table or from "other" sources is associated with higher (though not significantly) risk than getting water from a piped source. This risk is slightly higher than the risk from other sources, but since children in the first month of life do not drink much water, the water source is probably a proxy for other (unobserved) factors. The level of BCG immunization in the cluster, the proportion of deliveries in the cluster performed by a physician, and the proportion of deliveries in the cluster performed by a trained birth attendant are all associated with reduced risk, though not significantly so. Indicators of poor access to health services (relative to having a health center within a mile and a hospital within 5 miles) are all associated with increased risk, significantly so for categories three, four and five (see Table 1 for a description of the categories), and the risk rises monotonically from category two through category five as access gets worse. Only the last (worst access) category does not fit in this continuum, but still has elevated risk. The pattern of the access category coefficients suggests that access both to a health center and to a hospital are important in reducing neonatal mortality risks.

Postneonatal Mortality. For postneonatal mortality the education variables are all negative, significantly so the mother's secondary education. The reproductive dynamic variables all have expected signs, though only a short preceding birth interval is significant. Children in urban slums have elevated risk, though not significantly so, while there is little excess mortality in rural areas as opposed to urban non-slums. Both tubewells and other sources of drinking water are associated with reduced mortality risks (relative to piped water), though not significantly so. Proportions of children with BCG immunization, proportions delivered by a physician, and proportions delivered by a TBA are all associated with increased risk, significantly so for BCG, while the proportion receiving vitamin A in the six months before interview is significantly associated with reduced risk. All the access variables are associated with increased risk (relative to the reference category of good access), in most cases significantly so.

Mortality at Ages 12 to 23 Months. The education variables and all the reproductive dynamic variables except short birth interval were found to be non-significant for this age range. Indeed, the only significant variable in this model is the log of the length of the preceding birth interval, which remains strongly negatively associated with mortality risk. None of the service utilization variables (water, BCG and measles immunization, vitamin A) are significant, and a number of the access variables, while not significant either, are negative. The number of deaths in this age range is very small.

Conclusions

Childhood mortality has been declining in Bangladesh since the mid 1970s at a rate of about 3.5 percent per year. A small part of the decline can be accounted for by increasing education levels among parents, and by changes in reproductive dynamics associated with declining fertility. However, a large chunk of the decline, close to 90 percent, has to be explained in some other way.

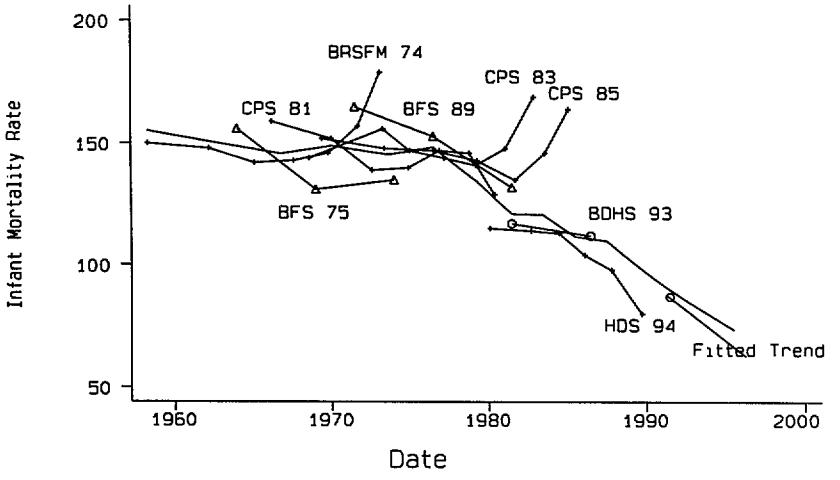
The mortality of young children in the three years before interview suggests that some health interventions have probably reduced mortality risks. Access to primary health care appears to be

associated with reduced risk, as does vitamin A use, but the data provide no support for a protective role for childhood immunizations. In the neonatal period, parental education is not significantly associated with reduced risk, but children of older mothers, first births, and children born after a short interval all have increased risk. Children born in urban slums also appear to have high risk. In the postneonatal period, secondary education of the mother is protective, and short preceding birth interval increases risk. In the age range 12 to 23 months, only short preceding birth interval has a significant (upward) effect on mortality risk. No significant effects of source of drinking water are found in any age range.

The mortality decline since 1975 remains largely unexplained by these data. Although health interventions have probably reduced mortality risks since 1975, much of the decline remains unaccounted for.

FIGURE 1: Trends in Child Mortality in Bangladesh: BDHS 1993 and Other Sources.

A. Infant Mortality Rate



B. Under 5 Mortality Rate

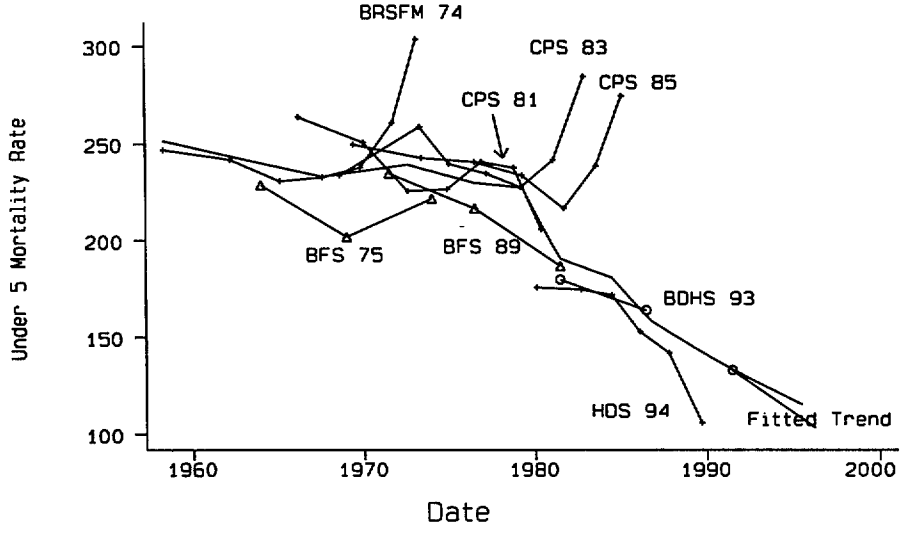
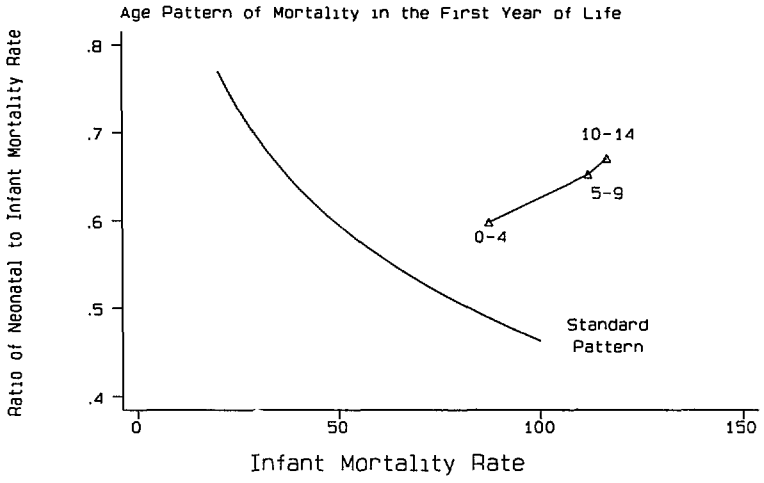


FIGURE 2: Age Patterns of Childhood Mortality in Bangladesh Compared to Standard Patterns

A. Mortality in Infancy



B. Mortality Under Age 5

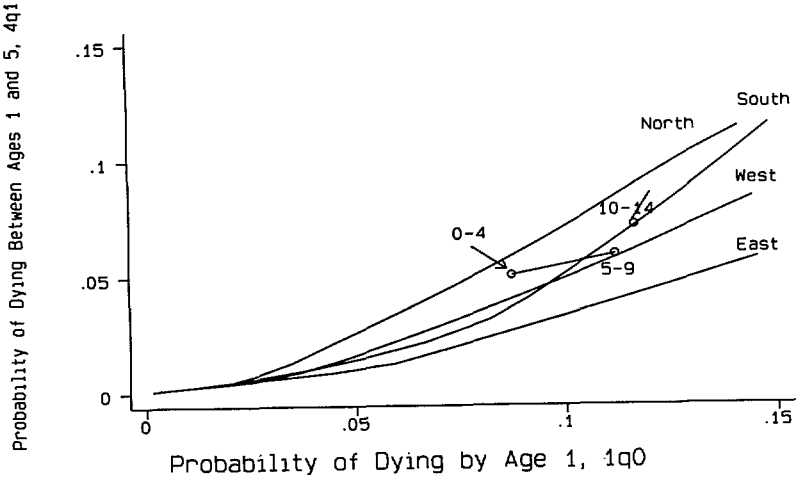


Table 1: Differentials and Trends in Childhood Mortality in Bangladesh 1985 to 1994

Variable	Category	Neonatal Mortality Rate			Infant Mortality Rate			Under 5 Mortality Rate		
		1985-89	1990-94	% Decline	1985-89	1990-94	% Decline	1985-89	1990-94	% Decline
Total	Country	73.5	51.1	30	110.5	80.6	27	166.4	121.4	27
Division of Residence	Rajshahi	71.8	54.6	24	107.6	87.6	19	160.9	125.1	22
	Dhaka	76.5	50.2	34	116.7	82.0	30	182.6	141.4	23
	Chittagong	74.7	49.0	34	114.3	86.5	24	175.2	127.9	27
	Khulna	66.0	50.2	24	96.6	72.4	25	121.9	8.8	27
	Barisal	71.7	54.6	24	104.1	72.4	30	155.7	98.9	36
Type of Residence	Urban Slum	64.6	51.8	20	137.6	76.4	44	180.6	111.4	38
	Urban Non-Slum	59.8	31.0	48	96.5	48.6	50	130.9	75.8	42
	Rural	74.8	53.1	29	111.3	83.9	25	169.4	126.0	26
Mother's Education	None	82.2	54.5	34	123.6	90.3	27	188.4	138.0	7
	Primary	63.3	49.8	21	95.6	76.7	20	142.4	102.9	28
	Secondary	45.2	39.4	13	65.8	48.2	27	126.9	93.1	27
Father's Education	None/Low Primary	82.5	56.6	31	122.6	91.4	25	188.4	138.0	7
	High Primary	64.6	40.3	38	96.3	64.3	33	142.4	102.9	28
	Secondary	56.6	44.3	22	88.7	65.0	27	126.9	93.1	27
Father's Occupation	Agriculture	75.7	57.9	24	112.0	86.2	23	170.0	127.6	25
	Unskilled Laborer	86.8	63.7	27	128.4	102.0	21	196.8	154.5	21
	Semi-skilled	63.9	25.7	60	110.6	40.7	63	161.5	70.0	57
	Professional	55.8	33.5	40	79.4	55.3	30	130.1	77.6	40
	Business	65.5	38.6	41	97.5	67.8	30	142.0	102.9	28
Birth Order	First	97.9	70.5	28	131.5	99.8	24	175.8	131.2	25
	2-4	62.4	43.6	30	97.5	69.5	29	159.3	113.0	29
	5+	72.9	47.0	36	115.8	84.1	27	171.3	128.0	25
Preceding Birth Interval	<2 years	105.5	76.9	27	165.6	129.2	22	245.4	193.0	21
	2 years	60.2	49.8	17	94.7	80.6	15	159.3	131.3	18
	3 years	42.4	24.0	43	71.7	48.0	33	114.8	82.8	28
	4+ years	37.8	31.7	16	52.9	48.0	9	85.9	62.1	28

Table 1: (Continued)

Variable	Category	Neonatal Mortality Rate			Infant Mortality Rate			Under 5 Mortality Rate		
		1985-89	1990-94	% Decline	1985-89	1990-94	% Decline	1985-89	1990-94	% Decline
Mother's Age at Time of Birth	<20	90.2	72.2	20	126.8	105.2	17	181.4	141.7	22
	20-34	66.8	41.2	38	101.8	68.9	32	159.7	111.6	30
	35+	61.9	67.1	-8	115.7	101.7	12	158.2	141.0	11
Usual Source of Drinking Water	Piped	21.6	12.5	42	53.3	36.3	32	79.2	47.9	40
	Tubewell	73.7	52.3	29	111.1	82.6	26	167.2	123.9	26
	Other	89.9	55.1	39	125.0	79.4	36	190.5	125.7	34
Access to Health Services	1 (best)	57.1	15.4	73	90.6	40.3	56	148.0	71.2	52
	2	65.0	36.2	44	107.9	70.6	35	161.2	111.6	31
	3	83.4	52.2	37	116.3	75.5	35	174.0	113.4	35
	4	70.4	65.2	7	109.8	96.1	12	161.9	139.7	14
	5	96.7	96.1	1	144.9	114.3	21	243.3	161.1	34
	6 (worst)	65.2	42.6	35	98.5	91.9	7	142.3	140.3	1

Codes for Access to Health Services:

1. : Family Welfare Center < 1 mile, Hospital less than 5 miles
2. : Family Welfare Center < 1 mile, Hospital 5 or more miles
3. : Family Welfare Center 1 to 3 miles, Hospital less than 5 miles
4. : Family Welfare Center 1 to 3 miles, Hospital 5 or more miles
5. : Family Welfare Center 4 + miles, Hospital less than 5 miles
6. : Family Welfare Center 4 + miles, Hospital 5 or more miles

Table 2: Childhood Mortality Change in Bangladesh by Age Range: 1970 - 1993

	Neonatal Mortality				Post-Neonatal Mortality			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Year 1970-74	.0063	.0088	.0204	.0242	.0744*	.0786*	.0901**	.0953**
Year 1975-79	-.0389**	-.0381**	-.0360**	-.0355**	-.0928**	-.0910**	-.0932**	-.0909**
Year 1980-84					.0068	.0047	-.0052	-.0079
Year 1985-89					-.0049	-.0022	.0036	.0056
Year 1990-94					-.1952*	-.1837	-.1354	-.1217
Mother's Primary		-.1072		-.1287*		-.1461		-.1429
Mother's Secondary		-.3597**		-.4061**		-.5991**		-.6104**
Husband's Higher Primary		-.1097		-.1303*		-.1504		-.1765
Husband's Secondary		-.1938**		-.1842**		-.1821		-.1803
Mother <20			.2312**	.2137**			.0894	.0661
Mother >=35			.2932*	.2654*			.3318*	.3040
First Birth			.3098**	.3423**			.2602**	.3402**
Birth Order 5+			.1392*	.1071			.1907*	.1489
Log (PBI)			-.9731**	-.9847**			-.9649**	-.9793**
Constant	-2.668	-2.742	-.699	-.815	-8.308	-8.481	-6.396	-6.583

* Significant at 5% level
** Significant at 1% level

Table 2: (Continued)

	Mortality 12-23 Months				Mortality 24-35 Months			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Year 1970-74	-.1535**	-.1474**	-.1359**	-.1283**	.0957	.1050	.1035	.1145*
Year 1975-79	.0714	.0727	.0709	.0734				
Year 1980-84					-.0551**	-.0554**	-.0560**	-.0560**
Year 1985-89	-.0530**	-.0532**	-.0526**	-.0539**				
Year 1990-94								
Mother's Primary		-.3482**		-.3502**		-.3227*		-.3196*
Mother's Secondary		-.4197*		-.4172		-.2930		-.2648
Husband's Higher Primary		-.1299		-.1597		-.3276*		-.3561*
Husband's Secondary		-.4865**		-.4957**		-.5898**		-.6022**
Mother <20			.0314	.0153			.0030	-.0137
Mother >=35			.0389	-.0151			.0462	-.0135
First birth			-.0720	-.0349			-.1878	-.1526
Birth Order 5+			.0196	-.0290			.0940	.0533
Log (PBI)			-.9599**	-.9775**			-.8106**	-.8376**
Constant	7.668	7.444	9.564	9.304	-10.625	-11.051	-8.470	-8.919

Table 2: (Continued)

	Mortality 36-47 Months				Mortality 48-59 Months			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Year 1970-74	.0457	.0545	.0406	.0539	.0061	.0168	.0227	.0368
Year 1975-79 Year 1980-84 Year 1985-89 Year 1990-94	-.0580**	-.0577**	-.0575**	-.0572	-.0112	-.0106	-.0094	-.0085
Mother's Primary		-.3369*		-.3290**		-.5057*		-.5223*
Mother's Secondary		-.6628		-.6430		-.6855		-.7344
Husband's Higher Primary		-.4600		-.4892*		-.3455		-.3555
Husband's Secondary		-.5257*		-.5507**		-.1945		-.1987
Mother <20			-.3389*	-.3532*			.0465	.0386
Mother >=35			-.3762	-.4435			-.0789	-.1364
First birth			-.2721	-.2314			.1743	.2076
Birth Order 5+			-.0929	-.1438			-.0140	-.0603
Log (PBI)			-.7866**	-.8241**			-.4976*	-.5201*
Constant	-7.028	-7.396	-3.812	-4.371	-5.274	-5.834	-4.907	-5.632

Table 3: Logistic Regression Results for 3 years before BDHS with "Current" Factors			
	Neonatal	Post-Neonatal	12-23 Months
Education: (reference categories are none)			
Mother's Primary	.003	-.062	N/A
Mother's Secondary	-.232	-1.280*	N/A
Father's High Primary	-.251	-.321	N/A
Father's Secondary	-.057	-.013	N/A
Reproductive Dynamics: (reference categories are age 20-34 at birth, birth order 2-4)			
Mother <20 at birth	.195	.269	N/A
Mother 35+ at birth	.656*	.360	N/A
First birth	.424*	.044	N/A
5th or higher birth	.021	.354	N/A
Log (PBI)	-.926**	-.972**	-1.004*
Residence: (reference category: urban non-slum)			
Urban Slum	.948	.479	N/A
Rural	.152	.066	.348 (vs all urban)
Source of Drinking Water: (reference category: piped)			
Tubewell	.797	-.189	-.086 (vs all other)
Other	.661	-.332	N/A
Immunizations:			
BCG	-.228	1.167*	-.148
Measles	N/A	N/A	.025

Table 3: (Continued)

	Neonatal	Post-Neonatal	12-23 Months
Delivery Care:			
Physician	-.651	.263	N/A
Trained Birth Attendant	.611	.652	N/A
Health Service Access: (reference category: highest)			
Code 2	.821	1.410*	-.412
Code 3	1.162**	1.000	-.792
Code 4	1.367**	1.163*	-.677
Code 5	1.900**	.692	.244
Code 6	.962	1.850**	-.818
Vitamin A in last months:			
Cluster prop.	N/A	-.954**	-.086
Constant	-1.431	-2.017	.039

The Linkage between Infant and Child Mortality and Subsequent Fertility in Bangladesh

M. Ataharul Islam, Nitai Chakraborty, Nazneen Chowdhury, Sayema Sharmin

Introduction

This paper investigates the linkage between infant and child mortality and fertility in Bangladesh. In many cultural settings, the increase in likelihood of pregnancy among women who experience child loss is evident. The infant mortality in Bangladesh is still one of the highest in the world. The infant mortality rate is 101 per 1000 live births, out of which the share of neonatal mortality is 64 percent (BDHS, 1994). The high infant mortality rate in Bangladesh poses a formidable challenge to the family planning programme of Bangladesh since survival of a new born influences decision making process about the size and structure of a family.

Both biological and behavioral factors may increase the level of fertility as a response to infant and child mortality. The relationship between infant/child mortality and subsequent fertility can be explained by the following effects: (i) the physiological or biological effect: by the death of a child the postpartum infecundable period is shortened owing to an interruption of lactation (Chowdhury, Khan and Chen, 1976; Santow and Bracher, 1984; Chandran, 1989; Park et al., 1996); and (ii) the behavioral or replacement effect: child death may cause the parents to make deliberate efforts to bear another child in the hope of replacing the lost child (Chowdhury, Khan and Chen, 1976; Balakrishnan, 1978; Park, Han and Choe, 1979; Knodel, 1981; Suchindran and Adalkha, 1984; Mensch, 1985; Rao and Beaujot, 1986; Park et al., 1996). The critical examination of the nature of these effects can provide guidelines to policy makers on relevant policy issues to reduce the level of fertility.

MCH-FP programmes in Bangladesh have been successful in the recent past in increasing the level of contraceptive prevalence to a moderately high level. As regards policy implications, the future of a successful FP programme depends, among other factors, on improvement in MCH programmes. This paper highlights both biological and behavioral factors related to infant and child mortality and fertility. In addition to biological and behavioral factors, the impact of fertility regulation during the subsequent birth interval is also examined in this paper.

Data and Methods

In order to examine the effects of infant/child mortality and subsequent fertility, data from the 1993/94 Bangladesh Demographic Health Survey data is used. Each respondent was asked about the birth and death history of her children. The index birth in this study is any birth that occurred during the period 1988-94. In case of more than one birth during this period, each birth is considered as an index birth

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separately. The previous birth refers to the birth immediately preceding the index birth. The subsequent birth interval refers to the birth interval since the birth of the index child. The death or survival of the index child is observed till the conception for the next birth or the date of interview, whichever comes earlier.

The following variables are considered in this study: (i) subsequent birth interval (since the birth of the index child), (ii) place of residence (urban or rural), (iii) survival status of the index child, (iv) survival status of the previous child, (v) sex of the index child, (vi) age at death of the index child, (vii) duration of ppa (index child), (viii) whether the index pregnancy was wanted or not, (ix) education level of respondent, (x) age of mother at the time of birth of the index child, (xi) birth order, (xii) time of conceiving the index child, (xiii) use of family planning methods after the birth of the index child, (xiv) number of children died before the index child was born, and (xv) duration of breastfeeding after the birth of the index child, etc.

Background characteristics for selected variables are shown in Table 1 (see appendix) and the definitions for selected variables are given in the following table:

Table 2: Definition of Variables

Variabes	Definition
CSB	Subsequent Birth Interval: Birth interval since the birth of index child (in months).
CPPA	Duration of Post-partum Amenorrhea after the birth of index child (in months).
Z1	Z1=1, if the index child dies during post-partum amenorrhea; =0, otherwise.
Z2	Z2=1, if the index child dies after PPA but before the next conception; =0, otherwise.
CSEX	CSEX=1, if the index child is male; =0, if female.
CND	Number of children died before the birth of the index child.
BORDR	Birth order of the index child.
MAGECB	Age of mother at the time of birth of index child.
AGEMAR	Age at marriage of the respondent.
EDU1	EDU1=1, if the repondent has primary level of education; =0, otherwise.
EDU2	EDU2=1, if the repondent has secondary level of education; =0, otherwise (Respondents without having formal education constitute the reference group).
URBAN	URBAN=1, if the respondent lives in urban areas; =0, otherwise.
WNT	WNT=1, if the pregnancy for the index child was planned (then or later); =0, otherwise.
REL	REL=1, if Muslim; =0, otherwise.

The variable Z1 represents the combined biological and behavioral aspects of infant mortality before the resumption of menstruation. With the death of a child during PPA, breastfeeding is stopped and an early resumption of menstruation is the logical consequence. In addition to early cessation of PPA, due to physiological changes, the intention of parents to replace their lost child by another child may also shorten the period of the subsequent birth interval. The behavioral effect is represented by Z2, which represents the death of an index child after PPA but before the conception for an additional birth.

Three family planning variables are constructed here to examine the role of temporary reversible, semi-permanent, and traditional methods. These variables are: (i) TEMPM: TEMPM=1, if the respondent had used any modern temporary methods such as oral pills and condoms after the PPA since the birth of the index child and prior to the next conception; TEMPM=0, otherwise; (ii) SEMIM: SEMIM=1, if the respondent had used any semi-permanent methods such as IUD or injection after the PPA since the birth of the index child and prior to the next conception; SEMIM=0, otherwise; and (iii) TRADM: TRADM=1, if the respondent had used any traditional methods such as periodic abstinence. withdrawal or other traditional methods after the PPA since the birth of the index child and prior to the next conception; TRADM=0, otherwise.

In our analysis, a total of 8486 child births are considered for the period 1988-1994. For analyzing the data, the subsequent birth intervals are obtained for all the index children. The closed birth intervals are defined as uncensored and the open ended intervals as censored. In analyzing the subsequent birth intervals, life tables (actuarial) are used to estimate the median birth intervals by place of residence, survival status of the index child, sex of the index child, a variable constructed for representing the behavioral effect, a variable constructed for examining the combined effect of biological and behavioral aspects associated with a death during PPA, number of children died prior to the birth of an additional child, birth order, and use of contraceptives since the birth of the index child.

The survival function estimates for birth intervals, which indicate the probability of spacing (intended or unintended) an additional birth since the birth of an index child, are obtained by using the actuarial method. For some of the variables, the Product-Limit estimates of the mean are displayed. However, the P-L estimates are shown only for heavily censored data when the actuarial method could not produce estimates for medians. The P-L estimates in this situation appear to be biased due to no known information about the largest observation. The stratified analysis for various categories f selected variables are compared for testing the hypothesis that the survival function estimates of probabilities are not different. The Log-Rank Chi-square test statistic is employed for testing the equality of various survival functions (Kleinbaum, 1996).

The data on breastfeeding were collected only for the last three births which reduced our subsequent birth intervals to 5327 for multivariate logistic regression analysis. Two logistic regression models are used in this study: Model 1 consists of biological and behavioral variables, Z1 and Z2, and other socioeconomic and demographic variables that may influence subsequent birth intervals, and Model 2 considers, in addition to variables mentioned for Model 1, variables representing use of temporary, semi-permanent or traditional methods of contraception after the postpartum amenorrhea period.

Background Characteristics

Mother's age at birth of the index child indicates that a large proportion of births take place before eighteen years (15 percent of all subsequent births). This finding has strong policy implications for both the health of the mother and child. This group of women is less likely to practice any method of contraception for spacing births but more likely to encounter severe health hazards. The proportion of women currently pregnant in the age group 15-19 at the time of interview in the 1993-94 BDHS was 17.1 percent, 4 and 8 percentage points higher than in the age groups 20-24 and 25-29, respectively. Almost half of the total births took place during 18-24 years, compared to 18 percent in the older age groups (30 or higher). Out of all the index births, 87 percent took place in rural areas, and 50.6 percent were males. Fifty-eight percent of the respondents do not have any schooling, while the percent illiterate among husbands was 48 percent. Among the respondents who had any childbirth during 1988-94, 28 percent had primary and 12 percent had secondary levels of schooling. It is surprising to note that about half of all the index births were not planned. The subsequent birth intervals since the birth of index children show that 60 percent are less than 48 months, uniformly distributed in the intervals 10-23 and 24-47 months. However, a large proportion of these intervals are open ended. If we consider only the closed birth intervals, then more than two-thirds of the subsequent birth intervals are observed to end with another birth in less than 4 years. Among the index children, the rate of mortality appears to be 110 per thousand live births during the period 1988-94. Prior to the birth of the index child, 40 percent of the mothers had experienced the death of one or more children.

Figure 3.1 Percent Distribution of Mother's Age at Birth of Index Children

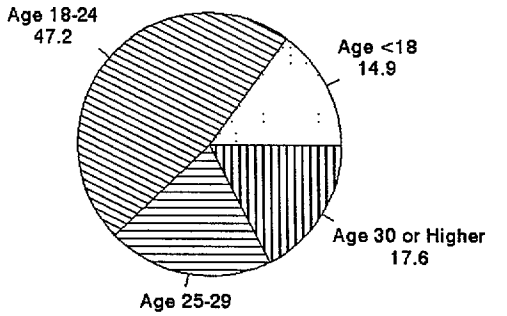
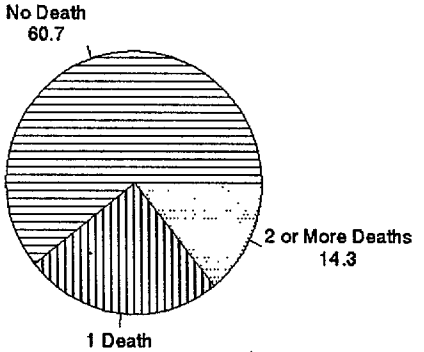


Figure 3.2 Percent Distribution of Number of Children Died Before the Additional Births

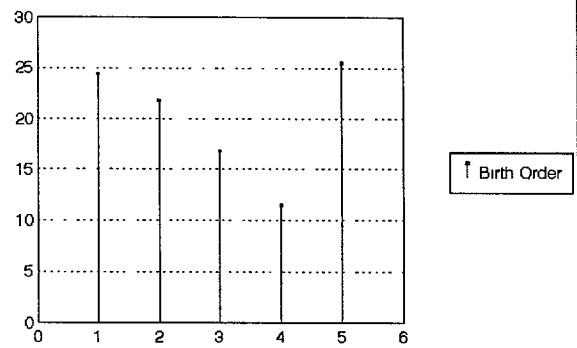


Out of the 8486 birth intervals considered in this study, one-fourth are first order births, 22 percent are second order births, 17 percent are third order births, and the remaining 37 percent are fourth or higher order births. Among these births, a large proportion (15 percent) occur to teenage mothers, which is reflected in the large proportion of first order births.

Among index births, 7 percent of the infants were never breastfed, while 15 percent were breastfed for 1-5 months, 14 percent for 6-11 months and 29 percent for 12-23 months. The largest proportion of the children (more than one-third) were breastfed for a duration of more than two years.

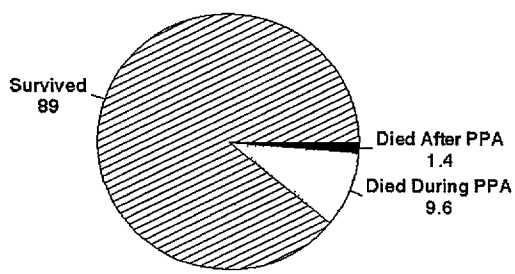
The distribution of PPA after the birth of an index child shows that 56 percent of the mothers resumed their menstruation within two months, 10 percent in 2-5 months, and one-fourth in 6-17 months. The resumption of menstruation was longer than or equal to 18 months for the remaining 9 percent of the mothers.

Figure 3.3 Percent Distribution of Subsequent Birth Intervals by Birth Order



Eleven percent of the index children died during the period of reference (1988-94). About 9.6 percent of all subsequent births ended with infant (mostly neonatal) mortality before the resumption of menstruation. In addition, 1.4 percent of the subsequent births ended with the death of the index child after the resumption of menstruation but before the time of conception of the next birth. It is observed that 47 percent of the births were preceded by use of methods of contraception after the PPA during the subsequent birth interval periods.

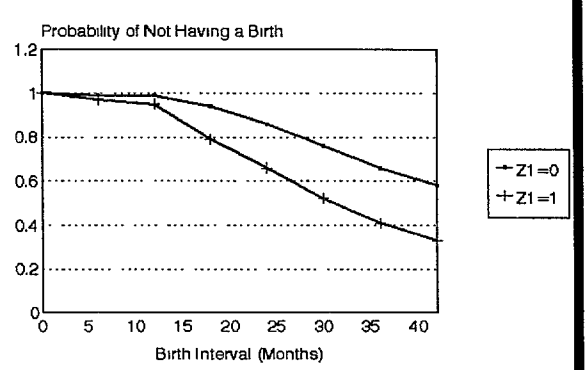
Figure 3.4 Percent Distribution of Index Children by Survival Status Before or After PPA



Median Birth Intervals

The estimated median birth intervals show significant differences. For instance, if the child dies before the PPA, then the median birth interval is reduced by about 18 months. The gaps in the estimated probabilities of not having an additional child since the birth of the index child appears to widen over time, indicating that the women without a child death during PPA would delay (or limit) their next conception further. If the index child dies after PPA but before conceiving the next child, then the birth interval is reduced by about 7.5 months.

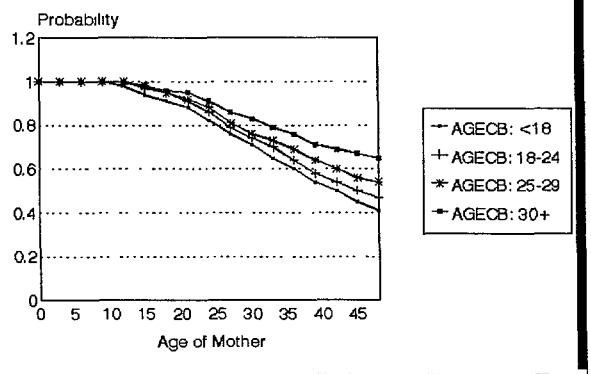
Figure 4.1 Estimated Probabilities of Not Havings Births by Survival Status During PPA



Similarly, median birth intervals are estimated to obtain differential patterns by other socio-economic and demographic variables. The birth intervals show a clear trend of increase over time. The cohort specific median birth intervals show an increase of 5.7 months (from 42.2 months among 1988 births to 47.9 months among 1990 births). This increase is statistically significant and it indicates that subsequent birth intervals have been increasing over time. However, this assertion is

based on retrospective data which can be biased to some extent in absolute differences, but the general trend would be consistent with other indications, such as an increase in the level contraceptive use.

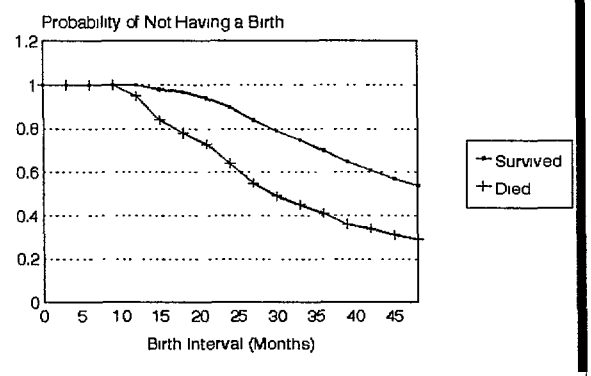
Figure 4.2 Estimates of Probability of Not Having an Additional Birth by Age of Mother at Birth



A substantial increase in median birth intervals is observed, from 42 months for birth order 1 and 64 months for birth order 5 or higher. Similarly, the lowest median birth interval is found among teenage mothers (42 months) which increases with age at child birth to 52 months for age group 25-29 years.

In urban areas, the median birth interval is seven months higher than in rural areas. A similar increase is evident by level of education, from 46 months for women without any schooling to 62 months for those who attended college or higher level of education.

Figure 4.3 Estimated Probabilities of Not Having Births by Survival Status of Child



The survival of the index child greatly increases the length of the median birth interval (by about 22 months). One or more deaths prior to the birth of an additional child results in a reduced subsequent birth interval. This is more distinctly evident in median birth intervals for birth order as shown in Table 4. The median birth interval for the birth orders 1-2 is 42 months in the case of any prior death. Median birth intervals are increased by 8 months if such prior deaths are avoided. However, the influence of the death of the index child has a stronger impact on the subsequent birth interval. The birth interval could be increased by 18 months by avoiding the death of the index child before the resumption of menstruation, and by 7 months by avoiding the child death after the resumption of menstruation. Table 4 indicates that there is an inverse relationship between number of children dead and median subsequent birth intervals. In other words, the more children die, the more is the likelihood of another pregnancy to replace the lost child at an increasingly shorter interval.

Finally, use of family planning methods increases mean birth intervals. The increment in median birth intervals is 34 months for non-users and 50 months for those who use a method of contraception for 12-17 months.

Table 4: Median Birth Intervals by Birth Order and Number of Children Died

Birth Order	Children Died	Median Birth Interval (months)
1	0	42.0
2	0	49.1
	1	41.5
3	0	53.3
	1	45.6
	2	37.3
4	0	65.0
	1	52.8
	2	46.3

Multivariate Logistic Regression Analysis of Birth Intervals

Logistic regression models are employed to obtain the effect of the selected behavioral, biological and other socioeconomic-economic and demographic variables on subsequent fertility. The analysis reveals important findings that can be utilized in policy formulations for reducing the level of fertility at a more rapid pace.

In this study, two logistic regression models are used. In both models, we have used the subsequent birth interval after the birth of an index child as the dependent variable. In other words, if a subsequent birth interval is ended with a birth then the dependent variable is denoted by 1, otherwise, the dependent variable takes a value of 0. The first model (Table 5A) considers the selected variables excluding the variable on use of contraception. The second model (Table 5B) considers all the selected variables including use of contraception after the resumption of menstruation. The second model is constructed in order to examine the impact of family planning use in addition to the impact of biological and other behavioral factors of interest.

It is observed from Table 5A that Z1, which represents a combination of biological and replacement effects, operates positively on the likelihood of a subsequent birth after the death of an infant before the resumption of menstruation. The odds of a subsequent birth, after breastfeeding the index child fully or partially during PPA, appears to be 5.3 times higher for those who experience a child-loss before the resumption of menstruation than those who do not have such experience.

If the child-loss occurs after the resumption of menstruation but before the time of next conception (Z2), then this can lead to the behavioral effect of child-loss. Table 5A shows that those who experience a child-loss after PPA but before next conception are 1.7 times more likely to have another pregnancy than the women in the reference category, comprising of women whose children survived through the time to next conception or subsequent birth interval.

The biological effect of a child death can be obtained by subtracting the effect of replacement effect (Z2) from that of the combined biological and biological effects (Z1). In other words, the odds of a

subsequent child birth among women who experience an early child loss increases 3.1 times due to biological effect when compared to women not experiencing an early child loss.

Table 5A: Logistic Regression Estimates for Selected Covariates (Excluding Family Planning Variables)

Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square
INTERCEPT	-0.1217	0.3113	0.1528	0.6959
Z1	1.6749	0.1295	167.1729	0.0001
Z2	0.5508	0.2786	3.9073	0.0481
MAGECB	-0.1038	0.0139	56.1842	0.0001
CSEX	-0.0386	0.0759	0.2582	0.6114
BORDR	0.0994	0.0419	5.6375	0.0176
AGEMAR	0.0585	0.0175	11.1046	0.0009
CNDD	0.1312	0.0770	2.9006	0.0885
WNT	-0.4657	0.1137	16.7727	0.0001
EDU1	-0.2453	0.0898	7.4661	0.0063
EDU2	-0.2487	0.1203	4.2749	0.0387
RES	0.1040	0.1021	1.0368	0.3086
REL	0.0134	0.1226	0.0120	0.9128

-2 Log Likelihood (Covariates)=520.2 (p=0.0001)

Age of mother at child birth appears to be negatively associated with the odds of having a subsequent birth. On the other hand, if marriage takes place relatively later then the likelihood of a birth increases. These results are evident from the DHS findings on the age at marriage and fertility patterns in Rajshahi, Khulna, and Chittagong Divisions (Islam and Zaman, 1995a,b). The women of Khulna and Rajshahi Divisions get married earlier and they experience childbirth at an early age (high teenage fertility). However, the use of contraception is the highest in these Divisions as well. In contrast, the women living in Chittagong Division get married at relatively higher ages but they have more children within a shorter span of time. The use of contraception is relatively lower in Chittagong Division. Hence, it appears from the study that an effective campaign for creating social awareness for discouraging teenage marriage and fertility along with a strong family planning programme can reduce the level of fertility to a large extent.

A large proportion of women reported that the index birth was not planned beforehand. This indicates the potential unmet need for contraceptives is still very high. It is observed from Table 5A that the women who planned to have the index child are 40 percent less likely to have an additional birth as compared to those who did not plan. A possible explanation is that those who plan for a child may have used methods of contraception for spacing or limiting births.

Among other factors, education of the respondent contributed substantially to the reduction of fertility. This contribution disappears after introducing variables for methods of contraception after PPA among women who have given birth to index children (Table 5B). However, women's education influences the decision making process affecting the health of mothers and children and can act as a catalyst for the reduction of fertility levels.

A woman with higher birth order for the index child is more likely to have an additional child. Number of deaths prior to the birth of index child indicates a slightly increased risk of having an additional birth ($p<0.10$). However, with the introduction of variables for methods of contraception, this variable appears to have no such association with an additional birth. This requires an extensive investigation in terms of the total number of births and the age-sex composition of children. In addition, the sex of the index child does not appear to have any significant role on the birth of an additional child in the presence of biological and behavioral factors.

Table 5B: Logistic Regression Estimates for Selected Covariates (Including Family Planning Variables)

Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square
INTERCEPT	0.3252	0.3194	1.0368	0.3086
Z1	1.5415	0.1320	136.2897	0.0001
Z2	0.6527	0.2864	5.1936	0.0227
TEMPM	-0.9666	0.0997	93.8990	0.0001
SEMIM	-0.8334	0.1653	25.4293	0.0001
TRADM	-0.5399	0.1509	12.8037	0.0003
MAGECB	-0.1121	0.0139	64.6961	0.0001
CSEX	-0.0405	0.0772	0.2751	0.5999
BORDR	0.1270	0.0419	9.1817	0.0024
AGEMAR	0.0614	0.0178	11.9696	0.0005
CNDD	0.0900	0.0778	1.3383	0.2473
WNT	-0.5325	0.1158	21.1480	0.0001
EDU1	-0.1238	0.0916	1.8281	0.1764
EDU2	-0.0255	0.1236	0.0425	0.8367
RES	0.1902	0.1043	3.3256	0.0682
REL	-0.0009	0.1243	0.0000	0.9945

- 2 Log Likelihood (covariates) = 679.9 (p= 0.0001)

Table 5B shows that family planning variables increase the explanatory power of the model by a large extent. The users of modern temporary methods are found to be most likely to avert births, compared to users of semi-permanent or traditional methods. The odds of having a child birth among users of temporary methods is little more than one-third of the level for a non-user, compared to more than two-fifths and three-fifths among users of semi-permanent and traditional methods respectively. The reason for lower effective use of semi-permanent methods as compared to modern temporary methods may be attributed to a higher rate of discontinuation of the semi-permanent methods resulting from a higher incidence of side-effects (MOHFW, 1994). The first-year discontinuation rate due to side-effects or health reasons for injection is 40 percent, compared to 26 percent for oral pills. Other reasons, such as desire for additional children and method failure, have similar rates of discontinuation for oral pill and injection.

Conclusion

If a child dies before resumption of menstruation, then the risk of having a birth increases greatly. The risk decreases to some extent if the index child dies after the PPA. In other words, if we could reduce the death of a baby before the resumption of menstruation or after the PPA then the likelihood of the next birth could be reduced to a large extent. However, the general fear of a child-loss appears to have a strong impact on subsequent fertility. This supports a general belief that there is a strong replacement effect operational in our society due to a very high prevalence of infant and child mortality. It is evident that the combined impact of biological and behavioral factors associated with infant/child mortality on fertility is large, and a well organized effort to reduce infant/child mortality can reduce the level of fertility substantially.

A reduction in infant/child mortality will result in a substantial decrease in the reduction of fertility. The biological effect of a child death during the postpartum amenorrhea period increases the likelihood of an additional birth by more than three times. Similarly the replacement effect can also be decreased by reducing the level of fertility. A child death may increase the likelihood of an additional birth by 1.7 times. Combining these effects we observe that a large proportion of women who do not want to have an additional child or want to delay their childbearing change their decision immediately after the death of a child. This finding alone has very important policy implications. For instance, if neonatal mortality can be reduced through adequate health measures before and after delivery of a child, then it will increase the subsequent birth interval substantially and the level of fertility will be reduced to a large extent. The reduction of deaths of infants and children will have the strongest impact.

It is noteworthy that the methods of family planning reduced the level of fertility to a considerable degree. A comparison among users of different types of methods demonstrates that after having a child, modern reversible methods are used most effectively. The high discontinuation rate of semi-permanent methods (injectables and IUDs), attributable mainly to side-effects, needs to be addressed by the government in order to achieve more effective use. In addition, there is a large proportion of unplanned births that can be reduced through: (i) special programmes to identify them, and (ii) implementing an effective family planning programme specifically designed for these groups.

The necessity of adequate education, particularly for women, appears to have significant contribution in reducing the level of fertility in addition to biological and behavioral responses. This has been identified by the government as a priority, but an immediate and effective programme in this regard can accelerate the process of fertility decline at a much faster rate.

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Table 1: Background Characteristics of Subsequent Birth Intervals

Variables	Frequency	Percent
AGECB (years)		
<18	1267	14.9
18-24	4004	47.2
25-29	1718	20.2
30 or higher	1497	17.6
URBAN		
Urban	1110	13.1
Rural	7376	86.9
EDUL		
No schooling	4929	58.1
Primary	2378	28.0
Secondary	1025	12.1
College or higher	154	1.8
EDULH		
No schooling	4043	48.0
Primary	2040	24.2
Secondary	1025	12.1
College or higher	624	7.4
RELIGION		
Muslim	7558	89.1
Other religions	928	10.9
Number of Children Died		
0	5152	60.7
1	2118	25.0
2 or more	1216	14.3
Birth Order		
1	2069	24.4
2	1853	21.8
3	1427	16.8
4	977	11.5
5 or higher	2160	25.5
Subsequent Birth Interval (months)		
<24	2225	30.4
24-35	2177	29.7
36-47	1475	20.1
48 or higher	1450	19.2

Table 1 (Continued)

Variables	Frequency	Percent
Previous Birth Interval (months)		
<24	1372	21.6
24-35	2130	33.6
36-47	1383	21.8
48 or higher	1462	23.0
Survival Status of the Index Child		
Survived	7553	89.0
Died	933	11.0
Sex of the Index Child		
Male	4297	50.6
Female	4189	49.4
Postpartum Amenorrhea (months)		
<3	4709	55.5
3-5	847	10.0
6-17	2165	25.5
18 or higher	765	9.0
Planned to have the Index Child		
No	4004	47.2
Yes	4482	52.8
Birth Cohort		
1988	1354	16.0
1989	1596	18.8
1990	1561	18.4
1991	1363	16.1
1992	1235	14.6
1993	1285	15.1
1994	89	1.0
Index Birth Interval Ended with Another Birth		
Yes	2833	33.4
No	5653	66.6
Status and Duration of Use of Contraception (months)		
Non-use	4523	53.3
1-5	834	9.8
6-11	652	7.7
12-17	565	6.7
18 or higher	1911	22.5

Table 1 (Continued)

Variables	Frequency	Percent
Z1		
0	4818	90.4
1	509	9.6
Z2		
0	5250	98.6
1	77	1.4

Table 3: Median Subsequent Birth Intervals for Selected Covariates

Variables	Median (months)	Log-Rank Chi-Square (p-value)
Birth Order		
1	42.0	99.27
2	47.0	(0.0001)
3	48.4	
4	53.3	
5 or higher	64.3	
Age at Birth of the Index Child		
<18	42.1	165.28
18-24	45.2	(0.0001)
25-29	51.3	
30 or higher	-	
Place of Residence		
Rural	47.9	5.09
Urban	54.4	(0.0241)
Duration of Breastfeeding (months)		
0	28.3	754.08
1-5	33.6	(0.0001)
6-11	24.6	
15-23	31.9	
24 or higher	-	
Education Level of Respondent		
No schooling	46.2	35.26
Primary	50.7	(0.0001)
Secondary	56.9	
College or higher	62.7	
Birth Cohort		
1988	42.2	103.5
1989	47.8	(0.0001)
1990	47.9	
1991	-	
1992	-	
1993	-	
1994	-	
Number of Children Died		
0	50.2	38.06
1	43.1	(0.0001)
2 or more	50.8	

Table 3 (Continued)

Variables	Median (months)	Long-Rank Chi-Square (p-value)
Survival Status of the Index Child		
Survived	51.4	363.19
Died	29.7	(0.0001)
Postpartum Amenorrhea (months)		
<3	36.6*	385.19
3-5	31.3*	(0.0001)
6-11	30.4*	
12 or more	50.0*	
Status and Duration of Use of Contraception (months)		
Non-user	33.6	1806.1
1-5	39.6	(0.0)
6-11	41.8	
12-17	50.0	
18 or more	-	
Z1		
0	48.8	82.3
1	31.1	(0.0001)
Z2		
0	48.7	6.3
1	41.4	(0.01)

Note: (-) These estimates could not be obtained due to heavy censoring.

CHAPTER II

REPRODUCTIVE HEALTH PROGRAM PERFORMANCE

Characteristics of Family Planning Service Utilization and Source of Supply in Bangladesh

AKM Rafiquz Zaman, Jahir Uddin Ahmed, Andrew Kantner

Introduction

The Bangladesh family planning program has achieved considerable success since the country gained its independence in 1971. The contraceptive prevalence rate (CPR) increased from 3.7% in 1967-69 to 44.6% in 1993/94. Over this time, the channels for providing services to clients have changed considerably. Clinical service provision, which was the principal source of supply in the early years of the program, has given way to a delivery system typified by fieldworker service delivery and, to a lesser extent, social marketing outlets. More recently, renewed efforts have been made to strengthen clinical service provision, especially through a newly formed network of satellite clinics being established throughout the country.

This report will examine trends in the source of supply for the main contraceptive methods in the Bangladesh family planning program over the period 1983-1993/94 using information from the 1993/94 Bangladesh Demographic and Health Survey. In addition, patterns of use effectiveness and indicators of service quality will be assessed by source of supply. Prior to the presentation of this information, a brief overview of the Bangladesh family planning program will be provided that traces the evolution of clinical and non-clinical services since the inception of family planning activities in 1953.

A Brief History of Family Planning Efforts in Bangladesh

Organized family planning efforts began in Bangladesh in 1953 with the creation of Family Planning Association, which later became an affiliate of the International Planned Parenthood Federation (IPPF). Since then, family planning activities have gone through eight distinct stages.

Phase 1: Voluntary Effort (1953-1960)

The Bangladesh Family Planning Association (BFPA) was created as a non-profit national voluntary service delivery organization. The major achievement of the BFPA was to focus public attention on population and family planning issues and encourage greater government involvement in this sector.

Phase 2: Clinic-based Government Program (1960-1965)

During this phase, all government clinics and hospitals at the thana level were provided with conventional contraceptives (condoms, diaphragm, jelly). However, this effort could not achieve its initial objectives since (1) not enough medical personnel were trained to provide family planning

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services, and (2) efforts to educate and motivate clients to use clinic-based services were not effective. In addition, training and research centers were established in Dhaka, Rajshahi and Chittagong for training paramedics in family planning. Social workers trained in family planning issues were also appointed at the district level to assist in organizing motivational meetings in the field.

Phase 3: Field-based Family Planning Program (1965-1971)

In this phase, emphasis was given to mobilizing community support for family planning by creating the Directorate of Family Planning. In each district, a District Executive cum Publicity Officer, District Family Planning Officer and District Technical Officer were appointed. In addition, one Thana Family Planning Officer and one Lady Family Planning Visitor (LFPV) at the thana level were appointed. At the field level, one part-time dai per 2,000 population and one part-time Chief Male Organizer (CMO) at the union level were engaged.

Attention was also given to promoting the use of IUDs and vasectomy. Provision was made for the awarding of cash incentives for both referrers and acceptors of clinical contraception. In addition, fees were paid to doctors for carrying out vasectomies and lady health visitors and lady family planning visitors for IUD insertions. However, these initiatives encountered problems owing to (1) lack of training facilities for providers, (2) side effects and high discontinuation rates for the IUD, and (3) management problems associated with referrer and provider payments for clinical services (e.g., inflated reporting of performance levels).

Phase 4: Integrated Health and Family Planning Program (1972-1974)

Over the period 1972-74, the country was unstable owing to the War of Independence and the needs of massive rehabilitation. However, the first Five Year Plan (covering the years 1973-78) was formulated. In addition, financial incentives to referrers and acceptors of clinical contraception were stopped. Part-time dais and male family planning "organizers" were also phased-out of the program. This period was also notable for the introduction of oral pills in Bangladesh and the initiation of limited maternal and child health interventions.

Phase 5: MCH-based Multi-Sectoral Program (1975-1980)

The MCH-based Multi-Sectoral Program was launched toward the close of 1975. To give more emphasis to family planning, a separate family planning wing was created in the Ministry of Health. A National Population Council, headed by the Prime Minister, was also formed. At the field level, full-time Family Welfare Assistants (FWAs) were appointed at the ward level to replace part-time dais. In addition, one Family Planning Assistant (FPA) was appointed in each union in order to replace the Chief Male Organizer (CMO). The post of thana Technical officer/Medical officer (MCH-FP) was created at thana level and were made available mostly from Directorate of Health Services on deputation. In each Family Welfare Center the post of Medical Assistant and Family Welfare Visitor were created.

Contraceptive targets were set in terms of the percentage of women in the age group 15-49 expected to adopt individual methods (25 percent for pills, 20 percent for the IUD, 20 percent for sterilization,

and 35 percent for condoms and traditional methods). In addition, the first national population policy was announced by the Government of Bangladesh in June, 1976. Specific measures proposed as part of the multi-sectoral initiative included the following:

(1) Intensive educational efforts through the use of mass media and local indigenous communication;

(2) Enlisting community involvement in planning and implementing the family planning program;

(3) Involving women, youth, religious groups and voluntary organizations in the generation of social support for family planning;

(4) Re-introducing incentives and disincentives aimed mainly at clients and service providers;

(5) Promoting local measures aimed at increasing the age at marriage, compulsory primary education, and the liberalization of abortion.

Phase 6: Functionally Integrated Program (1980-1985)

During the implementation of the MCH-based Multi-Sectoral Program, additional initiatives were undertaken to intensify program infrastructure and service provision. More fieldworkers (providing health and family planning services) were trained, thana-level clinics - Family Welfare Centers - were expanded and rural dispensaries were upgraded. NGO provision of family planning services also grew substantially. Efforts were also made to more effectively integrate health and family planning program services by merging separate health and population control divisions into a new "unified" Ministry of Health and Family Welfare. In addition, strong national political support for family planning was sustained during this period; for example, through reconstituting the National Population Council (headed by the President of Bangladesh).

Phase 7: Intensive Family Planning Program (1985-1990)

Efforts to further intensify the family planning program were initiated during this period. An additional 10,000 fieldworkers (FWAs) were trained and fielded in order to further the goal of having one fieldworker per 5,000 population. To strengthen field supervision one post of Assistant Family Planning Officer and to supervise MCH activities at FWC and field one post of Senior Family Welfare Visitor were created. The upazila system was initiated that provided greater support for the family planning program, including the promotion of greater community involvement. Three women's programs (the Social Welfare-Mother's Clubs (BRDB), Cooperatives and Women's Affairs, and Vocational Training of Women) were begun to enhance the status of women in Bangladesh. A nationwide couple registration was undertaken in order to better demarcate FWA catchment areas. Finally, FWA registers and record-keeping formats were also simplified during this period.

Phase 8: Participatory MCH/Family Planning Program (1990-1995)

In recent years, the Bangladesh family planning program has made further efforts to intensify the delivery of family planning and MCH services, launch new nutrition programs for mothers and children, involve more women in income-generating activities, and mobilize greater community support through different projects (e.g., the Local Initiative Project (LIP), Shwanivar program, etc.) and involvement in MCH and family planning services. Family planning workers were instructed to work for supportive activities entitled "Family Planning Plus" to establish close linkage with communities to enhance family planning performance.

At the present time, the program is considering new initiatives to enhance the accessibility and quality of clinical services, and expand the range of reproductive health interventions supported by the program (e.g., treatment of reproductive tract infections and sexually transmitted diseases)[1]. This period also saw the introduction of clinical trials for Norplant, which has now become an official family planning method in the Bangladesh family planning program.

Patterns of Family Planning Service Utilization between 1983 and 1993/94

Since 1983, the Bangladesh family planning program has become increasingly reliant on fieldworker-delivered methods. Oral pills have become the most prominent method in the program. As can be seen in Table 1, 70.8 percent of all pill users obtained their supplies from fieldworkers (GOB and NGO) in 1993/94, an increase from 37.3 percent in 1983. Since 1989, the percentage of clients obtaining pills from the Social Marketing Company fell from 34.5 percent to 19.8 percent, while the relative share of clinic-delivered pill users remained relatively constant.

Rural pill users have become far more dependent upon fieldworkers in recent years. As can be seen in Table 2, 73.9% of rural residents obtained pills from fieldworkers in 1993/94, as compared to 44.4% in 1983. Table 2 also reports a substantial jump in the percentage of pill users with limited mobility status (not allowed to travel to clinics alone or with family members) and no education who rely upon fieldworkers for services. These findings suggest that fieldworkers are reaching poorer, less advantaged clients that might otherwise be deprived of provider contact.

The extent to which the Bangladesh family planning program is currently dependent upon fieldworkers is underscored by the rapid growth in domiciliary-delivered injectable contraception. Between 1989 and 1993/94, the percentage of clients that obtained injectables from fieldworkers increased from 18.8% to 36.3% (Table 1). As can be seen in Table 3, urban areas have experienced the most rapid gain in the percentage of clients utilizing fieldworker-provided injectables (rising from 6.4% to 32.3% of total urban injectable users between 1989 and 1993/94). This growing reliance on fieldworkers is largely responsible for the rapid expansion of injectable contraception since 1989.

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1. For a more thorough review of the history of the Bangladesh family planning program, see Syed Jahangeer Haider, Kim Streatfield, and Muhammad Azizul Karim, Comprehensive Guidebook to the Bangladesh Family Planning-MCH Program, (Dhaka: Research Evaluation Associates for Development, the Population Council, and the Ministry of Health and Family Welfare, no date).

Greater reliance is placed upon "door-step" injectable services when clients were visited by fieldworkers two or three times within the previous six months. For example, in 1993/94, when fieldworkers visited clients at least twice in the past six months, 55.7% of injectable users relied upon fieldworker provided services. If clients were only visited once, the percentage of injectable users supplied by fieldworkers fell to 26.5%, and no visitation in the previous six months resulted in only 14.9% of clients depending upon door-step injectable delivery. Clearly, more frequent visitation by fieldworkers produces greater utilization of domiciliary-based services. Two or three fieldworker visits every six months appears more optimal than just one bi-annual visit.

Fieldworkers also appear especially effective in providing injectables to women with limited social mobility. Between 1989 and 1993/94, women who reported that they could not travel alone to clinics became more reliant on fieldworkers (15.5% of these women relied upon fieldworkers for injectable services in 1989 and 47.5% in 1993/94).

The source of supply for condoms has not changed appreciably since 1983. Over the past decade, social marketing outlets supplied by the Social Marketing Company (SMC) have remained the most likely service points, followed by fieldworkers and clinics. Younger women (aged 15-24), women residing in urban areas, and more educated women are more likely to employ condoms purchased (often by their husbands) from SMC outlets (see Table 4).

Clinical family planning methods, primarily IUDs and sterilization, have not experienced the rapid gains in use that have been noted for fieldworker-delivered methods. Over the period 1983-1993/94, the annual rate of growth in the use of non-clinical family planning methods was 14.8%, while it was only 6.3% for clinical methods.

Voluntary sterilization has been a prominent component of the national family planning program since the mid-1960s. Beginning in the mid-1970s, annual sterilization performance continuously increased, peaking in 1983/84 at 552,167 acceptors. Since then, however, performance has declined. By 1994/95, the number of sterilizations performed had dropped to 70,642 (the lowest number since 1979-80).

Factors Responsible for the Low Use of Clinical Contraception

A number of factors have been cited in recent years for the low use of clinical contraception (especially IUD and sterilization performance) in the Bangladesh family planning program. Some of the more prominent factors are the following:

1. The Strengthening of Community-Based Service Delivery in Bangladesh

During the last decade, both GOB and NGO family planning programs have strengthened their community-based service delivery systems by recruiting and deploying over 23,500 fieldworkers (10,000 GOB and 13,000 NGO). These workers have been assigned specific catchment areas. They are required to make bi-monthly home visits to their clients in order to promote the use of contraception and provide supplies of oral pills and condoms.

Community-based outreach has been augmented by the establishment of satellite clinics in which Family Welfare Visitors (FWVs) provide injectables and other methods every month at 8 outlying

locations in each union. It is therefore not surprising to see that pill and injectable use have increased in recent years.

2. Deficient Supply of Services

The provision of long-acting methods remains deficient for a number of reasons:

a. There is inadequate capacity for sterilization training in Bangladesh. Many personnel have not received refresher training. Moreover, skill training is largely theoretical, with little opportunity to be trained in practical aspects of service delivery (e.g., having contact with clients during training).

b. Since fieldworkers and other staff are often aware of the deficiencies in the competancy of clinical providers, they are sometimes reluctant to refer clients for IUD insertions and sterilization procedures.

c. Many doctors assigned to the Family Planning Directorate are on deputation from the Health Directorate and do not have career advancement opportunities in the FP Directorate. As a result, their level of initiative and interest is sometimes questioned and ownership and commitment to family planning is not satisfactory.

d. Many service sites lack adequate equipment (e.g. autoclave, kerosine, essential drugs, etc.) which helps account for the relatively low utilization levels at some facilities. In addition, minor clinic supplies are often not obtained due to the non-availability of local funds.

3. Erosion in the Medical Quality of VS and IUD Services

Owing to the lack of adequate skill training and supervision, the infection rate among VS and IUD clients is believed to have risen, possibly resulting in an increase in the number of sterilization-related deaths. This harms confidence in the method among both field staff and the public. While this decline in quality does not fully account for the overall reduction in sterilization since the mid-1980s, it is probably a contributing factor that must be aggressively corrected. Non-availability of different types of IUDs in all service center at a time created problem for the clients choosing suitable types of IUDs.

4. Elimination of Fees for IUD and Sterilization Referrals

Until 1988, field functionaries (GOB and NGO as well as ad hoc agents) received referral fees to cover conveyance costs for accompanying VS and IUD clients to clinics. However, there were reports of abuse of the system, especially by the agents (dalal). Since the abolition of the fees, GOB and NGO fieldworkers have been reluctant, if not unable in some cases, to spend money out of their own pockets to take clients to clinics. Female clients usually do not travel alone to thana health complexes; even male clients have often been accompanied for vasectomies. The absence of travel funds is believed to have been reducing the utilization of IUD and sterilization services.

5. Inflationary Erosion of the Value of Client Compensation

Client compensation is meant to offset wage loss, to defray the cost of the client's travel to and from the clinic, and to enable female clients to meet the cost of food for herself and attendants while at the clinic. However, with rising inflation and increasing wage levels, the real value of client compensation has declined.

6. Introduction of Injectables and Norplant

The introduction of longer-term methods such as injectables and Norplant have been perceived by some clients as attractive substitutes for IUDs and sterilization, thereby possibly reducing client demand for these methods.

The low levels of clinical contraceptive use indicates that methods with high levels of use effectiveness are under represented in the program at the present time. Non-clinical methods (e.g., pills and condoms), while having high theoretical effectiveness, often are associated with relatively low use effectiveness (i.e., women don't use these methods correctly or have high rates of discontinuation). Therefore, a program typified by a method mix with low use effectiveness cannot efficiently serve the reproductive health needs of clients.

Measures of Contraceptive Use Effectiveness for Non-Clinical Methods by Source of Supply

Two broad measures of use effectiveness are considered in this study; namely, use compliance (the correct use of a method by clients) and method failure. These characteristics are sub-classified by service point in order to determine whether use effectiveness is partly conditional upon where clients obtain services.

Use Compliance for Oral Pills, Injectables, and Condoms

In the 1993/94 BDS., use compliance information was collected for oral pills, injectables and condoms. Women are considered to be compliant users of pills if they (1) had not forgotten to take a pill at least three days prior to interview, (2) could show their pill packets, and (3) had removed pills from their packets in the proper order. Injectable compliance is measured by whether women had an injection within three months of interview. Condom compliance is assessed by whether the respondent could produce a package of condoms at the time of interview (which is clearly not a totally adequate compliance measure).

As can be seen in Table 5, compliance is very high for injectables. Nearly all women report having had an injection three months prior to interview. There is also no discernable variation in compliance by service point. If these results are reliable, then Bangladesh has attained a remarkably high level of injectable compliance. However, pill and condom compliance is considerably lower.

In the 1993/94 BDHS only 81.3 percent of current pill users are compliant. Women are more likely to use pills correctly if they obtained services from clinics rather than fieldworkers and commercial channels (SMC). However, differences in compliance by service point are not large and, to a

considerable extent, can be accounted for by sampling error. However, pill use compliance measured at the divisional level (shown in Table 6) does suggest that women in Chittagong are less likely to use pills correctly if they were obtained through commercial channels rather than clinics or fieldworkers.

At the national level, only 68 percent of condom users could produce a package of condoms. Women who reported commercial channels (SMC) as their source of supply were least likely to be compliant. However, since women's ability to produce a package of condoms is a very inexact measure of compliance, it is not clear whether differences by service point are especially meaningful.

Method Failure for Modern Methods

An additional measure of use effectiveness is whether clients become pregnant while using a method. In general, family planning programs with low use compliance should be expected to high failure rates. In the 1993/94 Bangladesh BDHS, this does not appear to be the case.

Method failure is computed in the 1993/94 BDHS as the percentage of women who discontinued using a method after accidentally becoming pregnant. Table 7 shows the percentage of clients who discontinued their most recent method of use at some time point in the past. Since these estimates are not based upon 12 month life-table measures of discontinuation, they must be interpreted with some caution. However, it does appear that users of clinic services are less likely to discontinue using most methods (especially pills) than clients served by fieldworkers and commercial channels (SMC).

In Table 8, reasons for discontinuing any modern method during the most recent segment of use are presented. The percentage of women who cite method failure as a reason for discontinuing is remarkably low. Only 6.9 percent of women who discontinued said that they had become accidentally pregnant while using. Method failure appears to be somewhat lower among women who obtained services from fieldworkers rather than through commercial channels and clinics. However, owing to the small number of failure cases reported by service point (clinic = 40, SMC=55 , and fieldworker = 75) these variations may not be very meaningful.

In general, levels of method failure as reported in the 1993/94 BDHS are surprisingly low by international standards. For example, the first year user failure rate for oral pills is only 1.7 percent (Mitra, et al., 1994:61) even though just 81.9 percent of pill users are compliant. In the 1994 Indonesian DHS, oral pill compliance is 90 percent (8 percentage points higher than Bangladesh) and first year oral pill failure is 5.0 percent (considerably higher than reported for Bangladesh). Clearly, the issue of contraceptive user failure, and the overall effectiveness of the Bangladesh family planning program, requires additional study.

Women's Mobility Status and Choice of Method and Service Point

Findings from the 1993/94 BDHS also show the importance of women's physical mobility as a factor influencing the choice of methods and service point. As can be seen in Table 9, women who say they cannot travel alone to a health facility (17.9 percent of currently married women in the 1993/94 BDHS) are more dependent upon fieldworker delivered methods (pills and condoms). For example, injectable prevalence among women with restricted mobility is 2.4 percent compared to 6.0 percent

for women who can travel easily to a health facility. This pattern is even more pronounced for sterilization users. Sterilization prevalence among women not able to travel to a health facility is only 4.0 percent as opposed to 10.8 percent among women with unrestricted mobility.

The importance of women's physical movement can also be seen when comparing mobility status with choice of service point (see Table 10). Among women who can travel alone or with family members, 36.9 percent obtain services from clinics compared to only 19.2 percent of women with restricted mobility. Women who cannot travel easily to clinics are clearly more reliant upon home-based service delivery.

A major unanswered question facing the Bangladesh family planning program is whether women with restricted physical mobility will make greater use of clinical services in the future, especially if the home delivery of services by fieldworkers becomes a less prominent feature of the program.

Patterns of Referral for Clinical Services in Bangladesh

A major factor for the relatively low utilization of clinical services at the present time is the low level of referral to clinic sites by fieldworkers. As can be seen in Table 11, only 6.8 percent of current family planning users have been referred for clinical services.

The lowest referral level is in Dhaka (5.0 percent) and the highest in Khulna/Barisal (9.5 percent). If clinic service utilization levels are to be raised significantly, fieldworker referral levels will need to be increased in future years.

At the present time, most clinic referrals by fieldworkers are for injectables (30.0 percent) and IUDs (28.1 percent). Table 12 shows that the sterilization referral level (14.7 percent) is now roughly 50 percent lower than for IUDs and injectables. Dhaka Division appears to have exceptionally low fieldworker referral for sterilization (7.3 percent), although the small number of cases of referral by division may make this conclusion somewhat unreliable. Table 12 also indicates that fieldworkers direct 17.2 percent of referral cases to clinics for the treatment of health problems (side effects and other health problems).

An important dimension of the Bangladesh family planning program that will need attention in future years is the low level of post-partum counseling and service provision made available to new mothers. Information provided in Table 13 shows that only 21.3 percent of mothers obtain any family planning advice soon after giving birth. Very few mothers currently obtain any post-partum family planning counseling from doctors and nurse/midwives, which is largely indicative of the fact that most women have their children at home rather than in clinics or hospitals and usually do not obtain medical-based post-natal care. Mothers say that fieldworkers are currently the main source of information about family planning rather than medical staff responsible for providing post-natal care (see Table 13). As the network of Maternal and Child Welfare Centers are expanded in future years, one requisite quality enhancement will entail the provision of more systematic counseling on family planning and reproductive health by medical providers of post-natal care.

Characteristics of Satellite Clinic Service Provision

In recent years, efforts have been made to make clinic services more accessible to clients by holding satellite clinics on certain days every month in local village communities. The 1993/94 BDHS obtained information from 584 Family Welfare Visitors (FWVs) concerning the holding of satellite clinics in their coverage areas. FWVs report holding an average of between 7.0 (Dhaka Division) and 7.9 (Khulna/Barisal Division) satellite clinic sessions per month (see Table 16). The average number of clients seen by FWVs in a week (at both Family Welfare Centers and satellite clinics) ranges between 38 (Chittagong Division) and 46 (Dhaka Division). According to the 1993/94 BDHS, the number of clients served per week by fieldworkers ranges from 32 (Chittagong) to 48 (Khulna and Rajshahi) - based upon an average of 4 days per week doing home visitation. So, at the present time, one fieldworker is serving roughly as many clients per week as one FWV. System-wide, there are currently 4,684 FWVs and 35,000 fieldworkers (23,000 government and 12,000 NGO) in the Bangladesh family planning program.

Table 15 presents problems reported by FWVs in conducting satellite clinics in their localities. The biggest problem faced by FWVs is finding a suitable place to hold the satellite clinic (mentioned by 23.5 percent of FWVs interviewed). Finding a suitable place appears to be a bigger problem in Rajshahi than in Chittagong. FWVs in Rajshahi are also more likely to report problems finding a suitable environment to see patients and provide services (mentioned by 11.4 percent of FWVs in Rajshahi compared to only 3.2 percent in Barisal/Khulna). Insufficient equipment and inadequate supplies of medicine are also cited as problems by some FWVs (8.9 percent and 7.4 percent respectively). However, it is encouraging to note that the majority of FWVs do not report any major problems in holding satellite clinics.

Recommendations

Based upon the authors experience in the Bangladesh family planning program and, in part, upon the findings of this study, the following recommendations can be made for strengthening reproductive health service delivery and the utilization of clinical contraception, in Bangladesh

1. Consideration should be given to having some FWAs provide injectables at satellite clinics on certain days each month rather than providing door-step delivery and assess whether client utilization is compromised or enhanced;

2. Physicians/doctors and FWVs should be encouraged to provide more systematic post-partum family planning counseling to mothers;

3. Steps should be taken to ensure that satellite clinics are properly equipped with necessary facilities for providing injectables and IUDs on demand;

4. The Social Marketing Company (SMC) should consider ways of improving the correct use of pills and condoms distributed through commercial channels. This study found that use compliance for SMC-delivered pills in Chittagong was especially low. Future commercial advertising and IEC campaigns for pills and condoms should contain brief but essential information on the correct use of methods;

5. More private practitioners should be trained to provide injectable contraception, IUDs, and sterilization services;

6. Service providers (government and NGO) should encourage greater use of clinical contraception by improving counseling services and ensuring effective referral to clinic-based service providers;

7. Consideration should be given to utilizing Maternal and Child Welfare Centers (MCWCs) for the provision of female sterilization services and the management of contraceptive side-effects (both clinical and non-clinical methods);

8. Male outreach workers (FPIs, AHIs, and MHAs) should be deployed in certain localities on a trial basis to inform husbands about their reproductive health needs and options. In addition, male workers should attempt to popularize male sterilization and condom use;

9. Special training should be instituted to improve counseling abilities among FPIs, FWVs, FWAs, and NGO workers to minimize discontinuation and use failure among oral pill, IUD, and injectable clients;

10. Community leaders at the thana level should be given orientation instruction on modern and traditional family planning methods, with particular emphasis on clinical methods, sources of supply, and referral systems;

11. An operational research study should be developed that will identify mechanisms for promoting greater clinic service utilization by women with restricted physical mobility (e.g., by having FWAs undertake special visitation schedules one week each month);

12. A special reward system for clinical method providers should be established in each thana, to be given every year to outstanding family planning workers and Union Parishad chairman/ members who have been especially supportive of family planning activities;

13. An experimental study should be undertaken that assesses the utility of monthly meetings between satisfied family planning users and non-users (which could be organized at FWCs, Satellite Clinics, MCWCs, and Thana Health Complexes);

14. Views and comments of satisfied users of clinical contraception should be broadcast on radio and television to help motivate and reassure potential new users of these methods;

15. IEC programs should cover all family planning methods with equal emphasis in publicity materials and on radio and television (at particular times on certain days);

16. It may be worthwhile to consider observing a clinical-method IEC program week every year in order to promote more effective contraceptive methods and increase the use of clinical facilities;

17. Filling-up vacancies of doctors, providing more comprehensive training for doctors on clinical methods including reproductive health aspects, and develop more career-building opportunities for medical and clinical staff may enhance competence building and manpower development;

18. The Directorate of Family Planning should have their own physicians with adequate authority to perform their duties as providers of quality reproductive health and clinical family planning service;

19. Fieldworkers should make planned visit (segmented couples) instead of routine visit (20 households per day.

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Table 1: Choice of Service Points of Different Family Planning Methods1983-94

Method	1983				1989				1993-94			
	N	Clinic	SMC	FWA	N	Clinic	SMC	FWA	N	Clinic	SMC	FWA
Oral Pill	234	10.2	52.5	37.3	1020	16.7	39.4	43.9	1544	9.4	19.8	70.8
Injectable	17	90.2	7.8	2.0	73	80.6	0.7	18.8	404	62.9	0.8	36.3
Condom	86	13.7	56.2	30.1	180	8.1	60.4	31.5	253	6.4	56.2	37.4

Source: CPS 1983, BFS 1989, BDHS 1993-94

Table 1a: Choice of Service Points (Clinical) of FP Methods 1993-94

Method	N	Characteristics of Clinic				All Clinics
		FWC	SC	THC	Other	
Reversible Methods:						
Oral Pill	1544	3.9	0.1	0.7	4.7	9.4
Injectable	404	30.9	12.6	7.1	12.4	62.9
Condom	253	3.3	0.0	0.6	2.5	6.4
Clinic Only Methods:						
IUD	196	46.3	3.6	18.6	18.8	87.3
Sterilization	815	16.7	0.7	40.7	41.8	99.9

Source: BDHS 1993-94

Table 2: Choice of Service Points of Oral Pill According to Background Characteristics (National)

CHARACTERISTICS	1983			1989			1993-94		
	CLINIC	SMC	FIELD WORKER	CLINIC	SMC	FIELD WORKER	CLINIC	SMC	FIELD WORKER
A. RESIDENCE									
Rural	11.7	43.8	44.4	17.2	38.0	44.8	9.0	17.1	73.9
Urban	6.8	72.0	21.3	14.0	47.3	38.6	12.0	37.3	50.7
B. AGE									
<25	7.9	56.4	35.7	19.0	41.6	39.4	10.6	25.3	64.1
25-34	13.2	51.9	34.9	14.3	40.8	44.9	9.8	16.9	73.3
35+	9.0	43.0	48.0	17.6	29.8	52.6	6.3	16.5	77.3
C. PARITY									
0	-	80.2	19.8	18.6	52.0	29.3	-	-	100.0
1	12.5	52.7	34.8	18.2	37.9	43.9	10.2	22.7	67.1
2	9.8	60.1	30.1	17.6	42.3	40.1	9.7	23.0	67.2
3	4.4	54.2	41.3	13.1	43.6	43.3	7.7	17.6	74.7
4+	12.2	45.8	42.0	16.9	34.6	48.5	9.9	13.5	76.6
D. EDUCATION									
No education	12.4	30.1	57.4	18.1	32.2	49.8	8.4	10.4	81.2
Primary incomplete	6.7	53.8	39.5	15.4	33.7	17.7	11.4	19.6	69.0
Primary complete	8.8	67.1	24.1	13.7	43.2	43.1	8.9	39.9	51.2
Secondary/higher	10.6	73.7	15.7	16.6	55.2	28.2	7.9	52.8	39.3
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS									
Yes	7.9	33.2	58.9	11.1	28.4	60.4	5.2	12.0	82.8
No	12.5	72.2	15.3	26.9	59.2	13.9	24.7	47.8	27.5
F. NUMBER OF VISITS BY FIELD WORKER IN LAST 6 MONTHS									
0	-	-	-	26.9	59.2	13.9	24.6	47.8	27.5
1	-	-	-	11.3	31.7	57.0	10.6	23.6	65.8
2	-	-	-	13.7	23.3	62.9	5.3	12.2	82.4
3	-	-	-	6.8	19.4	73.8	3.9	9.0	87.2
4+	-	-	-	14.6	61.5	23.9	4.7	11.2	84.1
G. ALLOWED TO VISIT HEALTH CARE FACILITIES									
Allowed to go alone	-	-	-	18.7	42.4	39.0	9.9	19.0	71.1
Not allowed to go alone	-	-	-	16.3	38.7	45.1	6.7	21.3	72.1

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 3: Choice of Service Points of Injectable According to Background Characteristics (National)

CHARACTERISTICS	1983			1989			1993-94		
	CLINIC	SMC	FIELD WORKER	CLINIC	SMC	FIELD WORKER	CLINIC	SMC	FIELD WORKER
A. RESIDENCE									
Rural	91.7	8.3	-	78.7	-	21.3	62.3	0.9	36.8
Urban	86.7	6.7	6.7	89.3	4.3	6.4	67.7	-	32.3
B. AGE									
<25	58.1	41.9	-	80.2	-	19.8	71.7	0.9	27.4
25-34	96.4	3.6	-	78.1	0.8	21.1	57.9	1.2	41.0
35+	93.2	-	6.8	87.5	2.1	10.4	63.0	-	37.0
C. PARITY									
0	-	-	-	100.0	-	-	-	-	-
1	100.0	-	-	60.0	-	40.0	60.1	-	39.9
2	100.0	-	-	85.7	-	14.3	68.8	2.5	28.7
3	43.6	56.4	-	90.2	-	9.8	59.6	-	40.4
4+	97.5	-	2.5	80.6	2.1	17.3	62.3	0.8	36.9
D. EDUCATION									
No education	95.3	4.7	-	83.2	1.4	15.4	60.5	0.9	38.7
Primary incomplete	73.3	19.8	6.9	72.7	-	27.3	69.0	0.9	30.1
Primary complete	100.0	-	-	75.0	-	25.0	60.3	-	39.7
Secondary/higher	100.0	-	-	86.4	-	13.6	100.0	-	-
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS									
Yes	78.9	15.7	5.4	77.6	-	22.4	54.2	-	45.8
No	96.8	3.2	-	86.3	2.1	11.6	82.4	2.6	14.9
F. NUMBER OF VISITS BY FIELD WORKER IN LAST 6 MONTHS									
0	-	-	-	86.3	2.1	11.6	82.5	2.6	14.9
1	-	-	-	72.7	-	27.3	73.5	-	26.5
2	-	-	-	87.2	-	12.8	44.3	-	55.7
3	-	-	-	86.5	-	13.5	56.2	-	43.8
4+	-	-	-	36.7	-	62.3	56.8	-	43.1
G. ALLOWED TO VISIT HEALTH CARE FACILITIES									
Allowed to go alone	-	-	-	72.5	-	27.5	63.4	0.6	36.0
Not allowed to go alone	-	-	-	83.7	1.0	15.3	48.9	3.6	47.5

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 4: Choice of Service Points of Condom According to Background Characteristics (National)

CHARACTERISTICS	1983			1989			1993-94		
	CLINIC	SMC	FIELD WORKER	CLINIC	SMC	FIELD WORKER	CLINIC	SMC	FIELD WORKER
A. RESIDENCE									
Rural	14.5	50.9	34.5	8.2	62.2	29.6	5.8	53.3	40.8
Urban	12.2	65.6	22.2	8.0	55.8	36.2	7.6	62.7	29.7
B. AGE									
<25	9.2	64.0	26.8	9.1	70.1	20.8	7.0	65.1	27.9
25-34	20.6	50.1	29.3	7.3	55.9	36.9	5.7	45.9	47.5
35+	8.9	51.4	39.7	7.8	46.9	45.3	4.9	59.4	35.7
C. PARITY									
0	9.0	63.9	27.1	2.0	90.9	7.1	-	100.0	-
1	7.4	72.7	19.9	14.7	53.3	31.9	7.9	62.6	29.5
2	17.6	59.0	23.4	3.6	59.9	36.5	11.3	47.0	41.6
3	19.1	44.8	36.1	14.1	49.6	36.3	5.6	54.3	40.1
4+	13.1	50.1	36.8	6.6	56.6	36.8	2.3	48.8	49.0
D. EDUCATION									
No education	7.1	50.0	42.9	7.9	53.7	37.9	5.2	49.2	45.6
Primary incomplete	7.8	39.8	52.4	9.4	55.5	35.1	1.3	49.6	49.1
Primary complete	8.5	87.2	4.3	8.1	65.5	26.5	10.4	62.5	27.1
Secondary/higher	21.9	59.8	18.3	7.5	65.1	27.5	7.9	64.3	27.8
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS									
Yes	14.6	38.1	47.2	9.5	45.9	44.7	4.1	36.7	59.3
No	12.1	87.9	-	6.1	82.0	11.9	9.9	85.7	4.5
F. NUMBER OF VISITS BY FIELD WORKER IN LAST 6 MONTHS									
0	-	-	-	6.1	82.0	11.9	9.8	85.7	4.5
1	-	-	-	7.7	54.1	38.2	-	74.0	26.0
2	-	-	-	12.9	32.7	54.5	7.3	46.7	46.0
3	-	-	-	6.2	32.3	61.5	4.3	38.5	57.1
4+	-	-	-	15.4	59.0	25.6	2.4	15.8	81.8
G. ALLOWED TO VISIT HEALTH CARE FACILITIES									
Allowed to go alone	-	-	-	5.3	56.6	38.1	6.9	54.8	38.4
Not allowed to go alone	-	-	-	9.6	62.4	27.9	-	56.8	43.2

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 5: Use Compliance For Oral Pill, Injectable and Condom by Service Points (National)

Service Points	Percentage of Compliant Users		
	Oral Pill	Injectable	Condom
Clinic	84.1	98.8	73.3
SMC	78.0	100.0	61.6
Field Worker	81.9	100.0	71.0
All	81.3	99.1	66.0
N	1544	392	270

Source: BDHS 1993-94

Table 6: Use Compliance For Oral Pill by Service Points (National and Divisional)

Service Points	Dhaka	Chittagong	Rajshahi	Khulna	Barisal	National
Clinic	76.9	94.8	89.5	84.5	79.2	84.1
SMC	79.3	60.4	83.6	82.8	78.3	78.0
Field Worker	78.4	78.5	87.3	77.5	85.3	81.9
All	78.4	76.5	86.8	79.0	82.9	81.3
N	494	208	513	227	103	1544

Source: BDHS 1993-94

Table 7: Percentage of Clients Discontinuing Use During Most Recent Use Segment of Different Modern Methods by Source of Supply

Method	Source of Supply				
	Clinic	SMC	Fieldworker	Other	All
Oral Pill	21.08	51.87	42.45	30.52	36.28
IUD, Copper T	5.00	2.44	3.65	1.06	3.81
Injections	8.88	3.32	9.92	5.08	8.23
Condom	3.11	19.36	7.26	7.35	7.94
Sterilization	0.07	0.00	0.05	0.00	0.05
All Method	38.14	77.00	63.44	44.01	56.30
N	1440	726	1854	155	4176

Source: BDHS 1993-94

Table 8: Percentage of Clients Mentioned Different Reasons for Discontinuation of Modern Methods by Source of Supply

Reasons For Discontinuation	Source of Supply				
	Clinic	SMC	Fieldworker	Other	All
Method failure	6.54	8.98	5.76	13.83	6.94
Wanted pregnancy	17.06	30.24	24.87	16.08	24.06
Side-effects/Health reasons	48.24	28.61	43.88	40.67	41.20
Other	28.16	32.17	25.48	29.41	27.80
N	606	612	1298	75	2591

Source: BDHS 1993-94

Table 9: Prevalence of Different Contraceptive Methods by Women's Mobility Status

Methods currently using	Physical Mobility to Health Facility	
	Yes , alone or with children	Not allowed to go
Oral Pill, Maya	19.8	17.4
IUD, Copper T	2.8	0.8
Injectable	5.5	2.8
Condom, Raja	3.4	2.4
Sterilization	11.8	4.6
Traditional Methods	9.7	7.3
No Method	47.1	64.7
N	6342	1302

Source: BDHS 1993-94

Table 10: Women's Mobility Status and Choice of Service Points

Service Points	Physical Mobility to Health Facility	
	Yes , alone or with children	Not allowed to go
Clinic	35.6	18.3
SMC	17.2	22.0
Fieldworker	43.7	55.3
Other	3.5	4.4
N	3889	553

Source: BDHS 1993-94

Table 11: Fieldworker Referral Patterns for Clinical Services by Division

FW Referred to Clinic?	Khulna/Barisal	Chittagong	Dhaka	Rajshahi	National
Yes	9.5	6.2	5.0	6.6	6.8
No	90.5	93.8	95.0	93.4	93.2
N	896	783	1083	1044	3805

Source: BDHS 1993-94

Table 12: Types of Services for Which Clients Referred by Fieldworker by Division

Services Referred for	Percentage of clients referred by fieldworker to clinics for different services				National
	Khulna/Barisal	Chittagong	Dhaka	Rajshahi	
Sterilization	14.9	17.6	7.3	18.1	14.7
IUD Insertion	30.7	21.0	25.7	31.7	28.1
Injection	33.9	29.5	26.1	28.5	30.0
Other FP Method	3.9	5.4	0.0	4.2	3.4
Treatment of Side-effects	4.0	5.1	10.1	7.6	6.5
Other Health Problems	5.7	18.6	16.7	6.5	10.7
Other	6.8	2.7	14.1	3.4	6.7
N	85	49	54	68	257

Source: BDHS 1993-94

Table 13: Percentage of Current Users of FP Having Health Problems by Service Points (National)

Methods	Clinic	SMC	Fieldworker
Oral Pill	29.6	26.9	34.6
IUD	34.5	-	45.6
Injectable	50.4	40.4	43.1
Condom	12.5	3.2	5.3
Sterilization	43.5	-	100.0
All	42.0	19.5	33.7
N	1399	451	1357

Source: BDHS 1993-94

Table 14: Percentage of persons advised respondent about FP after pregnancy by Division

Person Advised	Khulna/Barisal	Chittagong	Dhaka	Rajshahi	National
Doctor	1.9	1.2	0.8	0.2	1.0
Nurse/MW/FWV	0.7	0.5	0.5	0.9	0.6
Field Worker	19.9	7.2	10.3	12.8	11.6
Husband	4.0	2.9	1.9	2.4	2.7
Other Relatives	6.6	5.3	3.0	6.5	5.3
All*	33.3	17.1	17.2	23.5	21.3
N	380	661	661	432	2132

Source: BDHS 1993-94
* Includes DK category

Table 15: Mean Number of Satellite Clinics Held per Month and Client Attended per Week by Family Welfare Visitors

	Satellite clinic per month			No. of clients attended last week	
Division	N	Mean	STD	Mean	STD
Chittagong	133	7.62	1.41	38.19	19.86
Dhaka	185	6.99	1.88	45.90	24.95
Khulna/Barisal	125	7.86	.90	39.03	21.15
Rajshahi	141	7.70	1.19	40.66	23.32

Source: BDHS 1993-94

Table 16: Percentage of FWV Mentioned Different Types of Problems in Organizing Satellite Clinic (Divisional and National)

Types of Problems	Chittagong	Dhaka	Khulna/Barisal	Rajshahi	National
a. Non-existence of suitable place	17.3	21.6	24.8	30.5	23.5
b. Environment not suitable to see patient/ method sup. prob.	6.8	7.6	3.2	11.4	7.4
c. Transportation	6.8	6.5	8.8	8.5	7.5
d. Equipment (water/table etc.)	6.0	9.7	10.4	9.2	8.9
e. Inadequate supply of medicine	7.5	10.3	5.6	5.0	7.4
f. Superstition	4.5	1.6	3.2	0.7	2.4
g. Shortage of staff/ayah	2.3	2.2	3.2	0.7	2.1
h. Others	6.0	4.9	5.6	8.5	6.2
N	133	185	125	141	58

Source: BDHS 1993-94

Family Planning Program Performance in Bangladesh: A Method-Specific Overview of the Past Decade and Future Prospects

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Introduction

Despite generally slow socioeconomic change, Bangladesh has achieved considerable success in promoting widespread family planning use. Over the last decade, the level of contraceptive use has risen steadily. The use rate of any method of contraception in 1975 was 8 percent, rising to 25 percent in 1985 and to 45 percent in 1993/94.

The rise in contraceptive prevalence has not been uniform for all methods. Some methods, such as oral pills, enjoyed considerable popularity and made a large contribution to family planning program performance. Other methods did not rise as rapidly. This uneven performance has been due to a variety of factors, but the role of programme interventions has no doubt been crucial.

This analysis attempts to evaluate factors that have been associated with variation in the use of different contraceptive methods over the past decade. The data for this study are drawn from three major surveys conducted between 1983 and 1993/94; namely, the 1983 Contraceptive Prevalence Survey (CPS), the 1989 Bangladesh Fertility Survey (BFS), and the 1993/94 Bangladesh Demographic and Heath Survey (BDHS). Characteristics assessed in relation to levels and trends in contraception include place of residence (by urban/rural status and administrative division), age, parity, education of women, fieldworker visitation, and the mobility of women. Owing to the small number of cases recorded for Barisal Division in these three surveys, these observations have been merged with Khulna Division.

Level and Trends in Contraceptive Method Use

While discussing levels and trends in contraceptive use over the past decade, three broad categories can be identified; namely, (1) modern temporary methods, (2) modern permanent methods, and (3) traditional methods.

Modern Temporary Methods

Modern temporary methods include oral pills, IUD, injectables, and condoms. Table 1 presents the prevalence for these methods by selected characteristics at different points of time between 1983 and

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1993/94. There has been a remarkable increase in the use of modern temporary methods over the past decade. The level of use for modern temporary methods was 6.4 percent in 1983 among currently married women aged 10-49. By 1993/94, prevalence for these methods rose to nearly 27 percent.

This was not a local phenomenon. Both rural and urban areas of the country experienced substantial gains in use, with the greatest increase occurring in rural areas. The rural use rate was 5 percent in 1983 and 26 percent in 1993/94. The corresponding urban rates were 18 and 37 percent. As is evident from these figures, modern temporary method use has always been higher in urban areas. However, during the period from 1989-1993/94, use rates increased more rapidly in rural regions of the country.

In rural Rajshahi and Khulna Divisions, use of modern temporary methods increased more rapidly than in rural Dhaka and Chittagong. The slowest growth in modern temporary methods occurred in rural Chittagong, increasing by only 12 percentage points since 1983. Indeed, use of these methods in rural Chittagong has been persistently low throughout the past decade. By 1993/94, only 17 percent of currently married women were using modern temporary methods in rural Chittagong.

Among urban areas, Dhaka urban has been ahead of all regions in the use of modern temporary methods, reaching a use level of 41 percent in 1993/94. A noteworthy fact is that prevalence rose most rapidly in urban Dhaka between 1983-1989 (18 percentage points). However, after 1989, gains in use have been slowest in urban Dhaka, suggesting that the family planning program has not been performing well in this region during the early 1990s. Also surprising is that urban Chittagong, unlike rural Chittagong, has made substantial progress in increasing prevalence of modern temporary methods. As of 1983, the use level in urban Chittagong was only 14 percent, but by 1993/94 modern temporary method prevalence had risen to 37.5 percent, slightly higher than urban areas of Khulna Division (35.6 percent). Interestingly, urban areas of Chittagong and Rajshahi favored these methods more during the recent five year period (1989-1993/94), while performance was more impressive in urban areas of Dhaka and Khulna during the earlier five year period (1983-1989).

During the past 10 years, use of modern temporary methods increased more rapidly in rural areas of Rajshahi and Khulna in comparison to urban areas. The urban-rural use differential for modern temporary methods narrowed substantially by 1993/94. This has not been the situation in Dhaka and Chittagong Divisions. In fact, in Dhaka the urban-rural gap increased to some extent.

It is revealing to note that older women (aged 25+) have accepted modern temporary methods more rapidly than younger women over the past decade, with use being highest among women aged 25-34. This pattern has occurred in all regions of the country, most prominently in Khulna and Rajshahi.

Zero parity women have not made much use of modern temporary methods. They increased use from only 2.3 percent in 1983 to 2.7 percent in 1993/94. However, zero parity women in Rajshahi have behaved a little differently. They increased their use of modern temporary methods from 2.4 percent in 1983 to 6 percent in 1993/94 (still a very modest use level). However, zero parity women in Chittagong had negligible use of modern temporary methods in 1993/94.

Mothers have substantially increased use over the past decade, with women having 2 or more children reporting the most rapid gains in use. More specifically, the most rapid increases in modern temporary methods have occurred among mothers in Rajshahi with 2 children.

Modern temporary method use is generally higher among women with more education. However, over the past decade, uneducated and less educated (primary incomplete and primary) actually increased their use of modern temporary methods more rapidly than highly educated women with secondary or more levels of schooling. This pattern is most notable in Dhaka, Chittagong, and Khulna Divisions.

Home visits by fieldworkers are associated with substantial gains in the use of modern temporary methods. This pattern is evident in all parts of the country. Fieldworker visits produced rapid gains in use during 1989-1993/94. This result likely reflects the improvement in fieldworker/client ratios that have occurred since 1989.

While fieldworker visits have obviously been useful, more than three visits during a six month period seems to be of little use in promoting use. Women who were visited more than 3 times did not have higher levels of use compared with women visited 2-3 times. However, one should not immediately downplay the need for more visits by fieldworkers. Over the five year period 1989-1993/94, use of modern temporary methods increased substantially for women visited 3 or more times compared to those visited only once or twice. This was observed uniformly in all regions of the country. Thus, more visits may be helpful in convincing less motivated women to use family planning services.

Greater physical mobility of women, as measured by their ability to visit health centers alone, tends to be associated with greater use of modern temporary methods. This finding can be noted in the 1983 CPS, 1989 BFS, and 1993/94 BDHS. It is interesting to observe that the strength of this relationship does not appear to change over time. Since most modern temporary methods are provided by fieldworkers in women's homes rather than by clinic-based providers, women's mobility status may be a more important determinant of clinic rather than home-delivered methods.

Oral Pills

Observations for oral pills are roughly similar to modern temporary methods, since pills dominate this category of use. As can be seen in Table 2, pills are generally used more widely in urban areas, but over the past decade pill use has actually risen more rapidly in rural areas. The greatest gains in use occurred during 1989-1993 in rural areas, while in urban areas the most rapid growth was between 1983-1989.

In rural areas, gains in pill use have been most rapid in Rajshahi. As of 1993/94, the use rate for pills in Rajshahi was 24 percent. Rural Rajshahi's pill use was actually higher than in any urban area of the country. Pill prevalence increased most rapidly in rural Rajshahi, registering a rise of more than 20 percentage points between 1983-1993/94. Gains in pill use were lowest in urban and rural areas of Chittagong and urban areas of Khulna.

Oral pills found more acceptance among women aged 25 and above, although younger women also increased use substantially over the past decade. In Rajshahi, younger women (aged 15-24) actually had similar oral pill prevalence compared to women aged 25 and above.

Zero parity women generally reported some increase in pill use between 1983-1989, but this gain was not sustained between 1989 and 1993/94. However, once again, women in Rajshahi differ somewhat

from national patterns. Zero-parity women in Rajshahi reported some gains in pill use, while women with a first birth had very low use levels in Chittagong and Khulna. Among mothers, pill use experienced a steady increase over the entire decade, with the highest levels of use occurring among women having 2 or more children.

Among uneducated and less educated women (up to primary level) pill use grew steadily over the past decade. However, among more highly educated women (secondary and above) pill use actually fell somewhat after 1989. Declines in pill use prevalence among more educated women were concentrated in Dhaka and Rajshahi Divisions. More educated women in these two regions may have access to a broader array of contraceptive options and make greater use of methods provided through private-sector channels.

As expected, fieldworker visits are associated with greater pill use. These visits appear to have been more effective in promoting use during the 1989-1993/94 period compared to the previous five years. The effect of fieldworker visits on pill use was especially notable in Rajshahi and Dhaka Divisions, while Chittagong lagged behind both in the rate of fieldworker visitation and the use of pills.

As was the case for all modern temporary methods, fieldworker visits produced greater pill prevalence when clients were visited up to three times over a six month period (with three visits producing the best results). No notable increase in pill use can be discerned when clients are visited more than three times over six months.

Women who are less mobile showed a substantial increase in pill use during 1989-1993/94, especially in Dhaka and Khulna Divisions. By 1993/94, pill use among less mobile women was nearly equal to those who could travel freely to clinics. The fact that pill use has risen so rapidly among women with restricted mobility reflects both the high level of demand for family planning in most regions of the country and the importance of fieldworkers in meeting that demand.

IUD

The IUD has not yet become a prominent method in the Bangladesh family planning program. The rural prevalence rate for the method rose from 0.9 in 1983 to 2.0 percent in 1993/94, while urban prevalence grew from 1.8 percent to 3.7 percent over the same period. Since the number of IUD users is still very low, regional patterns of IUD use derived from surveys must be interpreted with caution owing to small sample size. However, findings in Table 3 do suggest that IUD use has improved somewhat in rural areas of Chittagong and Khulna over the past decade.

In 1993/94, IUD use tends to be concentrated among women under the age of 35 with 1-3 children. Older women (35+) and higher parity mothers (4 or more children) are less likely to be using IUDs. Less educated women are also less inclined to use IUDs, especially in Dhaka and Chittagong Divisions.

One interesting feature in Table 3 is that IUD prevalence is significantly higher among women who can travel alone to clinics. Women with restricted mobility are not traveling to clinics and obtaining IUDs, but instead are relying upon fieldworkers to provide modern temporary methods (primarily pills). A major challenge for the family planning program in future years will be the improvement

of referral systems that encourage more potential clients, especially women with restricted mobility, to make greater use of clinical contraceptive methods.

Injectables

Injectables enjoyed a major gain in popularity between 1989-1993/94, both in urban and rural areas. By 1993/94, the prevalence rate for injectables rose from 0.6 to 4.5 percent in rural areas and 1.5 to 4.4 percent in urban areas (see Table 4). By division, the rural use rate ranged between 4.3 percent (Rajshahi) and 5.0 percent (Dhaka) and in urban areas between 2.8 (Rajshahi) and 7.7 percent (Khulna).

Injectable use is currently concentrated among women aged 25-34, especially in Khulna Division. Use among women without any children is negligible, but increases rapidly by parity level. In most divisions, use is highest among mothers with 3 children. However, mothers with four or more children have higher injectable prevalence in Dhaka. In addition, injectables tend to be used more by less educated women. For example, in 1993/94, injectable prevalence among women with no education is 5 percent while among women with secondary or higher levels of educational attainment use is only 0.5 percent.

The rise in injectable use between 1989 and 1993/94 appears to have been partly due to fieldworker activity. As can be seen in Table 4, injectable prevalence in 1993/94 is 7.4 percent if women had been visited at least once over a six month period, while only 2.4 percent if not visited. This pattern is pronounced in all divisions. In 1989, there was not much difference in injectable use by fieldworker visitation status. Women's physical mobility also appears to be associated with greater injectable use. Women who can travel alone or with family members to clinics have an injectable prevalence rate of 5.0 percent, while prevalence is only 2.4 percent among women with restricted mobility. As in the case of IUDs, women with restricted mobility are much less likely to use services that are primarily clinic-based (62.9% of injectable users obtained services from clinics rather than fieldworkers in 1993/94).

Condoms

As in the case of IUDs, condoms have not become a widely used method in Bangladesh. Condoms are used primarily in urban areas. Over the past decade, rural use increased much less rapidly than in urban areas. In 1993/94, the highest rural condom prevalence was in Khulna (3.6 percent) and the greatest urban use was in Rajshahi (11.5 percent).

Condom use is uniformly low across most age and parity groupings (see Table 5). The only notable difference is among women without any children, who generally report negligible use (with Khulna Division being the one exception to this pattern). More educated women tend to use condoms more readily (18.5 % prevalence among women with secondary and higher educational attainment levels). This result is largely a reflection of the higher urban use reported for this method. However, in Rajshahi and Khulna, women with only primary education have also increased their use of condoms in recent years.

While condom use is somewhat higher among women visited by fieldworkers, visitation in the past six months does not seem to be a major factor promoting condom use. Women's mobility status also does not appear to be highly correlated with condom use. In Bangladesh, most couples now acquire condoms through commercial channels (56.2 percent of users) rather than fieldworkers or clinics. Therefore, it is not surprising that fieldworker visitation and mobility status do not make more difference in promoting condom use.

Modern Permanent Methods (Male and Female Sterilization)

Table 6 presents levels and tends in the use of sterilization between 1983 and 1993/94. In general, sterilization performance has not been impressive over the past decade. Prevalence levels have remained largely stagnant in rural areas, while significant reductions have occurred in urban areas. At the national level, sterilization use actually registered a slight gain in rural areas between 1983 and 1993/94 (from 7.1 to 9.4 percent) but fell from 10.0 to 7.2 percent in urban areas. Most of the reduction in urban sterilization prevalence has taken place in Dhaka and Rajshahi, where use levels fell nearly 50% between 1983 and 1993/94). It is somewhat surprising to note that Chittagong, which is the lowest performing Division for modern temporary methods, actually registered a slight increase in sterilization use in both urban and rural areas over the past decade.

Over the past decade, younger women below the age of 25 sharply reduced their use of sterilization. In addition, since 1989, fewer women aged 25-34 have adopted sterilization (prevalence falling from 13.2 to 10.4 percent for these women). By 1993/94, most use was concentrated among women over the age of 35 and mothers having three or more children. The only increase in sterilization between 1989 and 1993/94 occurred among women over the age of 35. This rise was concentrated primarily in Chittagong and Rajshahi Divisions.

Sterilization continues to be a method of choice among less educated women. In 1993/94, sterilization prevalence among women with no education was 11.9 percent compared to 3.5 percent among women with secondary and above. Since 1989, much of the fall in sterilization has been among more highly educated women (primary incomplete through secondary and above). This pattern is especially prominent in Rajshahi and Khulna, where sterilization prevalence among more educated women reached negligible levels.

It is revealing to note that fieldworker visitation was associated with greater sterilization use in 1983, but more recently became unimportant as a factor promoting use. In 1993/94, sterilization prevalence among women not visited by a fieldworker over a six month period was 12.5 percent, compared to only 4.6 percent among women visited by a fieldworker. The removal of sterilization referral fees in 1988 may partially account for this change.

Women with restricted mobility were less likely to use sterilization in 1993/94 than in 1989 (their prevalence falling from 9.8 to 4.0 percent in just 5 years). Since fieldworkers are now less likely to refer clients for sterilization (and accompany clients to clinics), it is not surprising that women less able to travel to clinics would experience the most rapid reductions in sterilization use. Clearly, women with restricted mobility continue to constitute an undeserved group of women that are still reliant upon home-delivered services and who may go largely unserved by a clinic-based delivery

system. Referral systems need to be further strengthened between fieldworkers and clinic providers to ensure that women with less mobility are able to reach clinic sites with as much ease and regularity as their more mobile sisters.

Levels of male sterilization are now very low in Bangladesh. There are not enough cases of vasectomy in the 1993/94 BDHS to identify stable levels and trends by region. Clearly, a major priority for the Bangladesh family planning program will to strengthen vasectomy services (and male methods in general) over the coming years.

Traditional Methods

Traditional methods include abstinence, withdrawal, and other traditional fertility limitation procedures. Since 1989, traditional method use has grown in all divisions, with the exception of Chittagong, which saw traditional methods fall in both urban and rural areas. The continued growth of traditional methods may partly reflect the strong desire for smaller families that now typifies Bangladesh. As is also evident in Table 7, traditional method use is higher in urban than rural areas, especially in Dhaka and Khulna.

Traditional methods are still used predominantly by older high parity women, most notably in Khulna and Rajshahi. Older women may more readily use traditional methods if they think they are more likely to be infecund and not capable of having additional children. More educated women are more likely to use traditional methods, which may reflect a preference for more "natural" methods of birth control. As of 1993/94, 16.1 percent of highly educated women (secondary and above) were using traditional methods compared to only 6.7 percent of women with no education. Even though most women reduced their use of traditional methods in Chittagong between 1989 and 1993/94, more educated women doubled their use of traditional methods (from 10.7 percent to 20.3 percent). Additional research is needed to determine why more educated women appear to have such strong preferences for traditional methods, including what factors influence their choice of method and mode of use.

Intended Future Use

As was noted above, contraceptive use has increased dramatically in Bangladesh since 1983. In addition, among non-users, the intention to use a method sometime in the future has risen substantially. As can be seen in Table 8, in 1983, 36.3 percent of non-users in rural areas and 53.3 percent of non-users in urban areas intended to use in the future. By 1993/94, intention to use had risen to 66.5 percent in rural regions and 71.1 percent in urban settings. The greatest gains in intention to use occurred between 1983-1989 rather than 1989-1993/94, which coincides with the period when family planning program performance accelerated most dramatically.

Intention to use has increased most rapidly among younger women under the age of 25. 85.3 percent of non-users aged less than 25 said they intended to use in the future, a rise from 46.8 percent in 1983. This high level of demand among younger women is encouraging in that it likely signals future gains in prevalence for the family planning program. However, such high demand among younger women also poses a challenge for the program since client loads will rise substantially in future years, and at

a time when the program is also committing more logistical and financial resources to upgrading the quality of services.

Findings presented in Table 8 show that the intention to use among mothers with 4 or more children is still substantially below levels reported by women with fewer children. This suggests that the family planning program still needs to direct motivational and educational communications and service interventions more effectively toward higher parity women. Another important result in Table 8 is the rapid rise in the intention to use among zero-parity women (from 39.2 percent in 1983 to 73.1% in 1993/94). Since women without children currently have very low use levels, this surprisingly high demand among zero-parity women constitutes a significant source of unmet need that requires attention by the family planning program.

Between 1983 and 1993/94, the intention to use among non-users has increased most rapidly among women with no education (from 32.7 percent to 61.0 percent). This indicates that the program has been reasonably successful in motivating uneducated women to use family planning in recent years. However, in 1993/94, uneducated women were still less likely to intend using (61.0 percent) when compared to highly educated women (86.0 percent).

Women who have been visited by fieldworkers in the previous six months are more likely to intend using then women without visits. However, this differential has not changed significantly since 1983, which suggests that fieldworkers have not become notably more effective in promoting demand for contraception. It is also worth noting that women's mobility status does not have any systematic association with intention to use.

Intended Method of Contraception

Intended Method by Selected Characteristics

In 1993/94, oral pills were chosen by most non-users as their preferred future method. In rural areas, 47.0 percent of non-users want to use pills, while in urban areas 47.6 percent prefer pills. Injectable contraception is the next most favored method, followed by traditional methods, sterilization, condoms, and IUDs. Over the past decade, pills have experienced the most rapid rise in intended use and sterilization the most pronounced decline.

Method-specific patterns of intended use by selected background characteristics are shown in Table 9. Younger women (under the age of 25), women with only 1-2 children, and women with more education are more likely to state a preference for pills as a future intended method. Somewhat surprisingly, women visited by a fieldworker in the last six months are no more likely to prefer pills than women not receiving visits, suggesting that fieldworker contact may not be a crucial factor in promoting demand for pills.

The second most preferred method among current non-users is injectable contraception. Women in rural areas are somewhat more likely to chose injectables as their future intended method (21.2 percent in rural areas and 13.1 percent in urban areas). In addition, unlike pills, injectables appear to be preferred by older women with more children (especially parities 3 and 4+) and by less educated

women. It is worth noting that hardly any women with secondary and higher levels of education stated a preference for injectables in 1993/94, a considerable decline from 17.2 percent in 1989. It is not clear what has caused this dramatic fall in injectable preference among more highly educated women.

Sterilization has declined most rapidly over the past decade as the preferred future method among non-users. In 1983, 11.3 percent of non-users in rural areas and 13.1 percent in urban areas stated a desire to use sterilization in the future. By 1993/94, intended use of sterilization had fallen to 4.1 percent (rural) and 3.7 percent (urban). Younger women under the age of 25 and low parity women reported the most rapid declines in sterilization preference. In addition, all education categories reported sharp reductions in sterilization preference over the past decade.

An additional finding of note in Table 9 is that women with restricted mobility in 1993/94 are less likely to prefer sterilization (1.8 percent) than women who can travel easily to a clinic (3.6 percent). In 1989, mobility status and intention to use sterilization were not strongly correlated, suggesting that changes in fieldworker referral mechanisms (especially the practice of accompanying clients to clinics) may have reduced interest in sterilization by less mobile women.

Intended Method by Reproductive Desire

Table 10 presents information on the distribution of women who are not currently using but intend to use in the future by method of choice and reproductive intention. Reproductive intention is defined in two ways; namely, as (1) women who want to have another child but wish to delay giving birth for more than two years (i.e., women who want to space), and (2) women who do not want anymore children (i.e., women who want to limit).

Among women who want to space, oral pills and injectables are the most preferred methods in 1993/94. These are appropriate methods for spacing. However, among women who want to limit, most women are still choosing pills and injectables. Sterilization and IUDs, more appropriate long-term methods for women wanting to limit births, are not seen as desirable by women who do not want another birth. It is discouraging to note that the percentage of women wanting to limit who preferred sterilization as a future method actually fell from 12.6 percent in 1983 to 5.3 percent in 1993/94. As can be seen in Table 11, the strong interest in pills and injectables among both spaces and limiters is fairly uniform throughout the country (although there is evidence that limiters in Chittagong still have somewhat higher preference for sterilization).

A particularly sobering finding is that older women above the age of 35 who don't want anymore children are stating a strong preference for hormonal-based contraceptives that are more appropriate for younger women interested in spacing. In 1983, 29.0 percent of women aged 35+ who did not want anymore children stated a preference for oral pills. By 1993/94, 37.0 percent of older women desiring to limit intended to use pills. During this same period, interest in sterilization among older limiting women fell from 11.1 percent to 5.1 percent. Clearly, the reproductive health needs of older women are not being well served by the Bangladesh family planning program at the present time. Upgrading clinical services that provide high quality permanent methods to older women should be a high priority.

Conclusions

Since 1983, Bangladesh has experienced rapid growth in contraceptive use. Most of this increase has been in modern reversible contraception (primarily oral pills and injectables) rather than permanent and traditional methods. Indeed, permanent method use has registered some decline over the past decade, primarily in urban areas.

Results from this analysis identified the following regional patterns of family planning program performance between 1983-1993/94:

- Since 1983, oral pill use has increased most rapidly in rural areas of Rajshahi and Khulna and most slowly in rural Chittagong Division;

- The most rapid gains in IUD prevalence since 1983 occurred in urban areas of Dhaka while rural Dhaka Division had the slowest gains for the IUD. However, the number of IUD cases by division is quite small, so the regional trends that have been identified may not be very reliable;

- The most rapid increase in injectable prevalence since 1989 has taken place in urban and rural areas of Khulna Division and urban Rajshahi has reported the slowest rise in injectable use;

- Only one area, urban Rajshahi, registered sizeable gains in condom prevalence since 1983, with rural areas in Dhaka having the smallest gains in condom prevalence;

- Much of the decline in sterilization prevalence since 1983 has been in urban regions of Dhaka and Rajshahi. Small gains in sterilization prevalence were noted in rural areas of Chittagong and Rajshahi;

- Traditional method use has risen in Khulna over the past decade. There is not much change to report in other divisions;

These regional performance patterns are important to consider when planning future intervention strategies and resource allocations.

An important finding from this study is that fieldworkers have been instrumental in providing modern temporary methods. Use of pills, injectables, and condoms is considerably higher when women have been visited by fieldworkers within a six month period. As fieldworker/client densities increased between 1983 and 1993/94, women were increasingly likely to report being visited by a fieldworker and to be using a method if visited.

Women who say that they cannot travel alone or with family members to clinics (about 18 percent of the total 1993/94 BDHS sample) appear to be reliant upon "door-step" delivery by fieldworkers for their reproductive health needs. The use of clinic-based methods (e.g., IUDs and sterilization) is very low among women with restricted mobility. A major challenge for the program in future years will

be how to enhance the utilization of clinic services (e.g., through more effective referral systems) among women who are socially constrained in their ability to travel easily to clinics.

This study has also highlighted several other future challenges for the Bangladesh family planning program. For example, findings indicate that there are many women without a first child who are interested in using contraception, but who are currently going unserved by the program. Greater efforts need to be made to reach zero-parity women (e.g., by ensuring that fieldworkers visit all women of reproductive age rather than just mothers) and provide young women with the option of delaying the age at which they begin to have children.

Comparison of intended use patterns for older women (aged 35+) found a strong preference for pills and injectables rather than permanent and longer-term methods such as IUDs and sterilization. This pattern was especially notable among older women who do not want to have anymore children (i.e., women who want to limit rather than space births). Clearly, the reproductive health needs of these women are not being well-provided for. Improving access and quality of clinical services (especially the provision of permanent and semi-permanent contraception) should be a high priority for the program at the present time.

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Table 1: Level and Trends of Use of Modern Temporary Methods According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	169	430	756	88	230	412	134	483	723	78	297	537	469	1440	2428
A. RESIDENCE															
Rural	5.3	10.9	24.4	3.7	7.7	16.6	5.8	16.1	32.8	4.2	13.1	31.0	4.8	11.8	25.7
Urban	19.0	33.6	41.0	14.3	23.9	37.5	16.9	27.3	39.0	17.9	28.8	35.6	18.1	29.2	37.3
B. AGE															
<25	7.2	13.0	21.5	4.1	9.0	15.0	6.1	16.0	33.0	5.9	17.0	32.6	5.9	13.8	25.1
25-34	9.4	14.0	36.7	5.2	12.1	22.6	9.1	22.2	39.5	5.5	16.7	38.1	7.7	16.9	34.2
35+	4.6	7.1	23.3	4.4	4.1	14.1	3.7	11.0	23.7	3.8	7.8	19.8	4.3	7.8	20.1
C. PARITY															
0	3.0	6.3	2.4	0.8	3.4	-	2.4	4.1	5.7	2.1	6.1	4.1	2.3	5.0	2.7
1	7.7	13.1	23.7	2.9	9.0	12.7	6.6	18.2	36.9	7.4	21.6	31.4	6.1	15.1	26.4
2	11.3	17.2	32.0	6.5	13.0	21.0	8.6	21.7	39.8	4.8	21.4	41.4	8.1	18.2	33.4
3	9.3	15.0	35.1	8.8	14.3	21.5	7.6	21.1	37.7	6.8	13.6	42.8	7.8	16.2	33.8
4+	6.5	12.4	31.1	6.1	6.4	20.6	6.8	16.6	34.5	4.8	11.1	25.4	6.0	11.5	27.6
D. EDUCATION															
No education	3.5	8.6	21.7	2.2	4.3	14.3	3.9	11.9	28.1	3.0	10.0	28.9	3.3	8.8	22.4
Primary incomplete	9.2	16.0	30.9	4.9	7.9	16.7	8.2	24.1	37.6	6.6	14.2	29.7	6.8	15.8	29.2
Primary complete	14.4	21.2	41.3	11.1	14.0	30.1	15.9	28.4	48.9	5.8	17.1	40.3	12.0	19.9	39.5
Secondary/higher	32.0	33.0	45.7	23.5	29.8	33.6	24.1	44.3	50.2	20.5	35.3	42.4	25.7	34.7	43.4
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	11.6	17.8	46.8	9.0	13.4	34.4	11.8	23.1	54.0	7.7	19.5	46.7	10.6	18.7	46.2
No	5.6	9.1	14.9	3.2	5.5	9.3	3.6	11.0	14.2	4.2	9.3	15.1	4.2	8.6	13.1
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	9.1	14.9	-	5.5	9.3	-	11.0	14.2	-	9.3	15.1	-	8.6	13.1
1	-	18.4	29.2	-	14.6	25.0	-	23.2	29.6	-	18.6	36.1	-	19.0	29.6
2	-	15.1	49.6	-	12.4	31.8	-	26.4	55.4	-	23.4	50.6	-	19.4	28.5
3	-	22.1	58.7	-	17.4	40.0	-	22.5	61.5	-	21.2	51.6	-	21.3	55.1
4+	-	13.1	45.4	-	5.4	38.4	-	10.1	54.3	-	10.0	44.6	-	10.0	45.6
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	29.3	29.4	-	28.2	19.2	-	30.3	34.8	-	34.0	33.7	-	30.2	28.8
Not allowed to go alone	-	10.7	20.5	-	6.8	12.6	-	15.5	26.7	-	12.2	22.3	-	11.3	20.2

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 2: Level and Trends of Use of Oral Pills According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	98	310	501	52	148	213	71	373	513	34	194	333	255	1025	1560
A. RESIDENCE															
Rural	3.0	8.1	17.1	2.3	5.1	8.4	3.1	12.8	23.7	1.6	8.5	19.5	2.6	8.6	16.9
Urban	11.2	22.1	23.0	8.1	13.6	16.5	10.0	17.0	21.8	11.3	19.1	19.1	10.4	18.7	20.9
B. AGE															
<25	4.0	10.2	15.0	2.8	6.4	8.6	3.4	11.9	23.2	2.4	11.5	19.7	3.2	10.0	16.5
25-34	5.6	11.6	24.6	3.0	7.2	12.0	4.9	17.4	28.6	2.9	10.8	24.7	4.3	12.0	22.2
35+	2.7	5.3	13.8	2.4	2.6	6.0	1.9	8.9	16.5	1.6	4.7	12.6	2.2	5.4	12.0
C. PARITY															
0	0.6	3.5	2.4	-	1.7	-	1.0	2.7	5.7	0.5	2.7	-	0.6	2.7	2.2
1	4.5	10.7	15.3	2.6	7.0	7.4	4.2	12.9	26.4	2.9	16.2	19.4	3.7	11.4	17.4
2	7.4	11.9	22.3	2.6	9.2	12.0	3.8	16.5	30.5	2.8	13.7	25.4	4.4	12.9	22.7
3	5.4	10.6	22.5	3.0	8.1	11.2	3.7	15.7	23.2	2.9	8.0	26.8	3.8	10.9	20.6
4+	3.8	9.0	20.7	3.8	3.9	10.0	3.8	14.0	24.6	2.3	7.3	16.1	3.5	8.5	17.4
D. EDUCATION															
No education	2.0	6.4	15.0	1.5	2.6	6.5	2.2	9.8	20.5	1.2	6.9	18.8	1.8	6.6	14.7
Primary incomplete	6.5	11.0	21.1	2.9	5.3	9.3	3.5	16.4	27.9	2.5	8.8	18.2	3.8	10.4	19.2
Primary complete	7.2	15.5	25.6	7.2	10.7	19.3	8.4	21.7	29.8	3.8	10.5	23.7	6.8	14.4	24.3
Secondary/higher	16.8	22.9	19.6	11.3	18.7	19.0	13.7	32.3	24.1	8.3	22.4	23.0	13.0	23.4	20.9
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	6.9	12.7	33.9	5.6	9.0	19.4	6.2	18.1	40.1	2.8	12.1	31.3	5.7	13.3	32.0
No	3.2	6.7	8.0	1.9	3.4	4.0	1.9	8.2	8.4	2.1	6.7	6.8	2.3	6.1	6.7
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	6.7	8.0	-	3.4	4.0	-	8.2	8.4	-	6.7	6.8	-	6.1	6.7
1	-	12.8	17.7	-	9.7	14.2	-	18.7	25.1	-	11.9	25.1	-	13.7	19.8
2	-	9.8	36.1	-	8.5	15.7	-	20.7	40.1	-	13.9	35.1	-	13.4	33.6
3	-	17.5	47.2	-	11.3	29.4	-	17.6	48.6	-	13.0	37.0	-	15.7	42.7
4+	-	9.1	31.0	-	3.3	19.5	-	3.6	37.2	-	5.9	27.2	-	6.0	28.7
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	17.8	18.6	-	15.9	10.0	-	20.1	24.6	-	22.3	20.2	-	18.8	18.1
Not allowed to go alone	-	8.2	16.9	-	4.6	7.1	-	12.3	20.5	-	8.0	16.8	-	8.4	15.0

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 3: Level and Trends of Use of IUD According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	17	44	53	15	37	48	32	38	45	14	35	49	78	153	196
A. RESIDENCE															
Rural	0.6	1.2	1.3	0.8	1.3	2.0	1.5	1.2	2.0	0.9	1.7	2.9	0.9	1.3	2.0
Urban	1.7	2.6	4.8	1.2	2.9	2.6	2.3	2.7	2.9	0.9	2.1	2.2	1.8	2.5	3.7
B. AGE															
<25	0.8	1.4	1.6	0.8	0.9	1.2	1.4	1.2	2.2	1.6	1.6	3.3	1.1	1.2	2.0
25-34	1.0	1.2	2.4	0.6	2.6	3.0	2.0	2.1	2.7	0.7	2.6	3.8	1.2	2.1	2.9
35+	0.2	1.4	1.9	1.0	0.6	1.7	1.0	0.5	1.0	-	0.7	1.3	0.6	0.8	1.5
C. PARITY															
0	0.3	-	-	-	0.4	-	-	-	-	-	0.5	-	0.1	0.2	-
1	0.8	0.7	2.2	-	1.0	1.5	1.1	1.7	2.2	1.6	2.0	3.9	0.8	1.3	2.4
2	1.3	2.3	1.9	1.3	1.0	2.8	3.5	2.2	2.1	1.2	2.1	5.1	1.9	1.9	2.8
3	0.9	1.6	3.5	2.2	3.6	2.7	2.3	2.0	4.0	2.9	2.3	4.2	2.0	2.3	3.6
4+	0.7	1.5	1.6	0.7	1.2	2.3	1.4	0.9	1.8	-	1.5	1.1	0.7	1.3	1.8
D. EDUCATION															
No education	0.4	1.1	0.8	0.3	0.8	1.6	1.0	0.9	1.8	0.7	1.4	2.7	0.6	1.0	1.5
Primary incomplete	0.3	1.6	2.7	1.0	1.8	2.2	1.9	2.6	2.0	0.8	2.3	3.2	1.0	2.1	2.5
Primary complete	1.2	2.6	4.5	3.3	0.6	4.1	4.7	2.4	4.0	2.0	2.4	2.9	2.5	2.0	3.9
Secondary/higher	4.7	1.6	6.7	2.6	4.9	-	4.0	2.4	1.4	2.3	1.7	1.6	3.5	2.7	3.5
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	1.2	2.1	2.0	1.8	2.2	2.7	2.4	1.8	2.8	1.6	2.7	3.2	1.8	2.1	2.6
No	0.6	0.7	1.9	0.4	0.8	1.7	1.1	0.9	1.5	0.6	0.7	2.6	0.7	0.8	1.8
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	0.7	1.9	-	0.8	1.7	-	0.9	1.5	-	0.7	2.6	-	0.8	1.8
1	-	2.4	2.8	-	2.1	1.7	-	1.7	2.5	-	2.4	0.8	-	2.1	2.0
2	-	2.4	1.5	-	2.9	2.9	-	1.7	2.5	-	3.3	3.0	-	2.5	2.4
3	-	1.6	2.1	-	3.4	0.9	-	2.4	2.2	-	3.2	2.1	-	2.4	1.9
4+	-	1.0	2.0	-	-	4.1	-	-	3.8	-	1.9	4.9	-	0.7	3.7
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	3.6	2.4	-	4.6	2.4	-	2.1	2.4	-	4.2	3.5	-	3.5	2.6
Not allowed to go alone	-	1.0	0.5	-	1.1	0.9	-	1.2	0.6	-	1.4	0.4	-	1.2	0.7

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 4: Level and Trends of Use of Injectables According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	10	17	120	2	8	103	4	27	92	3	23	89	19	75	404
A. RESIDENCE															
Rural	0.4	0.4	4.4	0.1	0.2	4.5	0.1	0.9	4.3	0.1	1.0	5.0	0.2	0.6	4.5
Urban	0.9	1.5	4.3	-	1.8	3.7	-	1.1	2.8	-	1.8	7.7	0.7	1.5	4.4
B. AGE															
<25	0.1	0.7	2.3	-	0.2	2.8	0.1	0.9	3.6	-	1.0	5.4	0.1	0.7	3.4
25-34	0.8	0.6	5.9	0.2	0.5	5.8	0.3	1.3	5.5	0.2	1.2	7.0	0.4	0.9	6.0
35+	0.6	0.2	5.0	-	0.2	4.5	-	0.4	3.5	0.3	1.1	2.7	0.3	0.4	4.1
C. PARITY															
0	-	0.1	-	-	-	-	-	-	-	-	0.5	-	-	0.1	-
1	-	0.7	2.8	-	-	2.5	-	1.5	3.8	-	0.5	4.1	-	0.7	3.3
2	-	1.1	3.8	1.3	0.4	3.6	-	1.2	3.9	-	1.8	7.0	0.1	1.1	4.4
3	0.6	0.4	4.5	2.2	0.8	6.3	0.3	1.2	7.7	-	0.8	7.7	0.3	0.8	6.4
4+	1.0	0.4	7.2	0.7	0.3	6.2	0.3	0.7	4.8	0.4	1.4	4.9	0.5	0.6	6.0
D. EDUCATION															
No education	0.3	0.5	4.6	0.1	0.3	5.2	0.1	0.6	4.6	0.1	0.7	6.3	0.2	0.5	5.0
Primary incomplete	1.2	0.5	4.8	-	-	4.4	0.3	2.2	3.8	-	1.2	4.7	0.4	1.0	4.5
Primary complete	1.2	0.6	3.6	-	0.3	1.4	-	1.8	3.4	-	1.9	3.7	0.5	1.1	3.0
Secondary/higher	-	0.5	-	-	0.8	-	0.8	1.6	1.4	0.8	2.4	1.2	0.4	1.2	0.5
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	0.4	0.6	6.9	-	0.3	8.9	0.1	1.3	6.8	0.5	1.8	7.4	0.3	1.0	7.4
No	0.4	0.4	2.7	0.1	0.3	2.2	0.2	0.6	1.9	0.1	0.4	2.8	0.2	0.4	2.4
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	0.4	2.7	-	0.3	2.2	-	0.6	1.9	-	0.4	2.8	-	0.4	2.4
1	-	0.6	3.7	-	0.6	7.4	-	1.3	1.2	-	1.7	7.5	-	1.0	5.0
2	-	1.1	7.4	-	0.1	11.4	-	0.9	8.1	-	2.2	8.0	-	1.1	8.4
3	-	0.4	6.3	-	-	6.3	-	1.8	5.6	-	2.4	7.1	-	1.2	6.2
4+	-	0.3	9.0	-	-	9.4	-	1.6	8.7	-	0.3	7.0	-	0.5	8.5
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	1.1	4.9	-	0.9	4.8	-	3.4	4.6	-	2.5	6.1	-	1.9	5.0
Not allowed to go alone	-	0.4	1.9	-	0.2	2.9	-	0.7	2.9	-	0.9	1.8	-	0.5	2.4

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 5: Level and Trends of Use of Condoms According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	44	59	82	18	37	48	27	45	73	27	45	66	117	187	269
A. RESIDENCE															
Rural	1.3	1.2	1.6	0.5	1.1	1.7	1.1	1.2	2.8	1.6	1.9	3.6	1.1	1.3	2.3
Urban	5.2	7.4	8.9	5.0	5.6	5.8	4.6	6.5	11.5	5.7	5.8	6.6	5.2	6.5	8.3
B. AGE															
<25	2.3	0.7	2.6	0.5	1.5	2.4	1.2	2.0	4.0	1.9	2.9	4.2	1.5	1.9	3.2
25-34	2.0	0.6	3.8	1.4	1.8	1.8	1.9	1.4	3.1	1.7	2.1	4.0	1.8	1.9	3.1
35+	1.1	0.2	2.3	1.0	0.7	1.9	0.8	1.2	2.7	1.9	1.3	3.2	1.2	1.2	2.5
C. PARITY															
0	2.1	2.7	-	0.8	1.3	-	1.4	1.4	-	1.6	2.4	4.1	1.6	2.0	0.5
1	2.4	1.0	3.4	0.3	1.0	1.3	1.3	2.1	4.5	2.9	2.9	4.0	1.6	1.7	3.3
2	2.6	1.9	4.0	1.3	2.4	2.6	1.3	1.8	3.3	0.8	3.8	3.9	1.7	2.3	3.5
3	2.4	2.4	4.6	1.4	1.8	1.3	1.3	2.2	2.8	1.0	2.5	4.1	1.7	2.2	3.2
4+	1.0	1.5	1.6	0.9	1.0	2.1	1.3	1.0	3.3	2.1	0.9	3.3	1.3	1.1	2.4
D. EDUCATION															
No education	0.8	0.6	1.3	0.3	0.6	1.0	0.6	0.6	1.2	1.0	1.0	1.1	0.7	0.7	1.2
Primary incomplete	1.2	2.9	2.3	1.0	0.8	2.0	2.5	2.9	3.9	1.6	1.9	3.6	1.6	2.3	3.0
Primary complete	4.8	2.5	7.6	0.6	2.4	5.3	2.8	2.5	11.7	-	2.3	10.0	2.2	2.4	8.3
Secondary/higher	10.5	8.0	19.4	9.6	5.4	14.6	5.6	8.0	23.3	9.1	8.8	16.6	8.8	7.4	18.5
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	3.1	2.4	4.0	1.6	1.9	3.4	3.1	1.9	4.3	2.8	2.9	4.8	2.8	2.3	4.2
No	1.4	1.3	2.3	0.8	1.0	1.4	0.4	1.3	2.4	1.4	1.5	2.9	1.0	1.3	2.2
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	1.3	2.3	-	1.0	1.4	-	1.3	2.4	-	1.5	2.9	-	1.3	2.2
1	-	2.6	5.0	-	2.2	1.7	-	1.5	0.8	-	2.6	2.7	-	2.2	2.8
2	-	1.8	4.6	-	0.9	1.8	-	3.1	4.7	-	4.0	4.5	-	2.4	4.1
3	-	2.6	3.1	-	2.7	3.4	-	0.7	5.1	-	2.6	5.4	-	2.0	4.3
4+	-	2.7	3.4	-	2.1	5.4	-	4.9	4.6	-	1.9	5.5	-	2.8	4.7
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	6.8	3.5	-	6.8	2.0	-	4.7	3.2	-	5.0	3.9	-	6.0	3.1
Not allowed to go alone	-	1.1	1.2	-	0.9	1.7	-	1.3	2.7	-	1.9	3.3	-	1.2	2.1

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 6: Level and Trends of Use of Modern Permanent Methods According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	182	369	244	73	133	135	188	364	276	124	229	167	567	1094	822
A. RESIDENCE															
Rural	7.1	11.2	9.3	3.8	5.0	5.5	9.2	13.0	13.2	8.5	11.3	10.0	7.1	10.1	9.4
Urban	12.4	9.9	7.0	5.0	5.8	8.8	10.0	9.7	5.5	8.5	8.9	7.0	10.0	8.9	7.2
B. AGE															
<25	3.0	1.8	2.0	0.7	0.4	0.4	4.5	3.9	2.5	4.1	1.7	0.6	3.1	2.0	1.5
25-34	12.2	14.7	10.2	5.1	5.5	5.0	14.3	17.3	16.7	13.5	14.5	10.4	11.2	13.2	10.4
35+	11.1	19.8	16.6	7.1	10.5	13.3	11.5	19.5	23.9	9.8	20.0	20.8	9.9	17.4	18.1
C. PARITY															
0	1.2	1.4	7.3	-	0.8	-	0.7	1.5	5.7	-	0.9	4.1	0.6	1.2	4.2
1	1.1	3.5	2.0	0.3	0.6	0.4	2.9	4.9	5.4	2.9	1.4	3.1	1.8	2.9	2.8
2	7.9	9.5	8.2	1.3	2.2	4.0	12.3	16.2	14.0	8.1	9.8	9.0	7.4	9.8	8.9
3	11.1	13.4	16.1	4.3	4.3	6.7	14.8	19.0	21.0	12.9	18.5	13.8	10.8	13.9	14.4
4+	12.3	18.4	12.5	7.7	9.5	9.8	12.4	16.6	17.4	12.3	16.5	15.3	11.1	15.2	13.3
D. EDUCATION															
No education	9.0	12.8	11.7	3.9	5.7	6.2	11.1	14.9	16.9	10.5	12.7	13.8	8.5	11.7	11.9
Primary incomplete	5.0	8.2	5.1	4.5	3.5	5.9	5.2	9.1	7.8	7.1	12.7	7.7	5.5	8.3	6.6
Primary complete	6.0	7.8	4.6	3.9	5.0	3.9	5.6	6.0	2.3	6.7	5.8	4.7	5.5	6.1	4.0
Secondary/higher	6.3	5.0	6.1	2.6	3.0	3.5	2.4	4.0	-	1.5	4.7	-	3.4	4.2	3.5
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	8.1	10.4	4.4	7.2	4.1	3.7	8.7	11.8	5.7	9.5	11.7	4.3	8.4	9.7	4.6
No	7.8	11.6	11.7	2.9	5.6	6.8	9.6	13.7	19.1	8.1	10.5	15.6	7.0	10.3	12.5
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	11.6	11.7	-	5.6	6.8	-	13.7	19.1	-	10.5	15.6	-	10.3	12.5
1	-	10.5	7.0	-	3.2	5.2	-	11.4	10.6	-	11.2	1.9	-	9.2	6.2
2	-	8.7	3.3	-	6.0	1.8	-	14.4	4.6	-	16.1	4.0	-	11.3	3.6
3	-	13.4	4.6	-	6.1	3.4	-	9.3	3.3	-	10.3	2.8	-	10.5	3.6
4+	-	8.0	3.9	-	2.8	4.4	-	12.5	7.4	-	4.6	6.3	-	6.9	5.5
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	11.8	10.4	-	5.5	6.8	-	14.2	14.7	-	15.9	11.7	-	11.9	10.8
Not allowed to go alone	-	11.0	3.6	-	5.0	2.8	-	12.6	6.0	-	10.6	3.6	-	9.8	4.0

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 7: Level and Trends of Use of Traditional Methods According to Background Characteristics (National and Divisional)

CHARACTERISTICS	DHAKA			CHITTAGONG			RAJSHAHI			KHULNA			NATIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
N	119	248	220	75	194	137	137	242	195	100	205	199	431	889	751
A. RESIDENCE															
Rural	4.8	7.4	7.3	3.9	7.1	5.8	6.5	8.5	9.0	6.7	9.7	11.4	5.4	8.1	8.2
Urban	8.0	7.9	10.8	4.4	10.0	6.1	9.2	8.1	7.7	9.4	12.3	14.0	7.6	9.3	9.8
B. AGE															
<25	2.9	•5.4	5.2	3.0	4.3	4.4	5.4	5.3	6.2	6.0	7.0	7.3	4.2	5.4	5.7
25-34	6.9	7.9	8.3	4.3	9.4	6.0	6.0	8.4	9.9	8.4	10.6	12.1	6.3	8.9	8.8
35+	7.3	9.8	11.5	5.1	8.7	7.4	10.3	13.4	12.1	6.4	13.1	16.8	7.3	11.1	11.6
C. PARITY															
0	1.8	5.0	2.4	1.6	0.8	-	2.7	5.3	6.2	4.8	2.5	4.1	2.5	3.6	2.7
1	2.8	5.5	3.9	2.2	4.8	3.8	4.0	4.4	7.1	4.1	10.0	7.1	3.3	5.8	5.4
2	5.3	7.0	8.3	4.5	7.3	6.7	5.6	8.9	7.0	7.3	8.8	9.5	5.6	7.9	7.8
3	4.8	9.3	8.3	3.6	10.1	6.1	8.4	6.3	10.6	7.6	10.6	13.5	5.9	9.0	9.3
4+	7.7	8.8	10.7	5.5	9.4	7.5	9.6	12.8	12.5	8.1	12.9	15.9	7.7	10.7	11.1
D. EDUCATION															
No education	4.2	6.9	6.0	3.0	6.3	5.6	5.2	7.3	7.9	4.8	7.6	8.3	4.3	7.0	6.7
Primary incomplete	6.5	6.2	9.4	3.9	6.9	5.5	9.2	11.1	10.0	7.0	11.3	13.1	6.8	8.7	9.6
Primary complete	6.6	10.0	11.8	5.9	10.4	5.9	13.1	13.5	12.4	9.6	16.1	17.0	8.2	12.3	11.5
Secondary/higher	9.4	11.3	16.7	13.0	10.7	20.3	13.0	10.6	10.1	18.2	14.8	15.4	12.9	11.8	16.1
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS															
Yes	5.2	7.9	6.9	5.6	6.9	6.1	6.8	8.5	7.7	8.3	8.6	12.8	6.4	8.0	8.3
No	5.2	7.1	8.7	3.5	7.5	5.8	6.7	8.5	10.1	6.3	11.3	10.4	5.3	8.3	8.4
F. NUMBER OF VISITS BY A FIELD WORKER IN LAST 6 MONTHS															
0	-	7.1	8.7	-	7.5	5.8	-	8.5	10.1	-	11.3	10.4	-	3.6	8.4
1	-	8.0	10.1	-	7.2	7.6	-	9.6	7.3	-	8.9	16.2	-	5.8	10.2
2	-	10.2	5.3	-	6.0	6.3	-	4.8	7.1	-	7.0	11.5	-	7.9	7.5
3	-	5.7	5.4	-	9.5	4.0	-	10.3	8.2	-	7.8	13.2	-	9.0	7.7
4+	-	6.9	7.9	-	4.9	6.2	-	6.9	8.0	-	12.7	12.3	-	10.7	8.7
G. ALLOWED TO VISIT HEALTH CARE FACILITIES															
Allowed to go alone	-	9.1	8.6	-	11.5	6.5	-	10.6	9.1	-	9.7	12.2	-	10.1	8.8
Not allowed to go alone	-	7.2	4.3	-	6.9	3.1	-	8.3	8.6	-	9.9	10.9	-	7.9	6.3

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 8: Intention to Future Use of FP Methods According to Background Characteristics (National)

CHARACTERISTICS	1983	1989	1993-94
A. RESIDENCE			
Rural	36.3	62.3	66.5
Urban	53.3	68.8	71.1
B. AGE			
<25	46.8	81.4	85.9
25-34	42.9	68.9	75.7
35+	13.0	24.8	20.1
C. PARITY			
0	39.2	70.0	73.1
1	43.6	74.2	80.7
2	46.0	72.2	75.4
3	41.7	64.0	67.2
4+	28.4	47.4	42.3
D. EDUCATION			
No education	32.7	58.8	61.0
Primary incomplete	41.6	65.9	72.9
Primary complete	53.7	73.9	81.9
Secondary/higher	70.5	83.7	86.0
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS			
Yes	47.7	66.0	79.8
No	33.8	60.2	61.1
F. NUMBER OF VISITS BY FIELD WORKER IN LAST 6 MONTHS			
0	-	60.2	61.1
1	-	66.6	82.1
2	-	64.8	80.4
3	-	71.5	81.6
4+	-	56.3	76.5
G. ALLOWED TO VISIT HEALTH CARE FACILITIES			
Allowed to go alone	-	71.0	67.5
Not allowed to go alone	-	62.0	62.2

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 9: Intention of Contraceptive Use According to Background Characteristics (National)

CHARACTERISTICS	ORAL PILL			IUD			INJECTABLE		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
A. RESIDENCE									
Rural	28.3	44.0	47.0	1.9	3.0	2.0	16.5	23.6	21.2
Urban	30.1	45.5	47.6	3.5	4.7	2.8	14.6	17.1	13.1
B. AGE									
<25	28.6	47.3	50.6	2.5	2.7	1.7	15.2	21.8	18.9
25-34	28.4	38.6	43.1	1.7	4.3	2.7	17.1	25.8	21.4
35+	27.3	44.3	36.8	0.7	1.4	2.0	21.5	23.0	28.0
C. PARITY									
0	30.9	47.2	48.6	1.5	2.4	1.7	12.8	16.0	11.5
1	30.3	49.1	51.4	2.3	3.1	2.2	14.0	20.7	17.4
2	27.2	42.8	50.5	2.4	3.9	2.3	16.9	27.1	21.8
3	25.7	41.3	40.9	3.5	3.4	2.2	16.0	23.2	25.3
4+	28.5	39.7	38.1	1.2	3.0	2.4	20.3	27.7	27.8
D. EDUCATION									
No education	29.9	44.9	44.4	1.3	3.3	1.9	15.3	24.2	23.2
Primary incomplete	25.9	43.1	50.2	2.6	2.7	2.3	21.0	24.9	19.5
Primary complete	25.0	42.4	50.2	3.0	2.6	2.0	19.1	20.1	13.9
Secondary/higher	28.0	41.2	51.9	5.5	3.4	1.9	10.9	17.2	-
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS									
Yes	27.9	45.4	47.0	3.0	3.9	2.7	17.1	21.8	21.6
No	28.8	43.0	47.1	1.6	2.6	1.6	15.9	24.4	19.7
F. NUMBER OF VISITS BY FIELD WORKER IN LAST 6 MONTHS									
0	-	43.0	47.1	-	2.6	1.6	-	24.4	19.7
1	-	48.2	46.5	-	3.7	2.3	-	21.4	20.2
2	-	44.3	49.9	-	4.3	2.9	-	19.7	19.7
3	-	41.6	48.9	-	3.4	1.9	-	25.6	21.0
4+	-	38.7	43.1	-	4.5	3.4	-	21.9	25.0
G. ALLOWED TO VISIT HEALTH CARE FACILITIES									
Allowed to go alone	-	44.6	46.3	-	4.0	2.5	-	19.1	21.4
Not allowed to go alone	-	44.0	49.0	-	3.1	0.8	-	23.6	18.0

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 9: (Continued)

CHARACTERISTICS	CONDOM			STERILIZATION			TRADITIONAL		
	1983	1989	1993-94	1983	1989	1993-94	1983	1989	1993-94
A. RESIDENCE									
Rural	2.1	1.2	2.3	11.3	6.0	3.0	5.9	6.9	4.1
Urban	2.6	2.3	4.5	13.1	6.2	3.9	4.4	5.4	3.7
B. AGE									
<25	2.4	1.7	2.3	11.8	4.0	1.6	4.0	4.8	3.4
25-34	2.0	0.8	2.9	11.2	8.8	5.2	7.9	8.0	4.7
35+	1.2	0.6	1.9	10.7	7.8	5.6	9.5	13.7	7.0
C. PARITY									
0	2.3	2.2	1.6	9.5	2.1	1.4	3.9	4.3	5.2
1	2.0	1.3	2.7	12.0	3.5	2.2	3.2	5.3	3.5
2	2.3	1.0	2.4	11.9	7.7	3.9	6.0	5.7	3.6
3	3.1	0.8	2.1	13.7	9.7	4.9	7.1	9.5	4.1
4+	1.6	1.1	2.2	11.0	7.6	5.3	8.1	9.2	6.5
D. EDUCATION									
No education	1.4	0.9	1.7	11.7	6.4	3.2	5.2	6.6	4.1
Primary incomplete	3.2	0.9	2.6	10.2	5.3	3.1	7.1	8.1	4.7
Primary complete	2.5	1.9	4.8	11.0	4.5	2.5	5.6	7.6	2.6
Secondary/higher	4.5	4.2	8.3	13.4	6.0	4.3	6.9	5.7	6.0
E. STATUS OF FIELD WORKER VISITATION IN LAST 6 MONTHS									
Yes	2.4	1.3	3.1	13.6	6.7	4.4	5.6	5.6	3.7
No	2.1	1.3	2.1	10.4	5.5	2.3	5.9	7.8	4.3
F. NUMBER OF VISITS BY FIELDWORKER IN LAST 6 MONTHS									
0	-	1.3	2.1	-	5.5	2.3	-	7.8	4.3
1	-	1.2	2.7	-	6.3	4.5	-	5.0	4.9
2	-	1.5	2.8	-	6.9	4.4	-	6.5	4.4
3	-	1.7	3.8	-	7.9	5.1	-	6.0	2.3
4+	-	0.2	3.3	-	5.9	3.7	-	6.7	3.0
G. ALLOWED TO VISIT HEALTH CARE FACILITIES									
Allowed to go alone	-	2.2	2.6	-	6.2	3.6	-	7.2	3.9
Not allowed to go alone	-	1.2	2.3	-	6.0	1.8	-	6.8	4.3

SOURCE: CPS 1983, BFS 1989, and BDHS 1993-94.

Table 10: Desire Future Child According to Intended Methods (National)

INTENDED METHODS	1983		1989		1993-94	
	SPACER	LIMITER	SPACER	LIMITER	SPACER	LIMITER
N	1011	285	2335	1932	1877	1339
ORAL PILL	30.0	27.4	47.2	40.3	50.3	42.9
IUD	2.3	1.7	3.1	3.2	1.6	2.6
INJECTABLE	13.2	20.4	20.0	27.3	17.2	24.9
CONDOM	2.1	2.2	1.5	0.9	2.6	2.4
STERILIZATION	10.9	12.6	3.7	8.5	1.7	5.3
TRADITIONAL	4.1	8.0	5.3	8.7	3.2	5.4
UNDECIDED	37.5	27.7	19.1	10.9	23.3	16.6

SOURCE: CPS 1983, BFS 1989, AND BDHS 1993-94.

Table 11: Desire Future Child According to Intended Methods by Division

INTENDED METHODS	1983		1989		1993-94	
	SPACER	LIMITER	SPACER	LIMITER	SPACER	LIMITER
DHAKA:						
ORAL PILL	31.1	33.6	48.7	40.5	50.7	41.6
IUD	1.6	1.7	2.5	3.9	1.3	2.7
INJECTABLE	14.9	22.0	19.2	27.4	17.7	25.7
CONDOM	2.4	2.7	1.5	1.1	3.3	2.5
STERILIZATION	13.1	10.8	4.7	7.8	1.1	3.4
TRADITIONAL	4.8	6.8	5.8	10.6	3.0	6.0
CHITTAGONG:						
ORAL PILL	30.4	21.3	43.6	39.6	45.7	41.9
IUD	2.6	1.0	5.5	3.3	2.2	1.9
INJECTABLE	8.4	16.8	18.0	23.3	18.4	24.9
CONDOM	1.1	2.0	0.8	1.0	1.9	1.3
STERILIZATION	13.6	16.3	3.2	11.3	2.4	7.4
TRADITIONAL	2.9	7.4	4.6	8.8	2.6	3.5
RAJSHAHI:						
ORAL PILL	30.8	31.4	52.3	44.2	54.6	48.6
IUD	2.4	1.7	1.8	2.7	1.1	2.9
INJECTABLE	11.9	19.5	20.9	26.3	15.5	22.2
CONDOM	2.1	1.7	1.3	0.6	2.6	2.7
STERILIZATION	7.0	10.5	3.7	6.7	1.5	5.3
TRADITIONAL	4.0	7.7	4.6	6.0	4.0	5.3
KHULNA:						
ORAL PILL	26.6	17.7	41.3	35.9	50.7	39.4
IUD	2.4	2.1	3.0	2.9	2.3	3.3
INJECTABLE	17.3	21.8	23.0	32.8	16.7	27.2
CONDOM	2.0	2.1	2.7	1.0	2.6	3.6
STERILIZATION	9.7	14.6	2.8	9.3	1.8	4.7
TRADITIONAL	4.4	11.0	6.8	9.1	3.8	7.7

SOURCE: CPS 1983, BFS 1989, AND BDHS 1993-94.

Table 12: Desire Future Child According to Intended Methods by Age

INTENDED METHODS	1983		1989		1993-94	
	SPACER	LIMITER	SPACER	LIMITER	SPACER	LIMITER
<25 YEARS:						
ORAL PILL	30.2	25.1	49.3	39.1	52.2	46.7
IUD	2.5	2.0	2.7	3.0	1.5	1.9
INJECTABLE	13.6	21.2	19.6	30.0	16.7	26.0
CONDOM	2.2	2.3	1.6	1.6	2.5	1.8
STERILIZATION	10.8	15.8	2.9	8.3	0.9	3.8
TRADITIONAL	3.8	4.0	4.6	6.1	3.2	4.0
25-34 YEARS:						
ORAL PILL	30.1	28.2	37.8	39.1	44.5	42.2
IUD	1.6	1.7	5.1	4.1	1.8	3.3
INJECTABLE	12.3	19.3	22.1	27.7	18.9	23.0
CONDOM	1.5	2.3	0.9	0.7	3.3	2.8
STERILIZATION	11.5	11.3	7.0	9.4	3.7	6.2
TRADITIONAL	4.6	9.7	8.8	7.7	3.4	5.5
35+ YEARS:						
ORAL PILL	18.8	29.0	40.0	44.9	33.4	37.0
IUD	-	0.8	2.0	1.4	4.3	1.7
INJECTABLE	4.6	22.5	20.0	23.3	19.5	29.2
CONDOM	-	1.4	-	0.7	-	2.2
STERILIZATION	10.9	11.1	11.0	6.9	9.6	5.1
TRADITIONAL	10.9	9.6	5.0	14.2	3.1	7.8

SOURCE: CPS 1983, BFS 1989, AND BDHS 1993-94.

Profiles of Fieldworker Visitation Patterns: A Secondary Analysis of the Bangladesh Demographic and Health Survey 1993-94

Syed Jahangeer Haider, Noorul Islam, Shamsun Nehar Saleh

Introduction

Family planning fieldworkers are deployed by the Directorate of Family Planning, Ministry of Health and Family Welfare (MOHFW) and the NGOs. The government has deployed full time female workers, officially designated as Family Welfare Assistants (FWA). The FWAs work at the unit level (usually a ward is divided into two units). The job responsibilities of the fieldworkers primarily are: (1) to make home visits; (2) to render contraceptive services to eligible couples; (3) to ensure follow-up care to acceptors; and (4) to keep records of services and report performance routinely.

The sample in the 1993/94 BDHS includes 107 NGOfieldworkers (12 percent of the sample); of whom about 77 percent are deployed in the areas. Of the total sample of 791 FWAs (GOB fieldworkers), 80 percent are working in rural areas.

Distribution of GOB/NGO Fieldworkers

Fieldworker	Urban	Rural	Total
GOB NGO	160 (20%) 82 (77%)	631 (80%) 25 (23%)	791 (88%) 107 (12%)
Total	242 (27%)	656 (73%)	898 (100%)

Major Issues/Concerns

Despite efforts to extend and intensify the services of the fieldworkers, visitation remains low, covering only 38 percent of total eligible couples in 1993/94. Effective information as well as credible contact and support to non-users, dropouts and initial users are critical to enhance the level of acceptance and practice of FP, MCH and PHC services. At the present time, not only is visitation by fieldworkers limited, the quality of contact with clientele is also inadequate.

Scope and Focus of Analysis

BDHS data adequately cover performance of FWAs and NGO fieldworkers. Related concerns regarding fieldworkers' visitation include: (1) frequencies of visits and households covered; (2) clients contacted and time spent per client; (3) topics discussed and methods mentioned; (4) type of client

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visited - acceptors versus non-acceptors, high versus low parity couples, and newly married versus other couples; (5) management of side-effects and problems; and (6) level of fieldworker training.

Objectives

The primary objective of this study is to analyze the performance of fieldworkers (FW) who implement the home based delivery system of the FP-MCH program in Bangladesh. The specific objectives are: (1) assess fieldworker visitation patterns in terms of frequency and duration of contact nationally and by division; (2) ascertain the level of visitation and CPR achieved by client characteristics (currently married women) such as age, parity, and education; (3) assess the level of visitation and its relationship with CPR by types of client (e.g., users and non-users and urban and rural residency status); and (4) ascertain the level of visitation by socioeconomic characteristics of clients (measured by household type).

Design and Method of Analysis

The content of the current analysis focuses primarily upon the following issues: (1) data on visitation patterns by client characteristics, regions (divisions), and urban-rural classifications; (2) frequencies of visitation by area (size); (3) rates of visitation by urban and rural areas, by types of fieldworkers, clientele and services rendered - FP, MCH, and PHC. Frequency tables and cross tabulations are presented. Comparisons between dependent (visitation/outcome of services) and independent variables (client, fieldworker and aerial characteristics), are also investigated.

Two separate files, one for the currently married women sample and the other for fieldworkers are created. For currently married women, the CPR and visitation rates are estimated directly from client responses, while for fieldworkers, the CPR and visitation rates are estimated by taking average values for clusters to which fieldworkers are assigned. The estimated CPR and the visitation rates are comparable with those reported by 1993/94 BDHS findings. Results of the current analysis are collated and discussed for the "Women's file" and "Fieldworkers' file" separately.

Review of Findings from Other Studies

The 1993/94 BDHS data show that despite impressive coverage by family planning fieldworkers, household visitation rates remain low. In 1993/94, only 38 percent of currently married women said they had been visited by fieldworkers during the previous six months. It should be noted that visits to the household may underestimate the actual frequency of contact between fieldworkers and couples.

Fieldworkers are supposed to visit 20 households a day, or to complete their visitation cycle in two months time. It is necessary to determine the optimum number of households a fieldworker can visit daily, as well as the length of visitation cycle based on current work loads.

A recent study (PDEU, FHI and ACPR, 1996) reported that considerable scope exists to increase both the number of days and the hours per day that FWAs work. Currently, the cost per CYP for clinical methods is inflated due to costs of the home visitation program. FWAs spent about 11.8 days for home visits per month, contacting 19 clients per day. FWAs tend to visit oral contraceptives users more frequently, while giving lower priority to non-users and traditional method users.

An earlier PDEU study (1991) reported that 57 percent of women in high performing thanas as against 39 percent in low performing thanas reported that FWAs paid them visits. The status of visits to women by FWAs in these areas (high and low performing) is significantly different ($p<.001$). In other words, a higher frequency of visitation tends to yield a higher CPR.

The majority of FWAs claim that they are supported by rural leaders and older family members (NIPORT, 1994). They also have a positive image as an earning member of the family working for community development and welfare. A large number of FWAs recruited in 1976 have completed about 16 years of service. Currently FWAs are working at fifty percent capacity (working 4 hours a day) and they spend 16 days a month for home visitation. One FWA, on average, recruits 3 new acceptors per 16 working days for home visits. Out of 24 working days, FWAs spend 8 days for activities other than home visits.

An earlier workers' time study (ACPR, 1988) indicated that an FWA visited an average of 17.7 couples per day in EPI areas, while the average was 16.7 couples in non-EPI areas. With this rate of couple visits per day, an FWA would not be able to ensure regular bi-monthly visits even if the couple size is reduced to 800 per FWA.

Discussions and Findings: Women's Sample

Dhaka Division has the largest sample of currently married women within reproductive age (30.7 percent), followed by Chittagong (26.0 percent) and Rajshahi (24.3 percent). Barisal Division (with only 6.3 percent) has the smallest sample, while for Khulna Division it is 12.8 percent.

Visitation and Contraceptive Prevalence Rates

The distribution of currently married women by visitation and division produces statistically significant relationships.

1. Most of the currently married women in Chittagong (75 percent) and in Dhaka (60 percent) are from areas with low visitation rates (0-39 percent), while the majority of currently married women in Barisal (60 percent), Rajshahi (58 percent), and Khulna Divisions (61 percent) are from areas of medium (40-49 percent) and high (>50 percent) visitation;

Table 1: Distribution of Currently Married Women by Division

Division	Frequency	Percent
Chittagong	2334	26.0
Dhaka	2756	30.7
Barisal	567	6.3
Rajshahi	2178	24.3
Khulna	1145	12.8
Total	8980	100.0

2. In Rajshahi Division, currently married women are almost equally distributed between low (42 percent) and high (45 percent) categories of visitation; and

3. The distribution of currently married women in Khulna and Barisal is comparable: a little over one-third are from the low category and one-third from the high category, while one-fourth is in the medium category.

Table 1.1: Distribution of Currently Married Women by Status of Visitation in Last 6 Months

Visitation status	Frequency	Percent
Yes	3398	38.1
No	5521	61.9
Total	8919	100.0

Fewer currently married women in Chittagong division (29 percent) have been visited by fieldworkers in the last six months. Almost half of the currently married women in Khulna Division (49 percent) and little less than half (44 percent) in Rajshahi Division have been visited, followed by Barisal (41 percent) and Dhaka (35 percent).

Table 2: Distribution of Currently Married Women by Division and Rates of Visitation (CVRATE)

	Rates of visitation			Total	
Division	LOW 0-39%	MEDIUM 40-49%	HIGH 50% &Above	N	%
Chittagong	75	13	12	2334	100
Dhaka	60	21	19	2756	100
Barisal	40	27	33	567	100
Rajshahi	42	13	45	2178	100
Khulna	39	25	36	1145	100
National %	55.4	18.1	26.5	8980	100.0
N	4974	1624	2382		

Chi-Square Value with 8 df: 1038
Significance: .0000

About two-thirds (62-69 percent) of the currently married women visited by fieldworkers in the last six months in all divisions (except Chittagong) reported currently using contraceptives. Those who were not visited by fieldworkers reported a lower level of current use (34 percent) than those who were visited (62 percent). Irrespective of being visited by fieldworkers, the level of current practice is found to be higher among women in Rajshahi and Khulna Divisions than in Chittagong.

Table 2.1: Distribution of Currently Married Women by Visitation and Status of Method Use by Division

DIVISIONS	Visited				Not Visited				Total			
	Using		Not Using		Using		Not Using		Visited		Not Visited	
	n	%	n	%	n	%	n	%	n	%	n	%
CHITTAGONG	328	48	354	52	349	21	1281	79	682	29	1630	71
DHAKA	594	62	368	38	620	35	1156	65	962	35	1776	65
BARISAL	146	63	87	37	122	37	207	63	233	41	329	59
RAJSHAHI	660	69	297	31	533	44	679	56	957	44	1212	56
KHULNA	376	67	188	33	255	44	320	56	564	49	575	51
NATIONAL	2104	62	1294	38	1879	34	3643	66	3398	38	5522	62

Missing observations: 60

Nationally, the highest concentration of non-users (61 percent) is in areas with low visitation rates (0-39 percent). About one fifth (22 percent) reside in areas with high visitation levels (50 percent and above). Three-fourths (77 percent) of the non-users in Chittagong Division and about two-thirds (63 percent) in Dhaka Division are in areas with low visitation rates. In the other three divisions, the majority of non-users are in areas with medium and high visitation rates.

Table 2.2: Distribution of Currently Married Women by Rates of Visitation and by Status and Rates of Contraceptive Use by Division

Visitation Rate %	Chittagong		Dhaka		Barisal		Rajshahi		Khulna		National	
	USE	NU	USE	NU	USE	NU	USE	NU	USE	NU	USE	NU
0-39	66	77	55	63	37	43	39	45	37	42	49	61
40-49	15	13	22	21	29	25	13	12	26	24	19	17
50 & Above	16	10	23	16	34	32	48	43	37	34	32	22
Total	100	100	100	100	100	100	100	100	100	100	100	100

Nationally, more than half of all users were visited, while only one quarter of non-users were visited. Khulna Division has the highest rate of visitation, both among users (60 percent) and non-users (37

Table 2.3: Percent of Currently Married Women Distributed by Visitation and Status of Contraceptive Use Nationally and by Divisions

Area	User		Non-User	
	Not visited	Visited	Not visited	Visited
National	47	53	74	26
Chittagong	52	48	78	22
Dhaka	51	49	76	24
Barisal	46	54	70	30
Rajshahi	45	55	70	30
Khulna	40	60	63	37

percent). Comparatively, the rates of visitation among both users and non-users are 12 and 15 percent lower in Chittagong Division than in Khulna.

Visitation and contraceptive prevalence rates demonstrate strong positive and statistically significant relationships (with p <.0000). Increased levels of visitation (50+ percent) result in higher CPR levels. For example, 71 percent of the women living within areas of high visitation (50+ percent) reported CPRs of 50 percent or above, while only 29 percent of the women belonging to low levels of visitation (0-39 percent) reported CPRs of 50 percent and above. Comparatively, only 15 percent of women residing in areas with high visitation rates reported CPRs below 40 percent. Less than half (46 percent) of the women living in areas with low visitation achieved CPRs below 40 percent.

Table 2.4: Distribution of Currently Married Women by Visitation Rate and CPR

Visitation Rate	C P R			
	0-39%	40-49%	50% & HI	N
LOW 0-39%	46%	25%	29%	4974
MEDIUM 40-49%	24%	28%	48%	1624
HIGH 50% & ABOVE	15%	14%	71%	2382
Total	3046 (33.9)	2024 (22.5	3910 (43.5)	8980 (100)

The mean distribution of currently married women is almost uniform across levels of CPR within given categories of visitation; namely, low/medium/high. This confirms the earlier observation of a strong positive relationship between visitation and CPR.

Table 2.5: Mean Distribution of Currently Married Women by Visitation and CPR

Visitation Rate	CPR			Mean	N
	0-39%	40-49%	50% & above		
0-39%	21.01	28.28	27.58	24.70	4974
40-49%	43.96	43.25	43.99	43.77	1624
50% & above	61.13	57.78	61.95	61.25	2382
Mean	28.53	36.52	45.79	37.84	-
N	3046	2024	3910	-	8980

At the regional level, there are generally uniform relationships between visitation and contraceptive prevalence in terms of the mean distribution of currently married. However, two exceptions should be noted.

1. In Barisal Division, the mean distribution of women differs by at least 10 percent between visitation (24.85 percent) and CPR (33.13 percent) - for levels below 40 percent;
2. In Khulna Division, the mean distribution of women differs by at least 10 percent between visitation (71.40 percent) and CPR (60.61 percent) - for levels above 50 percent.

Such differences between visitation and CPR in Barisal and in Khulna may have occurred due to possible ineffectiveness of visitation affecting contraceptive use or due to strong presence of contraceptive supply sources other than fieldworkers (market sources).

Table 2.6: Mean Distribution of Visitation Rates and CPR of Currently Married Women by Division

Division	C V R A T E			C P R		
	<40%	40-49%	>49%	<40%	40-49%	>49%
Chittagong	22.13	44.44	56.96	22.49	43.20	53.73
Dhaka	24.78	43.37	57.31	28.67	45.06	58.13
Barisal	24.85	44.70	58.25	33.13	45.47	55.98
Rajshahi	25.48	43.78	60.91	28.88	44.88	61.12
Khulna	32.78	43.37	71.40	34.94	44.52	60.61
Total	24.70	43.77	61.25	25.59	44.65	59.30
N	4974	1624	2382	3046	2024	3910

CVRATE: Visitation rates of the currently married women.
CPR: Contraceptive Prevalence Rates.

Visitation and Intervals

Of those who had been visited, most users were visited by an interval of either 2 or 3 months, while the majority of non-users had last been visited in 4-6 months. Most of the visits occurred within 2 months of the last visit. This is true irrespective of levels of visitation. This conforms to fieldworkers' standard household visitation schedule of once every two months.

Table 3: Percent of Currently Married Women distributed by CPR and Months since Last Visit of FWs Nationally and by Divisions

Areas	0-2 months		3 months		4-6 months	
	Non user	User	Non user	User	Non user	User
National	37	63	40	60	59	41
Chittagong	51	49	50	50	73	27
Dhaka	38	62	34	66	54	46
Barisal	37	63	29	71	55	45
Rajshahi	29	71	43	57	67	33
Khulna	32	68	42	58	30	70

Table 3.1: Distribution of Currently Married Women by Rates of Visitation by Months Passed since Last Visit

Visitation rate	0-2 months	3 months	4-6 months	Total	N
0-39%	87.0	8.0	5.0	100	1459
40-49%	88.0	70.0	40.0	100	776
50% & above	94.0	40.0	20.0	100	1536

Visitation by Age

Most of the currently married women aged between 10-19 (adolescents) both nationally (71 percent) and by divisions (60-84 percent) were not visited by fieldworkers in the last six months. Of these women, 71 percent were not visited nationally, while more than three-fourths in both Chittagong and Dhaka Divisions, and about two-thirds in other divisions were not visited by fieldworkers. Most of the women aged 30 and above were not visited by fieldworkers: national level (65 percent) and in divisions (59-70 percent).

The percentage visited is higher in age groups 20-24 and 25-29 than in age groups below (<20) or above (>29). In the age groups 20-24 and 25-29, both in Rajshahi (51 and 54 percent) and in Khulna (63 and 62 percent), the majority of women were visited.

Table 4: Percent of Currently Married Women distributed by Visitation and Age Nationally and by Divisions

Areas	10-19 Years		20-24 Years		25-29 Years		30+ Years	
	Not visited	Visited	Not visited	Visited	Not visited	Visited	Not visited	Visited
National	71	29	57	43	53	47	65	35
Chittagong	84	16	72	28	61	39	70	30
Dhaka	76	24	61	39	57	43	67	33
Barisal	64	36	54	46	48	52	64	36
Rajshahi	63	37	49	51	46	54	62	38
Khulna	60	40	37	63	38	62	59	41

CPR and Age

Irrespective of age and levels of average cluster CPR, current use of contraception increases systematically. The proportion of non-users is much higher among currently married women aged below 20: nationally (75 percent) and by divisions (87-64 percent). However, the proportion of non-users among currently married women aged below 20 in Chittagong (87 percent) and in Dhaka (81 percent) are much higher than in other divisions (64 percent-69 percent). In all divisions except Chittagong, the proportion of users among women aged 25 and above is more than 50 percent, while in Chittagong Division, it ranges between 30-37 percent.

Table 4.1: Percent of Currently Married Women distributed by CPR and their Age Nationally and by Divisions

Areas	10-19 Years		20-24 Years		25-29 Years		30+ Years	
	User	Non user	User	Non user	User	Non user	User	Non user
National	75	25	62	38	49	51	48	52
Chittagong	87	13	76	24	70	30	63	37
Dhaka	81	19	65	35	47	53	46	54
Barisal	69	31	63	37	43	57	46	54
Rajshahi	68	32	51	49	35	65	37	63
Khulna	64	36	51	49	37	63	38	62

Visitation and Education

At the national level, the rates of visitation rose by 7 to 9 percent among those who completed 'primary' and 'secondary' education compared to those with 'no education'. Levels of education influence visitation by fieldworkers; specially, the differences on visitation are higher between those 'not educated' (national: 35 percent; divisions: 27-47 percent) and those completing 'primary' (national: 42 percent and divisions: 32-49 percent) and 'secondary' (national: 44 percent and divisions: 37-56 percent) levels. However, the differences on visitation are not as great for those completing primary and secondary levels of schooling.

Table 5: Percent of Currently Married Women distributed by Visitation and their Level of Education Nationally and by Divisions

Areas	No education		Primary		Secondary	
	Not visited	Visited	Not visited	Visited	Not visited	Visited
National	65	35	58	42	56	44
Chittagong	73	27	68	32	63	37
Dhaka	68	32	60	40	60	40
Barisal	69	31	54	46	53	47
Rajshahi	58	42	53	47	50	50
Khulna	53	47	51	49	44	56

CPR and Education

Although visitation rates across most levels of education is less than 50 percent, the rate of current use of contraception was higher than 50 percent only for women who completed secondary and above.

In both Khulna and Rajshahi Divisions, current use is higher than 50 percent irrespective of levels of education, while in Chittagong Division, the rate of use is lower than 50 percent for all education levels.

The level of education influences both visitation rates and CPR positively; but the influence on CPR is a little higher. However, the influence of secondary or higher levels of education compared to lower levels (primary incomplete or completed) on both visitation and CPR is still higher. This holds true for national and divisional levels. At the national level, for women with no education, nearly two-thirds (65 percent) are not visited. About one-half (56 percent) of women with secondary education or higher fall in the same not visited category. At the national level, the majority of women (59 percent) with no education are non-users, but in the case of women with secondary education or more this is reversed and the majority are users (58 percent).

Table 5.1: Percent of Currently Married Women distributed by CPR and their Level of Education Nationally and by Divisions

Areas	No education		Primary		Secondary	
	Non user	User	Non user	User	Non user	User
National	59	41	55	45	42	58
Chittagong	74	26	70	30	58	42
Dhaka	61	39	55	45	41	59
Barisal	60	40	54	46	38	62
Rajshahi	47	53	44	56	38	62
Khulna	46	54	47	53	39	61

Divisional comparisons of visitation by levels of education reveal that in Chittagong, Dhaka and in Barisal Divisions, irrespective of the levels of education, the majority of currently married women are not visited. In Rajshahi Division, half of the women and in Khulna Division the majority (56 percent) having education at secondary or higher level are visited. Overall, visitation rates in Chittagong Division are comparatively low across levels of education.

Table 5.2: Percent Distribution of Currently Married Women Comparatively by Visitation rates and CPR by Levels of Education

Divisions	No education		Secondary or higher	
	Visitation	CPR	Visitation	CPR
Chittagong	27	26	37	42
Dhaka	32	39	40	59
Barisal	31	40	47	62
Rajshahi	42	53	50	62
Khulna	47	54	56	61

Visitation rates between those with no education and those with secondary or higher education differ in the range of 8 to 10 percent in all divisions, except Barisal, where the difference is 16 percent. The CPR between those with no education and those with secondary or higher education varies by 16 percent, 20 percent and 22 percent respectively for Chittagong, Dhaka and Barisal Divisions; but for Rajshahi (9 percent) and Khulna (7 percent) it is less than 10 percent. Both in Khulna and Rajshahi Divisions, fieldworker effort has somewhat neutralized the effect of education in achieving higher rates of visitation and CPR.

Visitation and Parity

Khulna Division had the highest rate of fieldworker visitation, irrespective of the size of the living parity of the couples, while Chittagong Division achieved the lowest rate. In Khulna Division, more than one fourth (28 percent) of the couples with no children were visited by fieldworkers, while in Chittagong Division it is about one-tenth. For other divisions the rate is around one-fifth. Again, more than half of the couples in Khulna with 1-2 children were visited by fieldworkers, while in Chittagong Division a little less than one third were visited. It is also evident that in high performing divisions, such as Rajshahi and Khulna, rates of visitation are highest for the first and second parities.

Table 6: Percent of Currently Married Women distributed by Visitation and their Number of Living Children Nationally and by Divisions

Areas	No Child		1-2 Child		3+ Child	
	Not visited	Visited	Not visited	Visited	Not visited	Visited
National	82	18	57	43	60	40
Chittagong	89	11	69	31	67	33
Dhaka	84	16	62	38	62	38
Barisal	80	20	54	46	57	43
Rajshahi	79	21	51	49	54	46
Khulna	72	28	42	58	52	48

CPR and Parity

Rates of use of contraception increased by parity. However, more than one-fifth of couples without any children in Khulna and Barisal Divisions reported using contraceptives, while the same rate for all other divisions varies between 9 percent in Chittagong and 15 percent in Rajshahi and Dhaka Divisions. The data clearly show that highest rates of use have occurred in cases of couples having 3 or more living children.

Table 6.1: Percent of Currently Married Women distributed by CPR and their Number of Living Children Nationally and by Divisions

Areas	No Child		1-2 Child		3+ Child	
	Non user	User	Non user	User	Non user	User
National	86	14	57	43	46	54
Chittagong	91	9	75	25	63	37
Dhaka	85	15	60	40	44	56
Barisal	80	20	54	46	45	55
Rajshahi	85	15	45	55	34	66
Khulna	76	24	46	54	35	65

Visitation and CPR by City, Towns, and Villages

Comparatively, visitation rates in cities are lower than in towns in Chittagong and Dhaka Divisions. It is surprising that the CPR of Chittagong city is lower than in the towns of the same division, while the CPR of Dhaka city is much higher than in towns and villages within Dhaka Division. The reason for this may be that people in Dhaka city tend to be more educated and they are more exposed to multiple sources of information and family planning supplies. In general, visitation rates are higher in towns than in villages.

Table 7: Percent of Currently Married Women distributed by Visitation and Residence Nationally and by Divisions

Areas	City*		Town**		Village	
	Not visited	Visited	Not visited	Visited	Not visited	Visited
National	61	39	51	49	63	37
Chittagong	64	36	57	43	72	28
Dhaka	61	39	53	47	66	34
Barisal	-	-	77	23	57	43
Rajshahi	-	-	55	45	56	44
Khulna	-	-	38	62	53	47

* BDHS sample only included 2 cities: Dhaka and Chittagong.

** Towns include the SMAs and the Municipal Areas.

Table 7.1: Percent of Currently Married Women distributed by CPR and their Residence Nationally and by Divisions

Areas	City		Town		Village	
	Non user	User	Non user	User	Non user	User
National	45	55	47	53	57	43
Chittagong	59	41	53	47	72	28
Dhaka	40	60	48	52	59	41
Barisal	-	-	48	52	53	47
Rajshahi	-	-	46	54	45	55
Khulna	-	-	46	54	44	56

Visitation by Type of Methods Used

The highest rates of visitation have occurred for users of contraceptives that are principally delivered by fieldworkers at the domiciliary level, followed by semi-permanent methods (IUDs and injectables). The rate of visitation (reflecting routine visitation, not just initial contact) is very low for users of sterilization (only 12 to 15 percent). The reason for not visiting sterilization acceptors routinely is obviously on the ground that they are permanent method users. The lower rates of visitation with traditional method users may be explained by the fact that workers are not encouraged to disseminate information on traditional methods.

Table 8: Distribution of Currently Married Women using Methods by Status of Visitation

Areas	Condom & Pill		IUD & Injection		Sterilization		Traditional Method	
	Not visited	Visited	Not visited	Visited	Not visited	Visited	Not visited	Visited
National	26	74	40	60	87	13	61	39
Chittagong	32	68	43	57	85	15	66	34
Dhaka	31	69	48	52	87	13	67	33
Barisal	27	73	45	55	86	14	46	54
Rajshahi	22	78	30	70	88	12	61	39
Khulna	20	80	32	68	86	14	51	49

Visitation by Status of Experiencing Side-Effects

Irrespective of the status of experiencing side-effects or not, the probability of a user being visited by fieldworkers is comparable. Only in Khulna Division did women who experienced side-effects report higher rates of visitation (67 percent) than women who did not report side-effects (57 percent).

Table 9: Percent of Currently Married Women distributed by Visitation and Status of Experiencing Health Problems (Side-Effects) due to Use of Contraceptives Nationally and by Divisions

Areas	Side-effects		No side-effects	
	Not visited	Visited	Not visited	Visited
National	47	53	47	53
Chittagong	46	54	54	46
Dhaka	54	46	50	50
Barisal	47	53	45	55
Rajshahi	46	54	44	56
Khulna	33	67	43	57

Mobility and Status of Visitation and Use

In both Rajshahi and Khulna Divisions, levels of visitation by fieldworkers and mobility of currently married women are not related. The status of being visited or not-visited is almost comparable among women irrespective of their levels of mobility: unrestricted, restricted and no mobility. However in Chittagong, Barisal and in Dhaka Divisions, women with 'no mobility' are less likely to be visited by fieldworkers. Stringency of cultural practices prohibiting mobility of women often is a major impediment to external contacts with family members. Contrary to visitation rates, the CPR is significantly ($P < .00$) related to mobility of women. Greater levels of mobility lead to higher rates of CPR. Both nationally and across divisions, except in Chittagong Division, the majority of women with 'unrestricted mobility' are currently practicing contraceptives (57-67 percent). In Chittagong Division, a little less than half (44 percent) of women with unrestricted mobility reported currently using a method - and the CPR falls drastically among women with restricted mobility (28 percent) and with no mobility (9 percent).

Table 10: Percent of Currently Married Women distributed by Rates of Visitation and Mobility of going outside Nationally and by Divisions

Areas	Unrestricted Mobility		Restricted Mobility		Absence of Mobility	
	Not visited	Visited	Not visited	Visited	Not visited	Visited
National	60	40	62	38	67	33
Chittagong	65	35	70	30	86	14
Dhaka	63	37	65	35	76	24
Barisal	56	44	58	42	70	30
Rajshahi	56	44	56	44	57	43
Khulna	50	50	51	49	51	49

Table 10.1: Percent of Currently Married Women distributed by CPR and their Mobility of Going Outside Nationally and by Divisions

Areas	Unrestricted Mobility		Restricted Mobility		Absence of Mobility	
	Non user	User	Non user	User	Non user	User
National	43	57	57	43	71	29
Chittagong	56	44	72	28	91	9
Dhaka	43	57	59	41	70	30
Barisal	35	65	55	45	58	42
Rajshahi	33	67	46	54	60	40
Khulna	38	62	42	58	67	33

Discussion and Findings:

The BDHS 1993-94 was conducted in 301 selected clusters (sampling points). The current analysis is undertaken with 902 full time fieldworkers, selecting on average 3 fieldworkers from each cluster/sampling point. Average CPR and the visitation rate for each cluster are estimated and used for comparative analysis in this section. Of the 902 fieldworkers, 791 (88 percent) are GOB fieldworkers (FWAs), while the rest are NGO workers (12 percent).

The number of hours spent for field visits, households visited and clients contacted have been reported by fieldworkers in the 1993/94 BDHS survey. Estimates of average total hours spent for field visits per year have been calculated considering the total length of service (transformed into total hours and divided by the number of years served). The corresponding average number of households visited and clients contacted per year by fieldworkers are shown in Table 11. On the basis of annual averages, estimates of households visited and clients contacted are made by eight hourly units, the usual length of time that a fieldworkers is expected to work in a day.

Table 11: Number of Hours Spent in the Field, Households Visited and Clients Contacted by the Fieldworkers Annually (Yearly Average) by Divisions

Division	Yearly Average			8 Hourly Average	
	Hours spent for field visit	Household visited	Client contacted	Household visited	Eligible client contacted
Chittagong	1722	5206	1665	24	8
Dhaka	1695	5528	2335	26	11
Barisal	1599	4815	1968	24	10
Rajshahi	1844	5625	2756	24	12
Khulna	1796	5969	2542	27	12
National	1740	5462	2261	25	10

Fieldworkers in Chittagong Division reported the lowest number of households visited (24) and lowest number of clients contacted (8) per eight hour day. Although the fieldworkers of Rajshahi Division reported the lowest number of households visited per eight hour day, the number of clients contacted by fieldworkers per eight hour day is the highest (12). The fieldworkers of Khulna Division reported the highest number of households visited (27) and clients contacted (12) per eight hour period.

About 28 percent of the fieldworkers contacted less than 31 clients per week, and 32 percent contacted more than 60 clients. Little less than half (45 percent) of fieldworkers contacting on average less than 31 clients per week are from sample clusters achieving CPRs of less than 40 percent, while 51 percent of fieldworkers contacting more than 60 clients per week are from clusters achieving CPRs of 50 percent or more.

Among fieldworkers interviewed in the 1993/94 BDHS, 15 percent reported not having received any refresher training. Seventy-one percent of the fieldworkers receiving refresher training are from areas/clusters representing CPRs above 40%. In other words, refresher training appears to be highly correlated with fieldworker performance.

Implications

Visitation: Factors and Trends

Logistic regression analysis has been performed with visitation (visit=1 and not visit = 0) as the dependent variable and 17 independent variables (results of this logistic regression analysis is attached in Appendix).

Visitation by division confirms the findings of the BDHS report. It shows that visitation is highest in Khulna Division (the reference division), followed by Rajshahi (the odds of being visited equals 64 percent); Barisal (61 percent); Dhaka (45 percent); and Chittagong (37 percent). These findings are significant at the level of $p < .000$.

Visitation in urban areas has a higher probability (131%; odds ratio: 1.31; $p < .0032$) than in rural areas. Increases in age raise the probability of visitation, but when computed by age square the probability falls below the ratio of 1 and the relationship is negative (indicating that visitation increases with age for women under 30 years of age, but begins to decline among older women). Similarly, for the number of living children, increasing visitation is observed for women with 1-2 living children, while for higher parity mothers visitation starts declining/plateauing (except in Chittagong Division).

Education influences the level of visitation. Women with more education are more likely to be visited (odds ratio: 1.02; $p < .01$). Visitation is also found to increase with greater exposure to radio (odds ratio: 1.27; $p < .0000$). The probability of visitation is higher among respondents stating that 0-2 children are ideal compared to women who say that having three or more children is ideal (odds ratio: 1.18; $p < .00$). In the case of greater spousal communication and approval of FP, respondent visitation rates also increase (odds ratio 1.92 and 1.88; $p < .00$).

Refresher training of fieldworkers is a contributing factor in enhancing the rates of visitation. Fieldworkers who received refresher training had significantly higher levels of visitation (odds ratio: 1.13; $p < .03$).

This analysis confirmed that young women (10-19 years) are less likely to be visited than their older counterparts. About one-third of the women below age 20 nationally, and more than one-third in Barisal, Rajshahi and Khulna Divisions were visited by fieldworkers. Nationally, only 18 percent, while in Chittagong Division about one-tenth and in Dhaka Division about one-sixth of the women without children were visited by fieldworkers. Khulna Division reported much higher visitation rates for women without children (28 percent) followed by Rajshahi Division (21 percent).

Visitation and CPR

Fieldworker visitation as a factor influencing contraceptive use is well documented in the current study. One of the major findings is that about two-thirds of the women who were visited by fieldworkers reported currently practicing a method, while only one-third of women not visited reported the same. Mean scores of CPR compared with levels of visitation (low: 0-39; medium: 40-49; and high 50% and above) demonstrate a striking linear relationship (positive) ($p < .00$):

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Logistic Regression Estimates for Selected Covariates Associated with Visitation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
DIVISION			118.7522	4	.0000	.1094	
CHITTAGONG	-.9813	.1001	96.1215	1	.0000	-.1008	.3748
DHAKA	-.7908	.0937	71.3002	1	.0000	-.0865	.4535
BARISAL	-.5021	.1320	14.4671	1	.0001	-.0367	.6053
RAJSHAHI	-.4436	.0955	21.5600	1	.0000	-.0460	.6417
TYPE(URBAN)	.2713	.0921	8.6829	1	.0032	.0269	1.3117
AGE	.2002	.0258	60.4097	1	.0000	.0794	1.2216
AGE2	-.0041	.0004	101.9968	1	.0000	-.1039	.9959
LIV CHILD	.3644	.0478	58.1276	1	.0000	.0779	1.4397
LIV CHILD2	-.0165	.0055	9.0405	1	.0026	-.0276	.9837
EDULEVEL	.0235	.0095	6.1195	1	.0134	.0211	1.0238
HEALTH	.0990	.0758	1.7039	1	.1918	.0000	1.1040
MOBILITY							
SHOPPING	-.1678	.0759	4.8900	1	.0270	-.0177	.8455
MOBILITY							
ROOF(1)	-.0962	.0596	2.6025	1	.1067	-.0081	.9083
RADIO EXP	.2362	.0563	17.5825	1	.0000	.0410	1.2664
TV EXP	-.0285	.0804	.1262	1	.7224	.0000	.9719
IDEAL NO	.1646	.0571	8.3237	1	.0039	.0261	1.1789
CHILDREN							
RFRESHER'S TRAINING			5.6033	2	.0607	.0132	
RTRAIN(1)	-.1641	.1823	.8097	1	.3682	.0000	.8487
RTRAIN(2)	.1206	.0579	4.3321	1	.0374	.0159	1.1281
SPOUSAL	.6505	.0748	75.5297	1	.0000	.0891	1.9164
COMMUNICATION							
RESPONDENT	.6303	.2229	7.9965	1	.0047	.0254	1.8782
APPROVAL							
HUSBAND'S	.0720	.0614	1.3752	1	.2409	.0000	1.0747
OCCUPATION							
Constant	-4.2205	.4275	97.4601	1	.0000		

Spatial Variation in Contraceptive Method Use in Bangladesh

Ian Diamond, Pete Tonkin, APM Shafiur Rahman, Sk. Ali Noor

Introduction

The major proximate determinant influencing the rapid decline in fertility in Bangladesh in the 1980s and 1990s has been contraception. Over the sixteen years to the Bangladesh Demographic and Health Survey (BDHS) in 1993/94, contraceptive use rose from around 8% of currently married women in 1978 to around 45%. Such a marked increase has been the subject of much research with many commentators speculating as to its cause. Although some have argued for an economic explanation (e.g., Thomas, 1991) probably the most pervasive arguments have come from Cleland et al (1994) who conclude that the strong family planning programme, in place for over 20 years, has played a crucial role in individual decisions to use contraception.

However, despite the impressive gains in contraceptive use in the past 16 years there remains high variation across geographical areas in Bangladesh. These variations have been observed, for example by Huq and Cleland (1990), but the reasons for this diversity have been studied much less. Amin, Diamond and Steele (1996) ascribe some of the regional variation to levels of religious practice and to education. Religious conservatism has also been proposed as a possible cause by Huq and Cleland (1990) and Balk (1994) has suggested that such an effect may also exist for fertility. Although there is little research on education as a predictor of regional variation in contraceptive use in Bangladesh, the possibility that mass education can act as a conduit for fertility decline is not a new one and has been addressed by many authors since Caldwell (1980). In a recent review, Diamond, Newby and Varle (1996) argue that it could be a major reason for fertility decline by giving women both access to messages from family planning programmes and the autonomy to take advantage of the availability of contraception.

While education can be an important reason for an upsurge in the demand for contraception, it is obvious that the demand can only be met if there is an adequate supply of family planning. Numerous surveys under the auspices of the Demographic and Health Surveys programme have shown there to be large unmet need for family planning. In this survey it is estimated that almost 20% of currently married women aged 10-49 have an unmet need. While there are many reasons for this unmet need, it is likely that regional variations in family planning availability are an important contributory factor. Although there are variations by division (Mitra et al. 1994) it is likely that below division, at district and subdistrict levels, local norms and values may hinder or enhance the programme and hence there will be intra-district variation. It should be noted that there is likely to be spatial correlation between the availability of family planning services and the socioeconomic and cultural characteristics of the various geographical areas. For example, Amin, Diamond and Steele (1996) argue that religious

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conservatism in an area can act as a barrier to contraceptive uptake by influencing women's autonomy and making it difficult for the programme to hire field workers. Therefore in the analysis in this chapter, the family planning programme is seen as an intermediate variable through which socioeconomic and cultural factors can act to influence contraceptive use.

Although the emphasis in this chapter is on spatial variations in contraceptive use, it is important to consider also the individual factors which influence contraceptive use. The reasons for this are simple: contraceptive use is a decision taken by a woman, usually in consultation with her husband and that decision is likely to be influenced by the woman's individual characteristics, such as her education or the current sex composition of her family. However the decision for a woman with a particular set of individual level characteristics is likely to be influenced by community factors such as the availability of a community health worker or the distance to the district headquarters. For example, a woman with no education in a thana which is a long way from the district headquarters may have a remote chance of receiving many family planning messages or of regular visits from a family planning worker. On the other hand, a woman with a similar lack of schooling but living very close to the district headquarters may have a marked increase in her chance of using contraception, due perhaps to more liberal community norms and increased access.

For these reasons it is essential that an analysis to investigate regional variations in contraceptive use consider both individual and community level data contemporaneously. This approach, known as multilevel modeling, has been acknowledged as important for many years (e.g., Casterline 1985) but it is only in recent years that it has been both technically possible and that suitable data have been available. Recent applications of multilevel models to contraceptive and health data include Amin, Steele and Diamond (1996); Steele, Diamond and Amin (1996) and Steele, Diamond and Wang (1996).

This chapter will first introduce the data, then describe the methodology and finally provide an overview of the factors influencing contraceptive use and choice in Bangladesh.

Initial Analyses

There is a wide variety of contraception available in Bangladesh. Mitra et al. (1994) report that over 50% of communities have access to pills, condoms and family planning injections. However, the methods used by women are more concentrated towards one major method - the pill. This may reflect choice but is also likely to reflect access to supplies and the attitudes of providers. This has been commented on in a very different context by Cooper, Diamond and High (1992) who observed that, in Southern England, teenage women almost always received a pill.

Table 1 gives a breakdown of current method use at the time of the survey by Division and by age. With the exception of Chittagong (52%), over 60% of modern reversible method users in each division were using the pill. Pill use is particularly common among women in their twenties while at older ages sterilization, particularly female sterilization is more common. However it should be stressed that this is a function of sterilization being common in the late 1980s. In the 1990s there has been very little emphasis on sterilization and uptake is very low. As a result very few relatively young women will be sterilized.

Given the predominance of pill use and the possibility that, for all modern reversible methods (pills, condoms, family planning injections and IUDs) a woman's choice may be predicated by the local supply and the preference of her provider, in this chapter the four methods listed above are grouped under the abbreviation `modern' methods. Similarly, female and male sterilization are grouped together as `sterilization' and periodic abstinence, withdrawal and other traditional methods as traditional'.

Table 2 provides a breakdown of contraceptive use for a number of individual and community level characteristics. More detailed basic information is found in Mitra et al. (1994). The table contains no major surprises. Modern method use increases with education, is higher in urban as opposed to rural areas, among women who would have liked to have delayed or foregone a recent child and who had some autonomy. It is also higher among women who live relatively close to a thana or district headquarters and where a family planning worker visits the village. The key question is the extent to which these characteristics are important predictors of method use when considered net of each other. This is considered in the subsequent multivariate analysis.

Multilevel Methodology

As indicated in Section 1, an analysis of spatial variation in contraceptive method use requires a multilevel approach for both methodological and substantive reasons. On the methodological side, classical regression techniques are inappropriate when the data are clustered in some way because the fundamental assumption of independence is violated. Substantively, people's behavior is often influenced by the socioeconomic and cultural characteristics of the place in which they live and by the availability of services in that area. Therefore, considering the data in a hierarchical manner reflects reality much better.

The variable of interest for this analysis is the current method of contraception being used. As described in Section 2, this is a categorical variable with four categories: modern reversible method; sterilization; traditional; and no use. To analyze a variable such as this, a multilevel multinomial logistic regression is used. In this analysis, a three level model is used where individual women (level 1) are nested within primary sampling units (PSU, level 2) and then within districts (level 3). These PSUs are local communities and correspond to villages in rural areas and mohalla in urban areas. The model to be fitted takes the following form:

$$\ln\left(\frac{P_{rijk}}{P_{bijk}}\right) = x'_{ijk}\beta + w'_{jk}\gamma + z'\eta + u_{jk} + v_k$$

where $\ln(p_{rijk}/P_{bijk})$; with $r = 2,3,4$ is the natural log of the probability of being in category r for woman I in PSU j in district k relative to being in a baseline category b. In this case, three equations are required to be estimated - one for each of the contrasts between a particular category (of the four methods of contraception) and the baseline; where x_{ijk}, w_{jk} and z_k are vectors of individual, PSU and district level characteristics, respectively and where β, γ, and η are vectors of the estimated parameter coefficients. $u_{jk}(\sim N(0,\sigma^2 u))$ and $v_k(\sim N0,\sigma^2 u)$ are error terms at the PSU and district level respectively. The purpose of this approach is to control for the correlation between women in a particular PSU or

district and the error terms ujk and vk give an indication of the variation after controlling for the individual level characteristics. The general framework is described in Goldstein (1995) and is developed in a demographic context in Steele, Diamond and Wang (1996). The model can be estimated using iterative generalized least squares by adapting the software package MLn (Rasbach and Woodhouse, 1995).

The estimate of the level three residuals vk can be used to predict `district effects'. These give the effect of the district in which the woman lives on her chance of using a particular method of contraception, after controlling for a range of observed individual and community level variables. The `district effect' thus represents some characteristics of the district which have not been observed (or in some cases may be unobservable) but which mean that the district has rather higher or lower use of a particular method than would be expected. Aitkin and Longford (1986) show how these can be used to obtain adjusted rankings of districts according to their average contraceptive prevalence rates.

Amin, Diamond and Steele (1996) and Steele, Diamond and Amin (1996) show how to use a procedure proposed by Goldstein and Healy (1995) to construct simultaneous confidence intervals to test for differences between any pair of districts where the significance level averaged across any possible pairs is equal to the specified value. If two confidence intervals do not overlap then there is said to be a statistically significant difference between the two districts.

Results

Individual Level Variables

The model described in Section 3 is estimated using the variables introduced in Table 2 as predictors of use of one of the four types of method. These predictors are chosen to reflect the individual and community variables which were (a) considered from previous research to be potentially useful predictors of contraceptive use; and (b) collected in the BDHS survey. The results are displayed in Tables 3 and 4. Table 3 displays the parameter estimates and standard errors of the best model and Table 4 the estimated probabilities of using a particular method type for a woman with a particular characteristic. These estimated probabilities for a particular variable are calculated by holding the values for all other variables constant at the mean and then transforming the three estimated equations. They are presented because they are more easily interpretable than the parameter estimates.

The individual level variables are first considered. With regard to age, there is an expected relationship with modern method use being higher among women in their twenties and thirties and lower in their forties. Sterilization is more common among older women. There are two possible reasons for this. First, one would clearly expect sterilization to be more popular among older women as it cannot be used for spacing. Second, there was a strong ethos in the programme towards sterilization in the late 1980s (Cleland and Mauldin, 1991) which, as a result partly of pressure from donors was reduced in the 1990s. As shown by Steele and Diamond (1996), there was relatively little incidence of sterilization in the six years to the BDHS. Thus sterilization will tend to be even more pronounced among older women as the supply of this method of birth control to young women will have been reduced in the 1990s.

In Bangladesh there is strong son preference (Choe et al. 1997). The impact of this son preference on contraceptive use can be seen clearly from the family composition variable which shows that for any particular family size the probability of using a modern reversible method, of being sterilized or of using a traditional method is raised if there is at least one boy and is lowered commensurately if there is no boy.

The woman's education is also important. Use of modern reversible methods increases monotonically with education being highest among secondary educated women. However, use of sterilization takes a rather different pattern, being highest among women with no education. This reflects the characteristics of women targeted by the programme for sterilization in the 1980s. Traditional method users are also more likely to be women with higher education. This could reflect a greater awareness of these methods or, possibly, it could reflect responses to questions about contraception in a society where contraceptive use is now often the norm. Educated women not using contraception may choose to eport use of a traditional method when they are actually not using a method because it is more difficult for an interviewer to disprove use.

The above results for education are supported by those for the woman's region of residence. The strength of the programme in rural areas is reflected by the similarity in the probabilities between urban and rural dwellers. For example, there are no statistically significant differences between urban and rural dwellers.

An important indicator of a woman's use of contraception is whether or not her last child (if it was born recently) was desired at that time, or even at all. Those women who wanted no more children before they had their last child are markedly more likely to be using a modern reversible method of contraception than those who either (a) wanted their last child at that time or (b) would have preferred to have waited. However, almost half of those women who reported they did not want any more children are not using contraception, suggesting that there remains some unmet need. It is also interesting that those women who report that they would have preferred to have waited have the same probability of using a modern method as those who had wanted their previous child at that time. This is worthy of further research and may suggest that although women would prefer to delay, cultural forces - for example, pressure from a mother-in-law - may result in them not using contraception when they would prefer to. In the area of health, Steele, Diamond and Amin (1996) have found evidence for such effects in rural Bangladesh.

Autonomy has been shown many times to be an important catalyst for demographic change (see for example, Jejeebhoy, 1995). Two variables reflect autonomy in this study: whether the woman was allowed to go out alone and whether she works for cash. The latter does not prove to be a good predictor, perhaps reflecting the diverse nature of cash employment in Bangladesh. However, the former is an important predictor: women who are able to go out alone are rather more likely to use a modern reversible method than their counterparts who are not allowed out of the home.

Contextual Effects

An important feature of the multilevel modeling used in this chapter is that it permits both individual and community level variables to be considered concurrently in a statistically sound analysis. Four

community variables were considered as potential predictors of contraceptive method mix: two indicators of the community's accessibility (distance to thana headquarters and distance to district headquarters); a measure of contraceptive supply (whether or not a family planning worker visits and provides information and methods); as well as an index of norms and values for education (the proportion of people in the district with at least primary education). This latter variable had some effect as a predictor in the work on the 1989 Bangladesh Fertility Survey by Amin, Diamond and Steele (1996). Sadly, though, the more important community variable in their study - level of religious practice - was not available in this study.

To turn first to `accessibility', it is clear that those women who lived close to a district or than a headquarters are rather more likely to use modern methods regardless of their individual characteristics. The key variable here is the distance to the thana headquarters, which is more important than the distance to district headquarters : women living very close to the headquarters are much more likely to use a modern method of contraception than their counterparts who live in more remote areas (20 kms away). This could reflect both supply - fieldworkers may be less likely to travel a long way from the thana headquarters - and culture, as the distance from the thana headquarters increases. The impact of `accessibility' on modern method use is even more clear when one observes (Table 3) that the accessibility variables are not significant for either of the contrasts between traditional method and non-use, or between sterilization and non use.

Supply, as defined by whether the fieldworker visits the community, is also extremely important in that women in the small number of communities which did not receive visits from the fieldworker were much less likely to use modern methods. It should also be stressed here that the overwhelming majority of communities have a fieldworker. However, the lower level of uptake for the small minority without a fieldworker is indicative, perhaps, of a group of the population with special needs who are being underserved by the family planning programme. Although this is important, the unexplained district and community level variation discussed in the next section suggests that there remains some heterogeneity in supply across the districts. However, this cannot be studied properly using these data but is an important area for future research.

With regard to the proportion without least primary education, there is no significant impact on traditional method use or sterilization. However, there is a positive, although only marginally significant, impact on community levels of education on modern method use. This supports the results of Amin, Diamond and Steele (1996) who argue that, following Caldwell (1980), communities with a high overall level of education will have an impact on the probability of a woman using contraception, regardless of her own level of education.

Finally, a higher level of aggregation is considered: division. Even after controlling for the individual, community and district level socioeconomic and cultural characteristics described above, there remain marked divisional differences. Modern reversible method use is higher in Khulna and Rajshahi than elsewhere and much lower in Chittagong. There are relatively few differences in the other methods and, of course, non-use is much higher in Chittagong. These divisional differences will reflect demand as indicated by the socioeconomic and cultural characteristics as well as differences in supply. Indeed, supply will also be influenced by culture as discussed by Amin, Diamond and Steele (1996). To understand further the true cause of these divisional differences is beyond the scope of these data but should remain an important issue on any research agenda.

Unobserved Contextual Variation

In addition to the variation observed across the categories of the observed individual and contextual variables, the analytic strategy used in this paper permits the estimation of the variation within PSUs and within districts (the two higher levels of aggregation) which remains after controlling for all the variables which were observed. This is particularly important for planners and programme managers as it enables one to identify what will potentially be the most effective strategies to improve the program.

Table 4 shows that for modern method use there remain extremely large variations in use, both between PSUs and between districts. The figures given in the table are approximately 95% confidence intervals for the variation between PSUs and districts respectively. Thus one would expect that in a district with a high contraceptive ethos the probability of a woman using a modern method would be 0.48 and in contrast, in a district with a low level of contraceptive use the probability would be 0.28. It should be noted (a) that this variation is over and above that explained by the individual and community level variables which have been controlled; and (b) these are rather extreme differences as the values presented will be the 2.5th and 97.5th percentiles. A further technical point is that for rows in Table 4 which reflect the unobserved variation the estimated probabilities do not add up to 1.00. This is because the confidence intervals for each method have been calculated using the multilevel variance for the contrast of interest alone.

The interpretation of this unobserved variation is simple. The individual and community level variables used in this study, while important predictors of contraceptive use, do not explain fully the pathways which influence contraceptive uptake in Bangladesh. There are influences both at the village (or mohalla) level and at the district level which serve to enhance or hinder the possibility of a woman using contraception. These could be community norms and values, for example, the degree of religiosity (as discussed by Amin, Diamond and Steele, 1996) or could reflect supply which may be inappropriate in certain areas and truly excellent in others. It is not possible in this paper to identify precisely these factors - which should be the subject of further research - but it is possible to identify the districts which perform particularly well or poorly, net of the observed characteristics. In each of these figures the districts are designated by a numeric code. These numeric codes are listed in Appendix A.

This can be undertaken by examination of Figures 1 to 3 which shows simultaneous 95% confidence intervals for the district level residuals for modern methods (Figure 1), sterilization (Figure 2) and traditional methods (Figure 3). If all the pathways through which socioeconomic and demographic characteristics influence contraceptive use (as well as the issues of supply) have been accounted for, then one would not expect to observe any inter-district variation and all the confidence intervals would overlap.

The confidence intervals in Figure 1 have been ranked by mean residual within division. One typically expects that many confidence intervals in figures of this type will overlap but Figure 1 shows that there remains variation within districts. A good research design for a future study would be to compare the factors influencing modern method use in the districts which are performing very well as opposed to those which have rather lower modern method use than one would expect. A district

which is performing well is one where the uptake is much higher than we would expect and a district which is performing poorly is one where uptake is much lower than we would expect. In the figures, districts performing well are to the right of each division's confidence intervals and those performing poorly are to the left.

It is notable that there is much less variation in Figure 3, which displays the confidence intervals for traditional use, than in Figures 1 and 2. This suggests that variations in quality of supply may indeed be some of the key unexplained pathways.

Summary

This chapter has demonstrated that, in the context of Bangladesh's extremely impressive family planning uptake, there remains variation in contraceptive use across social groups and, importantly, across geographical areas. Most of the variation is in modern reversible methods and, given the current focus of the family planning programme, this summary will concentrate on this type of method. It should be noted that, as observed elsewhere (see, for example, Steele and Diamond, 1996), the incidence of sterilization has greatly reduced in the 1990s and the relevance of an analysis of sterilization in these data is limited.

The results of the multilevel multinomial logistic regression analysis indicate that, although the programme has worked hard to cover all social groups, there remain significant groups of the population who are more socially and economically deprived and who have lower rates of modern method use. Examples include women with less education or those who have lower autonomy. Clearly, social programmes to raise the level of education of women and to improve women's autonomy will likely result in increases in modern use. However, they will only do so if the programme reaches all women in a culturally acceptable way. It is also extremely important to note that large increases in women's education and autonomy will be unlikely to have these dramatic impacts suggested by these analyses. This is because it is likely that currently educated women are likely to be a select group. Therefore, as more and more women become educated there will be increases in contraceptive use, but the effects will be relatively modest.

It is also crucial to maximize the effectiveness of supply. The data on contraceptive supply examined in this study suggest that while a fieldworker visits the great majority of communities, there remains a fair amount of variation in contraceptive use across communities which could partly be ascribed to problems in supply. For example, those communities which are relatively far from the thana or district headquarters have markedly lower probabilities of modern method use and a higher level of unexplained community and district level variation, to reflect a lack of or inappropriate supply in some areas. There remains a great need for programme managers to ensure that quality contraceptive advice reaches women in all social and geographical groups.

The unobserved community and district level variation could also reflect social and cultural norms which are either acting as conduits for successful delivery or as barriers to such delivery. For example, Amin, Diamond and Steele (1996) describe how community level religiosity may affect the supply of family planning and Steele, Diamond and Amin (1996) give some examples of how extremely enthusiastic local leaders such as school teachers can have a highly positive impact on the

uptake of child immunization in rural communities. It is essential that further research is undertaken to identify such factors and this chapter has identified the geographical areas in which this research should be concentrated.

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Figure 1: Simultaneous 95% Confidence Intervals for the residuals for the District effect for Modern Methods

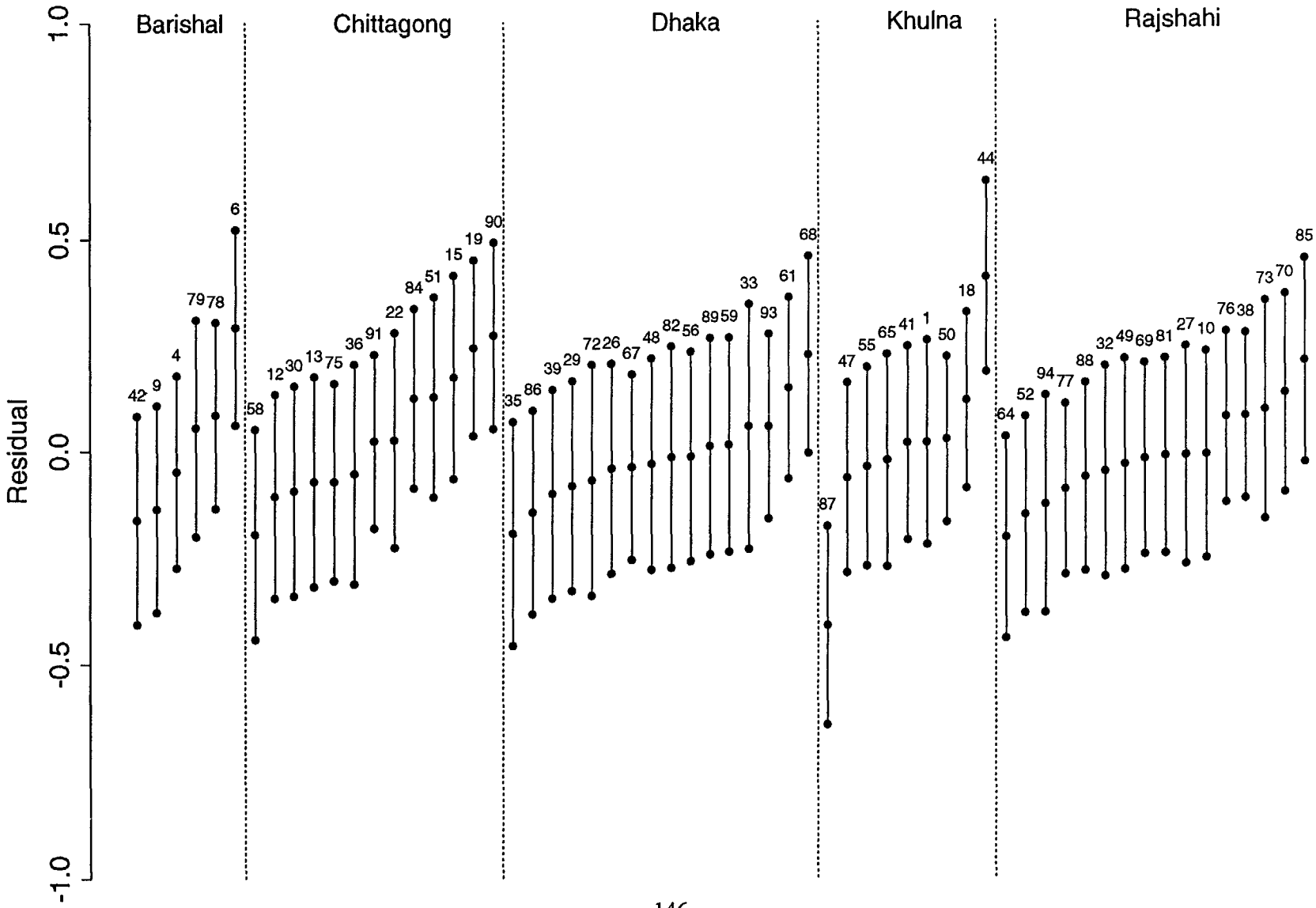

Figure 2: As 1 but Sterilisation

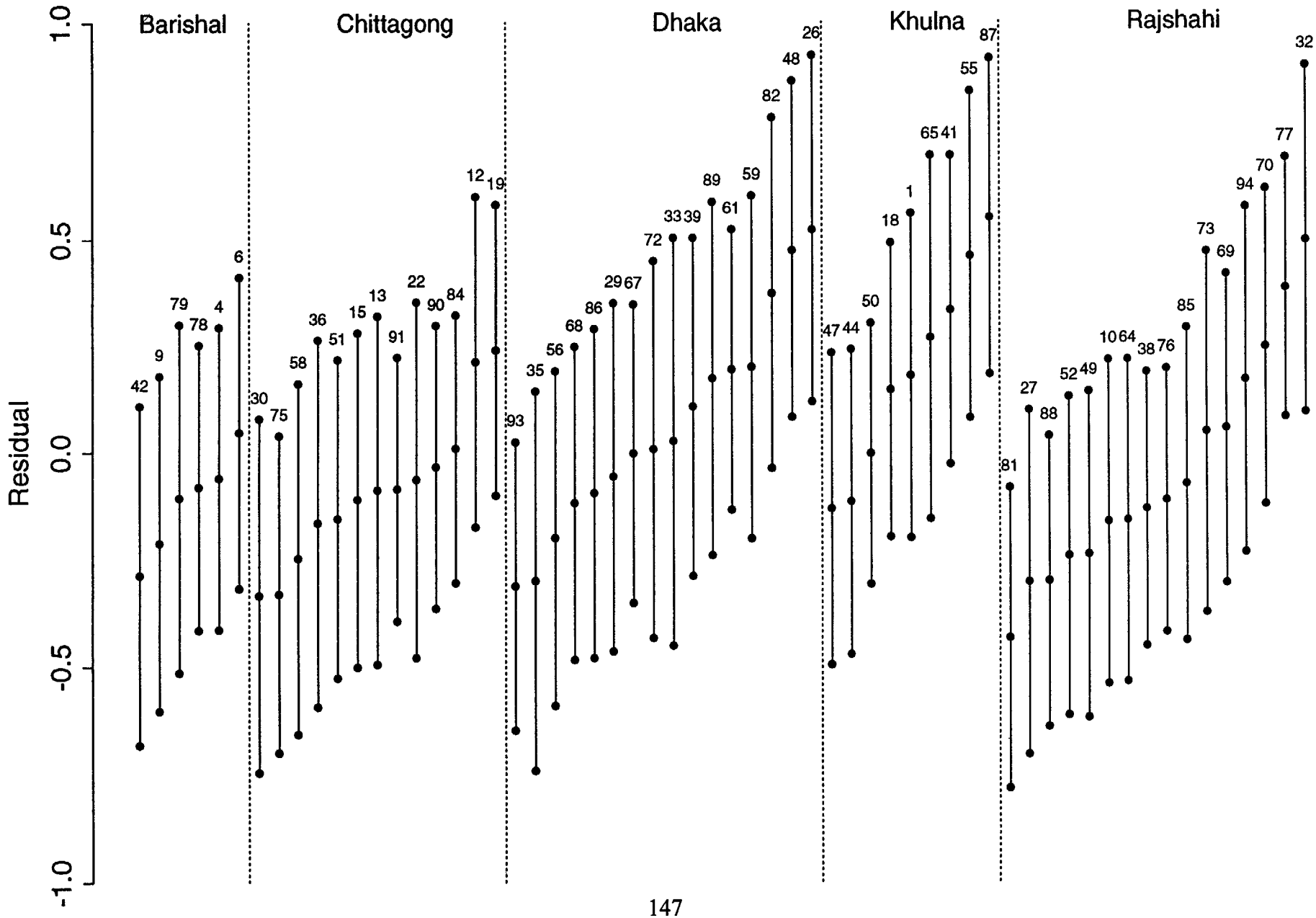

Figure 3: As 1 but Traditional

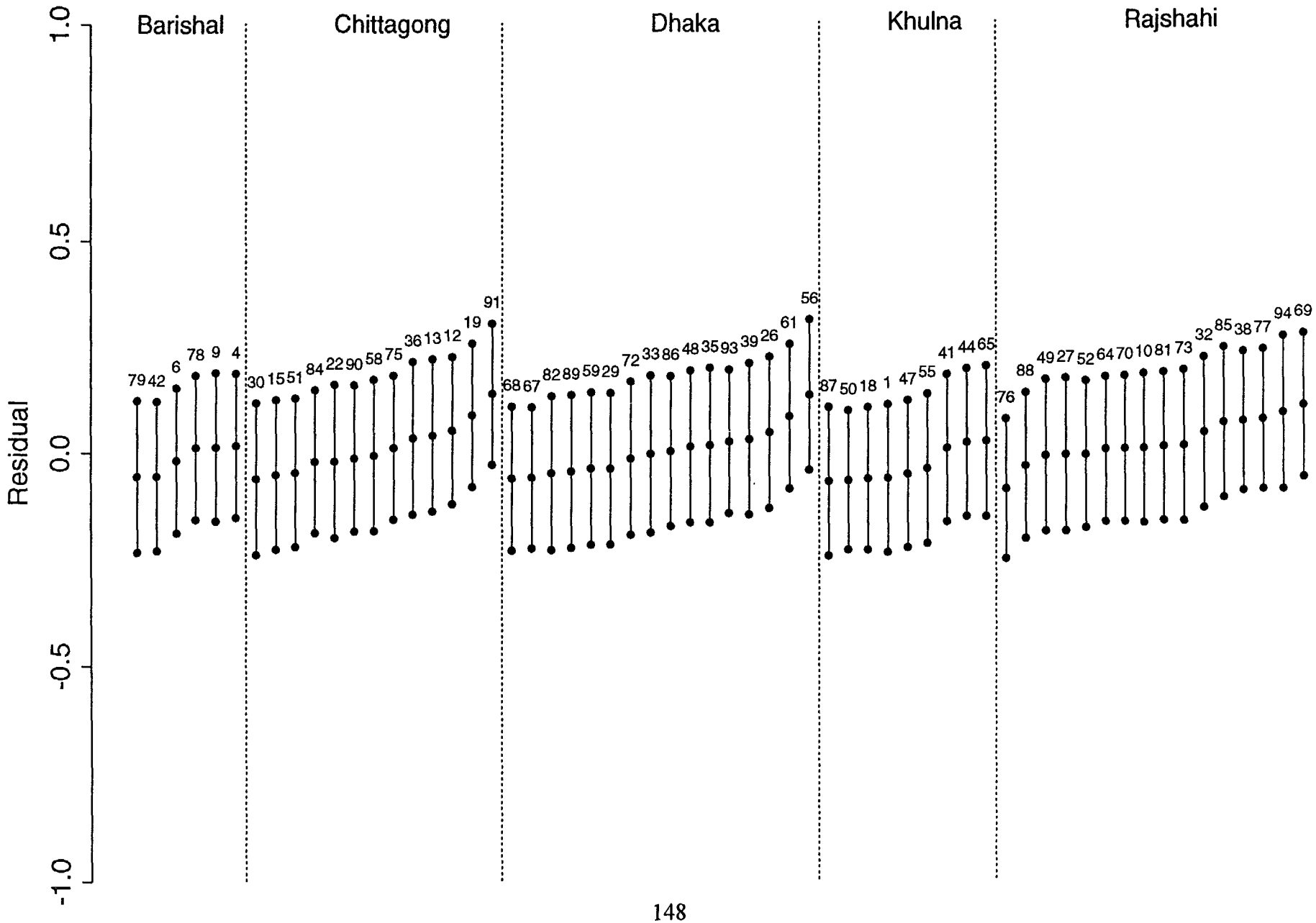

Table 1: Current Use of Family Planning by Age and Division of Residence

	Any method	Modern Method							Traditional Method				Not currently using	Total	Number of women
		Any modern method	Pill	IUD	Injec-tion	Condom	Female Sterilization	Male Sterilization	Any traditional method	Periodic abstinence	With-drawal	Other			
Age															
10-14	22.1	10.5	7.2	-	1.1	2.1	-	-	11.6	6.5	5.2	-	77.9	100.0	140
15-19	24.7	19.6	12.4	1.8	2.3	2.9	0.1	0.2	5.1	3.3	1.7	0.1	75.3	100.0	1224
20-24	37.6	32.0	19.7	2.2	4.2	3.5	2.0	0.4	5.6	3.6	1.4	0.6	62.4	100.0	1964
25-29	50.6	43.5	23.5	3.0	6.0	3.6	6.6	0.9	7.1	3.8	2.6	0.7	49.4	100.0	1911
30-34	57.2	46.1	20.3	2.7	6.0	2.6	12.4	2.2	11.1	5.9	3.2	2.0	42.8	100.0	1353
35-39	58.5	46.7	15.7	2.2	5.7	3.3	18.4	1.4	11.8	6.2	3.7	1.9	41.5	100.0	1079
40-44	51.9	38.2	12.1	1.6	3.7	2.1	16.6	2.0	13.7	9.1	3.2	1.4	48.1	100.0	767
45-49	29.3	21.3	4.7	0.1	1.2	12.0	12.0	2.1	8.0	4.5	1.2	2.3	70.7	100.0	541
Division															
Barisal	47.7	37.8	18.2	2.4	4.7	2.8	8.2	1.4	10.0	5.1	3.0	1.8	52.3	100.0	567
Chittagong	29.3	23.4	9.1	2.0	4.4	2.1	5.5	0.3	5.9	3.3	1.6	1.0	70.7	100.0	2334
Dhaka	44.3	36.3	18.2	1.9	4.4	3.0	8.2	0.7	8.0	4.6	2.4	1.0	55.7	100.0	2756
Khulna	55.3	42.8	20.1	3.1	5.4	4.4	8.5	1.3	12.5	7.1	4.3	1.0	44.7	100.0	1146
Rajshahi	54.8	45.9	23.5	2.1	4.2	3.3	10.4	2.3	8.9	5.5	2.3	1.1	45.2	100.0	2178
Total	44.6	36.2	17.4	2.2	4.5	8.1	8.1	1.1	8.4	4.8	2.5	1.1	55.4	100.0	8980

Table 2: Percentage[1] Distribution of Individual and Community Variables Included in Analysis

Variables	Percentage
Response:	
Current use of contraception	
Modern	30.8
Sterilization	10.1
Traditional	9.2
None	50.0
Division	
Barisal	10.6
Chittagong	19.7
Dhaka	28.3
Khulna	13.6
Rajshahi	27.9
Age	
<24	35.2
25-29	20.9
30-39	28.2
40-49	15.7
Children	
None	11.0
One boy	9.0
One girl	8.3
Two boys	5.9
Two girls	4.1
One boy and one girl	10.8
Three or more	50.8
Woman's education	
None	55.5
Incomplete primary	18.5
Complete primary	10.0
Secondary+	16.1
Residence	
Rural	85.3
Urban	14.7
Wanted last child (born within 3 years)	
No child in 3 years	52.6
Wanted then	33.7
Wanted later	8.0
Wanted no more	5.7
Allowed to go out	
Yes, alone	40.4
Yes, accompanied	40.9
No	18.7
Woman works for cash	
No	86.3
Yes	13.7

Table 2: (Continued)

Variables	Percentage
Religion	
Islam	87.7
Hindu	12.3
Distance to thana headquarters	(km)
Minimum	0.0
Mean (Standard deviation)	5.3 (4.4)
Maximum	21.0
Distance to district headquarters	(km)
Minimum	0.0
Mean (Standard deviation)	15.9 (11.1)
Maximum	52.0
Family planning worker visits village and provides information and methods	
Yes	96.3
No	3.7
Proportion of women in the district with any education	
Minimum	0.0
Mean (Standard deviation)	0.45 (0.13)
Maximum	0.84

Note 1: All the percentages are based on 8010 women in 295 primary sampling units in 60 districts.

Table 3: Parameter Estimates and Standard Errors for Multilevel Multinomial Logistic Regression[1] to Predict Method Use

Variable	Modern/None		Sterilization/None		Traditional/None	
	Estimate	Std. Err.	Estimate	Std. Err.	Estimate	Std. Err.
Constant	-2.340	0.397	-3.369	0.601	-3.206	0.413
Division						
Barisal	0	-	0	-	0	-
Chittagong	-0.537	0.203	-0.987	0.316	-0.498	0.213
Dhaka	0.140	0.193	-0.290	0.300	0.060	0.200
Khulna	0.532	0.189	-0.193	0.290	0.593	0.187
Rajshahi	0.670	0.197	0.199	0.302	0.489	0.203
Age						
<24	0	-	0	-	0	-
25-29	-0.068	0.079	0.728	0.177	0.016	0.135
30-39	-0.564	0.089	0.568	0.178	0.175	0.140
40-49	-2.001	0.122	-0.487	0.195	-0.488	0.171
Children						
None	0	-	0	-	0	-
One boy	1.921	0.150	2.139	0.363	0.746	0.215
One girl	1.827	0.153	1.790	0.397	0.498	0.232
Two boys	2.605	0.164	3.449	0.343	1.277	0.237
Two girls	1.984	0.180	2.081	0.425	0.917	0.261
One boy and one girl	2.639	0.148	3.329	0.328	1.329	0.204
Three or more	2.954	0.145	3.639	0.320	1.707	0.192
Woman's education						
None	0	-	0	-	0	-
Incomplete primary	0.315	0.070	-0.381	0.105	0.334	0.109
Complete primary	0.463	0.088	-0.842	0.163	0.688	0.125
Secondary+	0.935	0.076	-0.672	0.151	1.052	0.112
Residence						
Rural	0	-	0	-	0	-
Urban	0.092	0.105	-0.081	0.162	-0.238	0.141
Wanted last child						
No child in 3 years	0	-	0	-	0	-
Wanted then	-0.664	0.070	-2.796	0.162	-0.676	0.110
Wanted later	-0.567	0.102	-2.704	0.288	-0.456	0.160
Wanted no more	-0.132	0.112	-2.734	0.303	-0.371	0.168
Allowed to go out						
Yes, alone	0	-	0	-	0	-
Yes, accompanied	-0.195	0.058	-0.503	0.085	-0.129	0.087
No	-0.338	0.078	-0.721	0.132	-0.298	0.120
Woman works for cash						
No	0	-	0	-	0	-
Yes	0.097	0.076	0.554	0.096	0.171	0.114

Table 3: (Continued)

Variable	Modern/None		Sterilization/None		Traditional/None	
	Estimate	Std. Err.	Estimate	Std. Err.	Estimate	Std. Err.
Religion						
Islam	0	-	0	-	0	-
Hindu	0.213	0.082	0.641	0.109	0.567	0.107
Distance to thana headquarters (km)	-0.022	0.009	0.019	0.012	0.002	0.011
Distance to district headquarters (km)	-0.004	0.003	0.002	0.005	-0.009	0.004
Family planning worker visits						
Yes	0	-	0	-	0	-
No	-0.386	0.192	-1.348	0.386*	-0.182	0.246
Proportion of women in the district with any education	0.746	0.416	0.264	0.645	0.688	0.450
Primary sampling unit level random effect	0.090	0.024	0.164	0.050	0.037	0.039
District level random effect	0.044	0.019	0.123	0.047	0.017	0.021

Note 1: The model fitted is described fully in section 3 of the text.

Table 4: Estimated Percentage Probabilities[1] of Using Different Methods of Contraception

Variable	Method of Contraception			
	Modern	Sterilization	Traditional	None
Overall	37.9	4.5	8.6	49.0
Division				
Barisal	33.4	6.2	8.1	52.3
Chittagong	24.7	2.9	6.2	66.2
Dhaka	37.0	4.5	8.2	50.3
Khulna	44.1	4.0	11.3	40.6
Rajshahi	47.2	5.5	9.5	37.8
Age				
<24	50.1	2.9	7.2	39.8
25-29	46.9	6.0	7.3	39.8
30-39	34.8	6.3	10.5	48.4
40-49	12.9	3.4	8.4	75.3
Children				
None	6.6	0.5	4.6	88.3
One boy	30.5	2.8	6.5	60.2
One girl	29.2	2.1	5.4	63.3
Two boys	42.5	7.2	7.8	42.5
Two girls	31.5	2.5	7.5	58.5
One boy and one girl	43.5	6.3	8.2	42.0
Three or more	48.8	7.1	9.8	34.3
Woman's education				
None	32.4	6.5	7.1	54.0
Incomplete primary	39.4	4.0	8.8	47.8
Complete primary	42.1	2.3	11.5	44.1
Secondary+	51.6	2.1	12.6	33.7
Residence				
Rural	37.4	4.6	9.0	49.0
Urban	40.5	4.2	7.0	48.3
Wanted last child				
No child in 3 years	39.3	13.3	9.0	38.4
Wanted then	31.6	1.3	7.2	59.9
Wanted later	33.1	1.3	8.5	57.1
Wanted no more	43.0	1.1	7.8	48.1
Allowed to go out				
Yes, alone	40.2	5.9	8.9	45.0
Yes, accompanied	37.0	4.0	8.7	50.3
No	34.5	3.4	7.9	54.2
Woman works for cash				
No	37.8	4.2	8.5	49.5
Yes	38.3	6.8	9.3	45.6

Table 4: (Continued)

Variable	Method of Contraception			
	Modern	Sterilization	Traditional	None
Religion				
Islam	37.6	4.3	8.2	49.9
Hindu	39.1	6.8	12.2	41.9
Distance to thana headquarters (km)				
0	40.8	3.9	8.2	47.1
21	29.7	6.8	9.8	53.7
Distance to district headquarters (km)				
0	38.9	4.2	9.6	47.3
52	35.6	5.3	6.7	52.4
Family planning worker visits				
Yes	38.1	4.7	8.6	48.6
No	31.3	1.5	8.7	58.5
Proportion of women in the district with any education				
0	31.4	4.7	7.4	56.5
0.84	43.8	4.3	9.8	42.1
Primary sampling unit level random effect				
Lower 95% bound	25.3	2.1	6.1	-
Upper 95% bound	52.4	9.5	12.1	-
District level random effect				
Lower 95% bound	28.8	2.3	6.8	-
Upper 95% bound	48.0	8.6	10.9	-

Note 1: The estimated percentages are calculated from the model displayed in Table 3. In each of these probabilities, the estimate is calculated for a particular characteristic while holding the value of each of the other variables at their average value.

Appendix A

Codes for Divisions and Districts

Division	Code	District	Code
Barisal	1	1. Barguna	04
		2. Jhalkathi	42
		3. Barisal	06
		4. Bhola	09
		5. Patuakhali	78
		6. Pirojpur	79
Chittagong	2	1. Chittagong	15
		2. Sunamganj	90
		3. Maulvibazar	58
		4. Comilla	19
		5. Chandpur	13
		6. Laksmipur	51
		7. Feni	30
		8. Rangamati	84
		9. Sylhet	91
		10. Habiganj	36
		11. Brahmanbaria	12
		12. Noakhali	75
		13. Cox's Bazar	22
		14. Khagrachari	46
Dhaka	3	1. Dhaka	26
		2. Narayanganj	67
		3. Gazipur	33
		4. Faridpur	29
		5. Rajbari	82
		6. Narsinghdi	68
		7. Tangail	93
		8. Jamalpur	39
		9. Mymensingh	61
		10. Kishorganj	48
		11. Netrokona	72
		12. Gopalganj	35
		13. Madaripur	54
		14. Shariatpur	86
		15. Manikganj	56
		16. Munshiganj	59
		17. Sherpur	89
Khulna	4	1. Khulna	47
		2. Kushtia	50
		3. Chuadanga	18
		4. Jhenaidah	44
		5. Narail	65
		6. Jessore	41
		7. Bagerhat	01
		8. Magura	55
		9. Satkhira	87

Division	Code	District	Code
Rajshahi	5	1. Rajshahi	81
		2. Dinajpur	27
		3. Nilphamari	73
		4. Rangpur	85
		5. Bogra	10
		6. Noagaon	64
		7. Nawabganj	70
		8. Serajganj	88
		9. Pabna	76
		10. Panchagarh	77
		11. Thakurgaon	94
		12. Lalmonirhat	52
		13. Kurigram	49
		14. Gaibandha	32
		15. Joypurhat	38
		16. Natore	69

The Immunization Program: An Impressive Achievement, But Challenges Remain

Kanta Jamil, Abbas Bhuiya, Kim Streatfield, Nitai Chakraborty

Introduction

Tremendous progress has been made over the past 20 years toward development of effective national immunization programs throughout the world. The major contributor to this success is the Expanded Program on Immunization (EPI) of the World Health Organization (WHO), usually implemented through UNICEF. The EPI was created in 1974 as a worldwide alliance of collaborating nations whose goal was to expand immunization services and coverage. The program consists of vaccination against six childhood diseases: polio, measles, pertussis, tetanus, diphtheria and tuberculosis. Top priority was given to the developing countries because of the seriousness of these diseases and the problem of immunization service delivery was more severe in these areas.

Bangladesh officially initiated EPI in 1979. However, EPI efforts were seriously considered in this country only after 1985 when Bangladesh made its commitment at the United Nations to reach universal child immunization by 1990. The program received strong support and assistance from multiple partners, including non-governmental organizations, donor agencies, commercial enterprises and community volunteers.

During the mid 1980s major steps were taken by the program in many areas, with particular emphasis on establishment and improvement of the infrastructure for immunization like procurement of improved cold chain equipment, vaccination tools and portable vaccination kits, training of immunization teams, development of strategies for effective immunization delivery and subsequently promotion of demand for immunization through various communication media and health education campaigns. The intensified immunization program was expanded in phases. In 1985 the first phase of EPI commenced in 8 thana; it expanded to 190 thanas in 1988 and near universal access to immunization service was achieved by end of 1989 (Talukder et al., 1991).

EPI in Bangladesh is implemented through various clinic-based and outreach activities. Immunization motivation and education are provided during household visits by health workers, known as Health Assistants (HA) and family planning fieldworkers called Family Welfare Assistants (FWA), while vaccination services are available at outreach centers like EPI sites and satellite clinics, and in static clinics. It is primarily the health workers who are responsible for the administration of the vaccinations at health centers. The family planning fieldworkers (FWAs) also assist in the administration of vaccinations at outreach sites (EPI spots and satellite clinics), although this is not considered as their primary responsibility (Talukder et al., 1991)

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The achievement of the immunization program in Bangladesh has been impressive. In ten years TT immunization acceptance increased more than 10 fold from 6 percent in 1984 to 67 percent in 1993-94, and full immunization among children 12-23 months old increased from a negligible proportion to almost 60 percent[1] (Huq and Cleland, 1990; Mitra et al., 1994).

In spite of the successes some challenges still remain for the program. First, acceptance of TT immunization has increased but the level still remains less than satisfactory. The proportion of children who received at least one of the recommended vaccinations has increased to 85 percent, but full immunization coverage is still at a level where improvement is required. Second, there is large variation in immunization coverage among regions and socio-economic groups where a more equitable coverage is desired.

The objectives of this paper are (1) to review the achievements of the program and identify areas where performance needs improvement, and (2) to identify socio-demographic, economic and health program factors that are associated with acceptance of immunization. The intent of the analysis is to identify areas where health program could be effective.

Methods

Data

The study used data from the Bangladesh Demographic and Health Survey 1993-94, that collected its information during the period November 1993 through March 1994. Information on immunization was gathered from mothers about all births that occurred in the four years preceding the survey, and if the child born was alive at the time of the survey. Out of 9640 respondents, 4342 women reported having at least one birth in the 4 years preceding the survey[2]. A total of 5171 births were reported out of which 4468 were in the rural areas and the rest in the urban areas.

In the 1993/94 BDHS the question asked on TT immunization was: "when you were pregnant with (name of the child) were you given an injection in the arm to prevent the baby from getting tetanus, that is convulsions after birth?" The doses of TT received were also recorded. For all these births BDHS also collected information on whether any of these births had antenatal checks during pregnancy.

For child immunization, if respondents were able to show vaccination cards of the child, the information from the card was recorded. In households with no vaccination cards, the mother was

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1. BDHS data shows considerably lower level of full immunization coverage of children, compared to the 1993 EPI Coverage Evaluation Survey. The latter estimated that three in four children 12-23 months old received full immunization coverage, while the BDHS report that three in five children of the same group were fully immunized.

2. Among them, 3643 women had exactly one birth, 770 had 2 births, 28 had 3 births and one had 4 births.

asked whether the child received each of the following vaccinations: BCG, DPT (and the doses), Polio (and the doses) and Measles.

Method of Analysis

The analysis consists of three parts: First the paper reviews national trends in TT immunization over the last ten years using data from the Bangladesh Fertility Survey 1989 and BDHS 1993-94. Second, to identify low performing areas, the paper examines through bivariate analysis, differentials in antenatal care (TT immunization and antenatal checks) and child immunization by place of residence and region. Finally, it examines differentials in TT immunization during pregnancy and full immunization coverage of children 12-23 months of age in rural Bangladesh by a variety of socio-economic characteristics and health program inputs. Multivariate analysis, namely logistic regression was used to identify factors that are significantly associated with differentials in TT immunization among pregnant mothers and full immunization among children in rural Bangladesh. To examine whether programmatic factors affect immunization acceptance differentially by socioeconomic groups or regions, the multivariate model included both the net and interaction effects of the independent variables. The effects of the programmatic variables were examined by adding products of programmatic variables and socioeconomic and demographic variables to the model with the main effects. The predicted proportions of pregnancies/children immunized were calculated in each of the categories of programmatic and socioeconomic variables with statistically significant interaction terms.

Results

Before discussing the results, it will be helpful to clarify what are the outcome measures for TT immunization and full immunization of children in this study.

This paper examined whether a birth received at least one shot of TT vaccination during pregnancy. This does not necessarily imply that the pregnancy was protected against maternal and neonatal tetanus, since the first dose of TT vaccination in a woman's lifetime does not offer her much protection (WHO 1988). While five doses of TT shots offer lifetime protection against tetanus, the years of protection that 2nd, 3rd and 4th doses offer vary -- the duration increase with the number of doses taken. In the BDHS, since information on TT immunization was collected only for those births occurring within four years preceding the survey, it is not possible to ascertain whether the pregnancy required any TT shot for protection against tetanus or whether one TT shot was sufficient to offer protection, without additional information on women's TT vaccination status for all births (except for the woman who had all her births in the four years preceding the survey).

In Bangladesh, it is extremely difficult to determine which pregnancies actually require TT vaccinations, since most women do not retain TT vaccination cards and maternal recollection of vaccination becomes less accurate over time (De Silva et al., 1991; Francisco and Chakraborty, 1996). The practical implementation of the Expanded Programme on Immunization in Bangladesh and that suggested by WHO for developing countries is: the first pregnancy contacted (or the first contact) for TT vaccination should receive two doses at least 4 weeks apart. All subsequent pregnancies receive one shot of TT up to five doses of TT during a woman's' lifetime. The outcome variable examined

in this study is the acceptance of at least one dose of TT immunization during pregnancy rather than an examination of whether the pregnancy was fully protected by it or not.

In this paper a child 12-23 months old is considered fully immunized if she/he had received all of the following vaccinations -- BCG, DPT1, DPT2, DPT3, Polio1, Polio2, Polio3 and Measles at the time of the survey.

Trends in TT Immunization

Acceptance of Tetanus Toxoid immunization increased ten times in the last 10 years from 6 percent in 1984 to 67 percent in 1993-94 (figure 1). The highest increase occurred between 1988 and 1990, and this corresponded to the period of phased expansion of the Immunization Program from 190 thanas (out of 464) to nationwide. However, the proportion receiving TT vaccination changed very little after 1991.

Table 1 reveals differentials in trend of TT immunization by region of residence and other socio-economic characteristics of the mother. The success of TT immunization is more prominent in Khulna[3] and Rajshahi than in Chittagong and Dhaka divisions. In the five years preceding the survey, the former two divisions recorded the largest increase, which widened the disparity in levels of TT immunization among the four divisions.

In 1988-89, the percent of pregnancies receiving TT immunization was twice as high in the urban areas (53 percent) than in the rural areas (24 percent) of Bangladesh. In the rural areas, TT immunization acceptance increased 2.7 times in the next five years compared to 1.5 times in the urban areas, thus narrowing the gap between the urban and rural areas. Yet in 1993-94, four out of five (81 percent) pregnancies received TT shots in the urban areas compared to only two in three pregnancies (65 percent) being vaccinated in the rural areas.

Table 1 also shows that the largest increase in TT vaccination has occurred among the relatively disadvantaged groups, for example among mothers with no education and among the relatively poorer economic groups[4]. Although the percent receiving TT vaccination is still considerably higher among the more educated and economically better-offs, it is encouraging to see that the gaps in TT vaccination have narrowed over the years among women of different education and economic groups. First birth order pregnancies always had a higher probability of receiving TT immunization compared

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3. The administrative divisions of Barishal and Khulna are considered together in Khulna Division to avoid limitations of small sample size.

4. The respondents were asked whether her household owned any of the following articles: bed, table, almirah, watch, radio or television. In this study ownership of these articles were assumed to indicate economic status of the respondents household-- the more articles the household has the better the economic status. Three categories were considered: those who owned at most 1, 2-3 and 4-6 articles.

to higher order births; and here also the narrowing of the difference in TT immunization over the years for different birth orders was observed.

Antenatal Care and Immunization: The Low Performing Areas

Although acceptance of TT immunization as a part of antenatal care had substantial success, other aspects of antenatal care like antenatal checks during pregnancy remained less than satisfactory, particularly in the rural areas of Bangladesh (Table 2a). Only one in five births in rural areas received both TT vaccination and any antenatal check during pregnancy. Comparatively in the urban areas antenatal checks were more common; one out of two births received both TT vaccinations and antenatal checks.

In both rural and urban areas, variations in antenatal care among divisions also exist. In the rural areas, Rajshahi and Khulna had the most success in terms of TT vaccination (71 percent). On the other hand, Rajshahi reported the lowest level of antenatal checks (18 percent). The performance of rural Chittagong was poor both in TT immunization and antenatal checks; among the four divisions, levels of TT immunization were lowest in Chittagong (54 percent) and the percentage of births receiving at least one antenatal check was only 20 percent. Thus in rural Chittagong and Rajshahi, only one in five births received both TT immunization and antenatal check, compared to one in four births in Khulna and Dhaka.

In the urban areas, Dhaka scored the highest in terms of the percent of births that received both TT immunization and antenatal checks (55 percent). Urban Chittagong fared better than either urban Khulna or Rajshahi in percent of births that received both TT immunization and antenatal checks.

In rural Bangladesh significant differences in child immunization coverage by divisions are observed (Table 2b). In Khulna three out of four children of age 12-23 months were fully immunized, while in Chittagong and Dhaka only one out of two children were fully immunized. Rajshahi Divisions' performance was lagging behind Khulna but was better than Chittagong and Dhaka.

In the urban areas, full immunization coverage among children was highest in Rajshahi (79 percent) and lowest in Dhaka (63 percent), but the sample size is too small to make these variations very meaningful.

Immunization Differentials in Rural Bangladesh

Since levels of TT immunization and full immunization of children were considerably lower in the rural areas of the country compared to the urban areas, this paper undertook a more detailed investigation of the differentials for the rural areas only. The purpose was to examine the relative influence of various socio-demographic, economic factors, and program inputs on the probability of immunization. The study also explored whether the health program inputs affected various groups differently.

TT Immunization: Logistic Regression Results

Results of the multivariate analysis of the relationship between acceptance of TT immunization and health program factors and other variables are shown in Table 3, Figures 2 and 3. For this analysis the results are best expressed through odds ratios for the main effects and through estimated proportions of births immunized for the statistically significant interaction terms.

Socio-Demographic and Economic Factors

Younger and more educated mothers were more likely to receive TT shots during pregnancy. The probability of being immunized during pregnancy is significantly different (40 percent lower) for women who were 30 years or older compared to those under 20 years of age. Mothers who had completed primary level of education had 1.8 times higher chance of being immunized during pregnancy compared to mothers who had no schooling. There was no significant difference in immunization acceptance between mothers with no education and those who had schooling below primary level.

Mothers whose physical mobility was limited had 30 percent lower chance of being immunized compared to mothers who could go to health centers without being accompanied by other adults. The difference was statistically significant. Mothers who were members of any development organizations (like BRAC, Grameen, etc), had significantly higher likelihood of being immunized, probably reflecting the effects of exposure to formal and informal information on health improvement strategies.

Listening to radio had a significant positive association with acceptance of TT immunization. Those who did not own a radio but listened to radio at least once a week, had 40 percent higher chance of being immunized compared to those who did not listen to radio as frequently. This is an interesting finding since it points out that access to radio even at the community level could have the desired effects without personally owning a radio. Those who had a radio were also more likely to be immunized compared to those who did not own or listened to radio. However, the latter difference probably captured combined effects of better economic conditions and media exposure and not pure media exposure effect. One of the reasons for the success of EPI in Bangladesh is the efforts that it undertook to create demand for immunization services through extensive program communication tools where media like radio, television, theaters, etc. were used to inform people of the benefits of immunization (Abed et al., 1991). The findings of this paper affirm the positive effects of a mass media approach on acceptance of immunization in rural Bangladesh.

Health Program Factors

Four measures of health program inputs were considered using data collected through BDHS; namely, whether the respondent's household was visited by a family planning fieldworker in the last six months; whether any health worker worked in respondent's village/community; proximity of outreach clinic sites; and distance to the nearest static clinic like Family Welfare Center, Thana Health Complex or a hospital. However, a limitation of the BDHS data for investigation of the influence of the health programs on immunization acceptance is that it did not collect information on the

accessibility of sampled areas/households to EPI outreach spots which is an important source for receiving vaccinations.

Accessibility to all the health facilities/workers included in the model positively influenced acceptance of immunization in rural Bangladesh. In villages where health workers were present, pregnant women were 50 percent more likely to receive TT shots compared to mothers who lived in villages that had no health workers. The difference was statistically significant. Proximity to outreach clinics had a significant positive association with acceptance of TT immunization. The chances of receiving TT vaccinations was 20 percent lower for those who lived in villages where satellite clinics were not held within two miles.

The effects of household visits by family planning fieldworkers and accessibility to static health centers depended on other factors and are discussed below.

Interaction Effects

The logistic regression analysis revealed that the effects of household visits by family planning fieldworker (FWA) and proximity to static health centers were dependent on birth order, economic status of the household and region of residence. For these statistically significant interaction effects the proportion receiving TT immunization for each categories of pairs of programmatic and socio-demographic and economic variables were calculated and are presented in Figures 2-5.

Household visits by FWA and birth order

Women who were visited by family planning fieldworkers at her household had a significantly higher chance of accepting TT immunization during pregnancy (Figure 2). However, fieldworker household visits were slightly more important in increasing the acceptance of TT immunization among first birth orders relative to higher birth orders. This probably reflects that mothers with no previous experience of births were more likely to be influenced by information and motivation provided by fieldworkers.

Household visits by FWA and households' economic status

The effects of family planning fieldworker household visits on TT immunization acceptance is much greater in economically disadvantaged households (Figure 3). Economic status of the household had a substantial positive effect on TT immunization, but this effect diminishes as fieldworker household visit increases. For example, among the relatively poorest households (who owned at most one of the specified articles mentioned in the BDHS), and those who received no FWA visits the percent immunized was 51 percent, while among the those who owned 2-3 articles and were not visited by fieldworkers the percent immunized was 64 percent. In both economic groups if fieldworker visited the household the proportion immunized rose to almost the same level (66 percent and 68 percent respectively). The effect of fieldworkers household visits on the relatively better off households (those who owned 4-6 articles specified in BDHS) was at most marginal. This indicates that motivation and information provided by family planning fieldworkers have substantial influence on acceptance of TT immunization in the more economically disadvantaged households.

Proximity to static health centers and economic status

Distance to static health centers had a more substantial effect on being immunized during pregnancy on the most economically disadvantaged group (Figure 4). TT immunization in the 'best-off' group of the BDHS rural sample (those who owned 4-6 articles) was not affected negatively if distance to health centers increased. While among the most disadvantaged economic group, having static health centers within two miles, increased the proportion receiving TT immunization from 45 percent to 62 percent.

Proximity to static health centers and region of residence

Figure 5 shows that distance to static health facilities is a more important factor in TT immunization acceptance in some regions than others. For example, in rural Dhaka and Chittagong those who lived in areas where health centers were available within two miles had at least 35 percent higher chance of receiving TT immunization in both the regions, than those who lived farther away. In Khulna, the effect was smaller, about 16 percent, and in Rajshahi accessibility to static health centers did not affect TT immunization. With improvement in accessibility regional differences in immunization still remain but become less prominent.

Full Immunization of Children: Logistic Regression Results

Results of the multivariate analysis of the relationship between full immunization of children and health program-related and other variables are shown in Table 3.

In the analysis of full immunization coverage the findings of the study indicate that socio-demographic and economic characteristics of individuals/households are more likely to affect the chance of a child being fully immunized than health program factors.

Socio-Demographic and Economic Factors

Mothers' education, sex of the child, region of residence, and economic status of the household are factors that were significantly associated with full immunization among children aged 12-23 months. Mothers who completed at least primary level of education were 1.7 times more likely to have their children fully immunized compared to those who had no education. However there was no significant difference in immunization coverage of children among mothers who had no schooling and who had lower than complete primary level of schooling. Compared to the most economically disadvantaged groups (owning at most one household article) children of the relatively better off households (those who owned 4-6 articles) had 80 percent higher chances of being fully immunized.

Sex discrimination exists in child immunization in the rural areas of Bangladesh. Female children had 30 percent less chance of being fully immunized compared to male children.

Variations in full immunization coverage among divisions were apparent and highly significant. Children in rural Dhaka and Chittagong were 60 percent and 70 percent respectively, less likely to be immunized than those residing in Khulna. Children in rural Rajshahi were also disadvantaged

compared to Khulna; in the former children were 40 percent less likely to be fully immunized compared to the latter. In rural Rajshahi acceptance of immunization (in terms of TT and partial immunization of children) was as high as in Khulna, however it lagged behind the latter in full immunization coverage among children. None of the other socio-demographic factors (namely, mothers' age, mobility, and affiliation to a development organization) or any interaction were found to be significantly associated with child immunization.

Health Program Factors

Among the four health program inputs included in the model, only proximity to satellite clinic was found to be significantly associated with full immunization of children. Children in areas where satellite clinics were not held within close proximity (distance of two miles) were 30 percent less likely to be immunized compared to those who lived in communities where satellite clinics were held or were within a distance of two miles.

Discussion

Bangladeshs' efforts in creation of demand and provision of services for immunization has had significant successes. It is encouraging to see that the improvement in immunization coverage has occurred in all socioeconomic groups, the increase over the years being higher for the relatively socioeconomically disadvantaged groups. What is important for other sectors to learn is how the efforts of EPI in Bangladesh accelerated immunization coverage and were capable of reaching across all socioeconomic groups within a short time.

In spite of the success some concerns remain. This study identifies some of the challenges of the immunization program and attempts to point out where the health program needs to focus to become more effective.

Major improvements in immunization coverage are needed in certain geographic areas. Rural Chittagong and Dhaka are the particular low performing areas that need more program attention. In mortality and contraceptive use also Chittagong and Dhaka Divisions display poor performance compared to Khulna and Rajshahi (Huq and Cleland 1990; Mitra et al., 1994).

The Fourth Population and Health Project of the Government of Bangladesh proposed that by 1996 antenatal care should cover 50-60 percent of all pregnant women. Although TT immunization as a part of antenatal care has fulfilled this objective, unfortunately other aspects of antenatal care remain at a poor level. One such example is the low proportion of pregnancies that receive any antenatal check-up. While one in two pregnancies receive both antenatal checks and TT immunization in the urban areas, in rural Bangladesh only one in five pregnancies receive both types of antenatal care. Improvement in proportion of births that receive antenatal check-ups is desired nationwide and could be brought about if missed opportunities can be utilized. For example women who come for TT immunization at various service points could be motivated and educated for antenatal check ups. Provision of these two services at the same service point (an example is by merging EPI and satellite clinics to be held in one spot and at the same time) could achieve success in increasing the proportion of pregnancies that receive antenatal check-up. This approach has been recently incorporated into the

program, and preliminary results from operations research conducted through the International Centre for Diarrhoeal Disease Research, Bangladesh indicate that this integrated approach positively influences antenatal check-ups.

In rural Bangladesh, health programs have significant positive influence on TT immunization; however the impacts of some health program are different for various socio-demographic and economic groups. Household visits by fieldworkers positively influence acceptance of TT immunization during pregnancy, pointing to the need for motivation, information and referral services provided by these workers in the rural areas of Bangladesh. However, the impact of these household visits are greater for mothers of economically disadvantaged households, and for first births. In fact household visits by fieldworkers hardly influence behavior regarding TT immunization for the economically better-offs. Unfortunately, fieldworker visitation patterns reveal that women who need health workers contact most (those from poor households) are less likely to be visited by the female fieldworkers. At a time in Bangladesh when discussion on the possibility of introducing selective household visitation by fieldworkers and focussing visits to 'needy' groups are raised (Government of Bangladesh, 1994; Government of Bangladesh, 1996 ; Janowitz et al., 1996) this study suggests that women from poor households are to be considered among the priority groups to be reached for improving TT immunization acceptance. This argument is reinforced by another finding of this study that for women of poor households proximity of static health centers has a significantly large influence on their decision to be immunized. Even when health services are provided free, the cost of accessing health care may not be negligible for the most poor households. Time and financial costs of getting to the health facilities get higher as distance to health centers from the respondents residence increases. This cost imposes a greater burden on the more economically disadvantaged groups, negatively affecting their health care seeking behavior. Outreach services should target women from poor households, particularly those who have less access to static health centers.

For the immunization program another group of concern is mothers who say they cannot go to health centers alone or with a child; these mothers have a significantly lower chance of being immunized during pregnancy compared to women whose physical mobility is not restricted. While for contraceptive use, the needs of many women with limited mobility may be served by providing pills and condoms at the doorstep, but a similar approach of service delivery may not be practical or effective for an immunization program (Talukder et al., 1991). The result emphasizes that in households where womans' mobility is restricted there is a greater need for educating other adult household members on the benefits of immunization so that the person in need of immunization can get support from other family members (for example accompanying the client to the service center) in seeking immunization services at outreach service points or at static clinics.

In rural Bangladesh, distance to static health centers negatively affects acceptance of TT immunization, and the impact is particularly high in Dhaka and Chittagong. However, in Rajshahi proximity of static health centers does not affect immunization acceptance among women. One plausible explanation of this finding is that in Rajshahi health program inputs and mass communication tools have had a greater impact in creating a much stronger demand for TT immunization than elsewhere and accessibility of health centers play a less significant role. An alternate interpretation is that outreach health sites function more efficiently in Rajshahi than in the other divisions, thus nullifying much of the need to seek services in the static health centers. If the

latter is the case then the suggestion is that low performing divisions must strengthen their outreach health program, so that women who live farther way from static clinic sites are not deprived of services.

In spite of almost universal access to immunization services, sex discrimination against female children exists in seeking full immunization coverage, in the rural areas of Bangladesh. The lack of significant interaction of the effects of sex of the child and education level and economic status of households imply that the extent of discrimination is similar across education and economic groups. Similar findings are reported in other studies (Amin, 1993; Bhuiyan et al., 1995). Unfortunately sex discrimination against female children was also found in other types of health care seeking behavior (Chen et al., 1981; Hossain and Glass, 1988; Bhuiyan and Streatfield, 1992). This is partly responsible for the result that in Bangladesh among children aged 1-4 years, 1.33 girls die for every boy. Sex discrimination against female children by families is a difficult problem to overcome completely by health service providers. However, possible suggestions to minimize this problem include more frequent contacts and greater motivational efforts by service providers in households that have female children who need to be vaccinated against childhood diseases.

Maternal education is positively related to the chance of a child being fully immunized. Similar findings were observed in other studies in Bangladesh and elsewhere (Streatfield et al., 1990; Amin et al., 1993; Bhuiya et al., 1995). Since in rural areas, the majority of mothers have no or very little schooling, a logical question is 'what kind of health interventions can improve the chance of children of illiterate mothers to be fully immunized?' A possible mechanism through which education influences child health care seeking behavior is that maternal education increases knowledge of ways to prevent childhood illness and enables better understanding of information on preventive care (e.g., see Cleland 1989, Chakrabarty and Streatfield, Streatfield et al., 1990).

To improve full immunization coverage one must first understand the reasons for incomplete immunization. In rural Bangladesh, while four out of five children are receiving at least one of the recommended vaccinations, only three in five are being fully immunized. Coverage is lowest for DPT3, Polio3 and Measles vaccinations. One likely reason for incomplete child immunization (in spite of high partial immunization) is that mothers lack understanding of information on full immunization, like timing of immunization, doses required, benefits of full immunization, etc. The few studies that have investigated the reasons for incomplete child immunization found this to be the case (Streatfield and Singarimbun, 1988; De Silva et al.,1991). Mothers' insufficient understanding of full immunization could be because messages are not communicated in a way that they understand. Experience in other developing countries shows that improving mothers knowledge of immunization has the potential to reduce the gap in coverage between children of well-educated and non-literate mothers (Behrman and Wolfe, 1987; Streatfield et al., 1990). This can be done by providing comprehensive and appropriate information through special campaigns, mass media approaches, and health service providers.

The global immunization initiative starts with an attack against six vaccine preventable diseases of childhood, but its ultimate goal is that it would serve as a catalyst in the development of primary health care delivery capability in the developing world (Foege, 1984). Where does EPI in Bangladesh stand within this global perspective? EPI in Bangladesh has reached maturity, and even though some

challenges still remain, the program has moved in a direction that is consistent with the perspective of the global immunization initiative. Provision of immunization, selective maternal and child health care and family planning through combined EPI and satellite clinic spots marks the first step toward offering integrated services. Other pilot projects have been undertaken in Bangladesh where EPI has been expanded to incorporate other primary health care services. While the impact of these efforts must be carefully tried and evaluated, there is little doubt that the EPI program has made impressive strides toward achieving its comprehensive objectives.

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Table 1 : Differentials & Trends in TT Immunization in Bangladesh 1984-1994.

Percent of Births receiving TT Immunization during Pregnancy.

	Year of Birth		
	1984[1]	1988/89[1]	1993/94[2]
NATIONAL	**6**	**26**	**67**
Region			
Khulna[3]	4	25	72
Chittagong	5	23	60
Dhaka	8	26	66
Rajshahi	5	25	71
Place of Residence			
Rural	5	24	65
Urban	21	53	81
Mothers' Education			
None	3	19	59
Primary incomplete	8	25	67
Primary complete	16	42	83
Birth order			
1	8	35	79
2	6	24	72
3+	5	20	59
Economic status [4]			
Owns 0-1 articles	3	18	57
Owns 2-3 articles	6	22	68
Owns 4-6 articles	15	47	83

1 Source: Bangladesh Fertility Survey 1989.

2 Source: Bangladesh Demographic and Health Survey 1993-1994.

3 Khulna represents Khulna and Barisal Divisions.

4 The definition is not strictly comparable for the BFS 1989 and BDHS 1993-94, since information collected on ownership of household articles were not the same in both the surveys.

Table 2a: Antenatal Care: Antenatal Checks and TT Immunization

Percent of Births in 1990-1993/94 receiving TT Immunization and Antenatal Checks during Pregnancy by Place of Residence.

	Place of Residence				
	Rural				
	Khulna	Chittagong	Dhaka	Rajshahi	**All**
N	(1004)	(1093)	(1250)	(1094)	(4441)
TT Immunization[1]	71	54	61	71	**64**
Antenatal Check[1]	25	20	26	18	**22**
TT & Antenatal Check[1]	23	18	23	16	**20**
None[1]	26	44	37	27	**34**
	Urban				
N	(118)	(152)	(256)	(173)	(699)
TT Immunization[4]	80	78	82	73	**78**
Antenatal Check[2]	42	49	59	46	**51**
TT & Antenatal Check[3]	41	47	55	43	**48**
None[3]	19	19	14	25	**10**

1 Difference among Divisions significant at P<.001.
2 Difference among Divisions significant at P<.01
3 Difference among Divisions significant at P<.05
4 Difference among Divisions not significant.

Table 2b: Full Immunization among Children Age 12-23 Months

Percent of Children Fully Immunized by Place of Residence.

Place of Residence	Khulna	Chittagong	Dhaka	Rajshahi	**All**
			Rural		
N	(233)	(265)	(267)	(224)	(989)
Full Immunization[1]	77	52	46	63	59
			Urban		
N	(27)	(38)	(56)	(34)	(155)
Full Immunization[2]	74	71	63	79	71

1 Difference among Divisions significant at P<.001.

2 Difference among Divisions not significant.

Table 3

Logistic Regression Analysis of TT Immunization during Pregnancy and Full Immunization of Children Age 12-23 Months.

	TT Immunization during Pregnancy		Full Immunization of Children	
	Odds Ratio	N	Odds Ratio	N
Mothers' Age				
<20 (ref.)	1.0	1181	1.0	249
20-29	0.8	2421	1.2	558
30+	0.6***	743	1.4	155
Mothers' Education				
None (ref.)	1.0	2542	1.0	564
Primary incomplete	1.1	795	1.1	168
Primary complete	1.8***	1008	1.7*	230
Birth Order				
1 (ref.)	see figure 2 for	1064	1.0	224
2+	interaction effect	3281	0.9	738
Mothers' Mobility				
Can go to Health Clinic (ref.)	1.0	3286	1.0	750
Cannot go to Health Clinic	0.7***	758	0.9	156
Other	0.7*	301	1.1	56
Mothers' Affiliation with Development Organization				
Non member (ref.)	1.0	864	1.0	178
Member	1.3***	3481	1.3	784
Sex of the Child				
Male (ref.)	NA		1.0	485
Female			0.7*	477

***P<.001 **P<.01 *P<.05
ref. = reference category

Table 3(continued)

Logistic Regression Analysis of TT Immunization during Pregnancy and Full Immunization of Children Age 12-23 Months.

	TT Immunization during Pregnancy		Full Immunization of Children	
	Odds Ratio	N	Odds Ratio	N
Region				
Khulna (ref.)	see figure 5 for	985	1.0	229
Chittagong	interaction effect	1068	0.4***	258
Dhaka		1224	0.3***	259
Rajshahi		1068	0.6*	216
Economic Status				
Owns 0-1 articles (ref.)	see figure 3 for	2110	1.0	456
Owns 2-3 articles	interaction effect	1347	1.2	302
Owns 4-6 articles		888	1.8**	204
Media Exposure				
Has no radio, and doesn't listen (ref.)	1.0	1021	NA	
Has no radio, but listens to radio	1.4***	657		
Has radio	1.3*	2667		
Household Visits by FP Field Workers				
No visit in 6 months (ref.)	see figure 3,4 for	2130	1.0	489
Visited in 6 months	interaction effect	2215	1.2	473
Health Worker Works in the Village				
No (ref.)	1.0	4008	1.0	894
Yes	1.5**	337	1.3	68

***P<.001 **P<.01 *P<.05

ref. = reference category

Table 3(continued)

Logistic Regression Analysis of TT Immunization during Pregnancy and Full Immunization of Children Age 12-23 Months.

	TT Immunization during Pregnancy		Full Immunization of Children	
	Odds Ratio	N	Odds Ratio	N
Proximity to Satellite Clinic				
In the village/within 2 miles (ref.)	1.0	3408	1.0	757
Not held/DK	0.8**	937	0.7**	205
Proximity to Static Health Center				
Within 2 miles (ref.)	see figure 4,5 for	3188	1.0	707
More than 2 miles	interaction effects	1157	0.8	255
Interaction Effects[1]				
Between FP Field Worker visit and birth order	see figure 2		NA	
Between FP Field Worker visit and economic status	see figure 3		NA	
Between proximity to static health center & economic status	see figure 4		NA	
Between proximity to static health center & region	see figure 5		NA	
ALL	**4345**		**962**	

***P<.001 **P<.01 *P<.05

ref. = reference category

1 All the interaction effects included in the model were statistically significant at P<.05

Figure 1: Trend in Tetanus Toxoid Immunization (TT) in Bangladesh

Percent receiving TT Immunization during Pregnancy by Year of Birth.

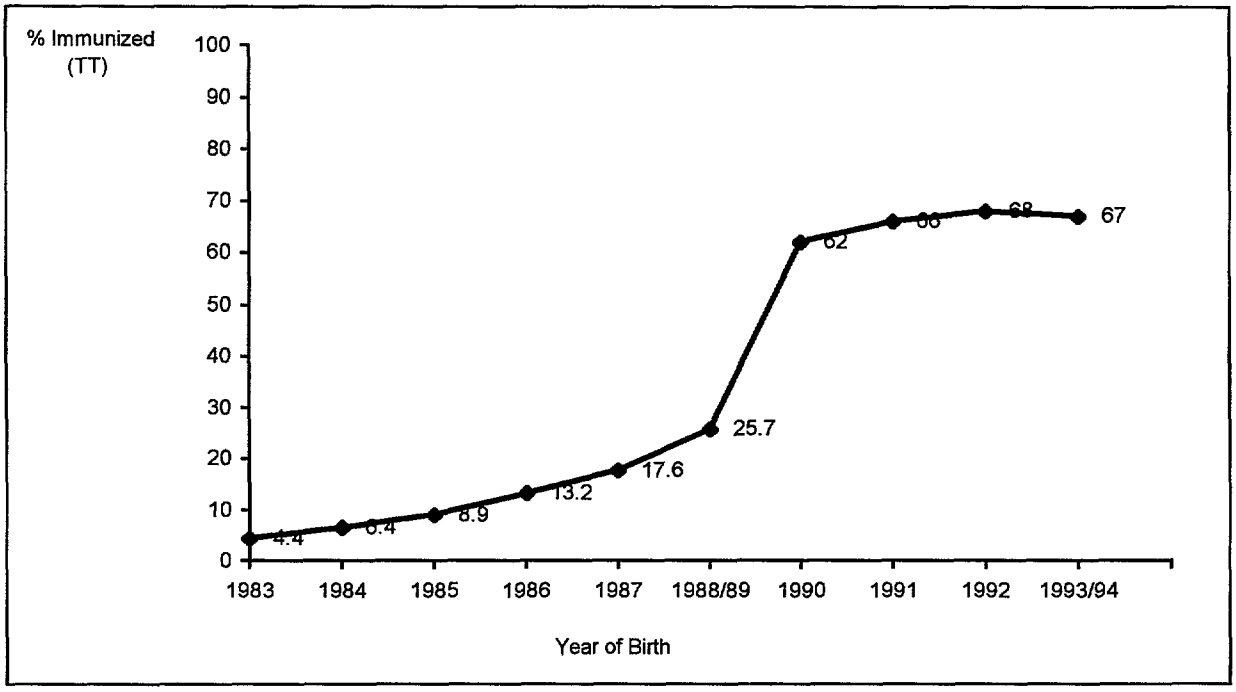


Figure 2: Percent of Births Immunized during Pregnancy by Birth Order and FWA Visit Pattern.

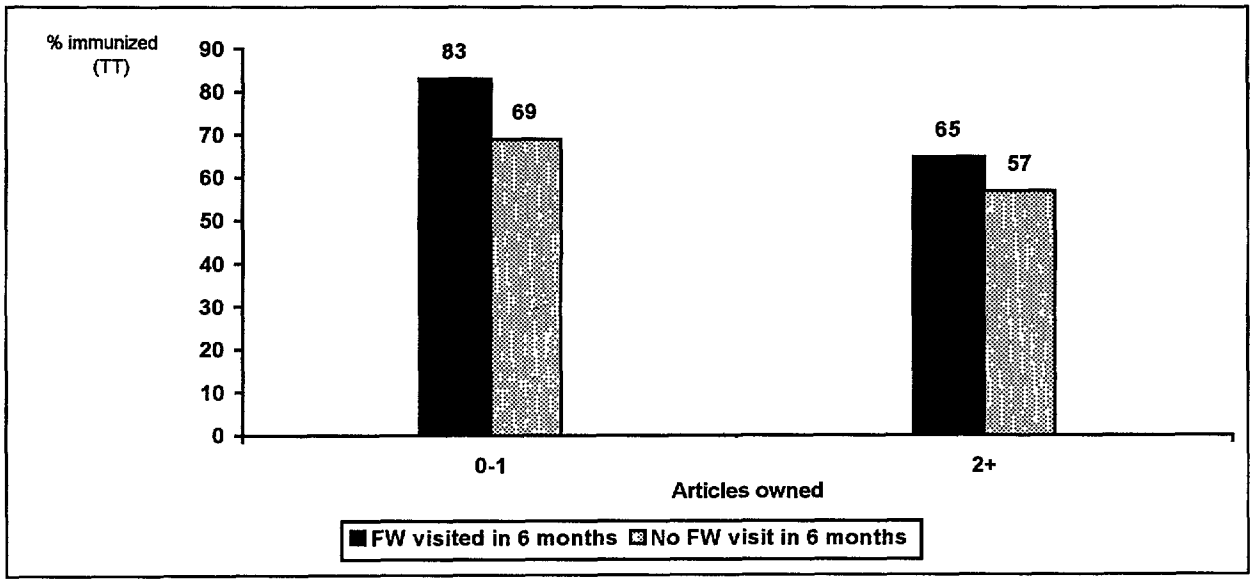


Figure 3 : Percent of Births Immunized during Pregnancy by Economic Status and Field Worker Visitation Pattern.

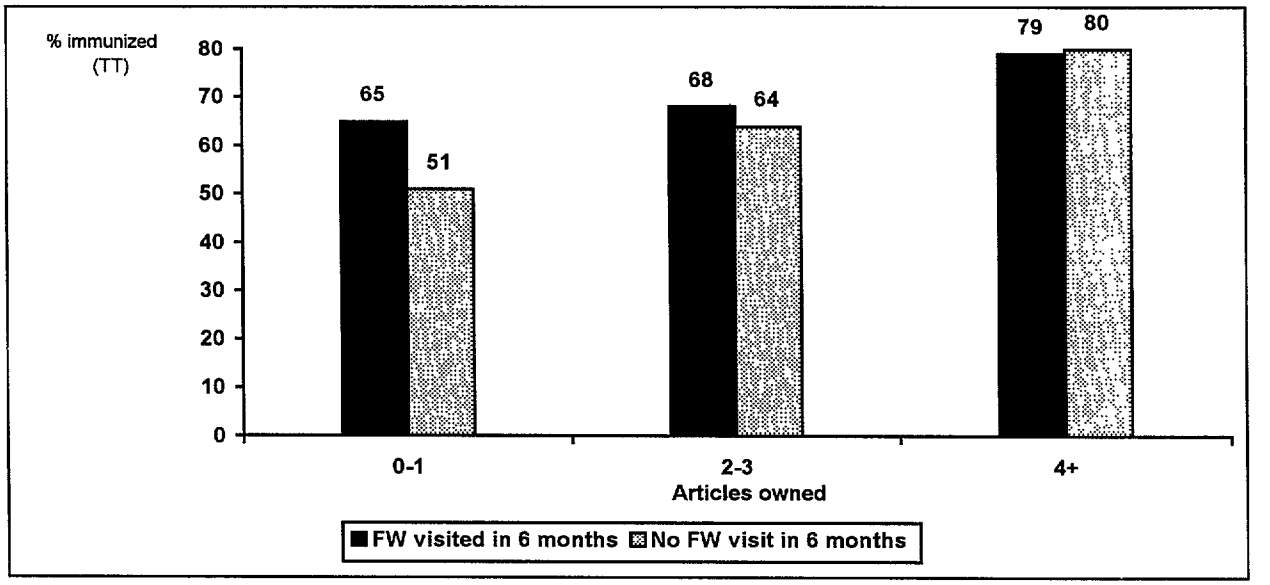


Figure 4: Percent of Births Immunized during Pregnancy by Economic Status and Proximity to Static Health Facility.

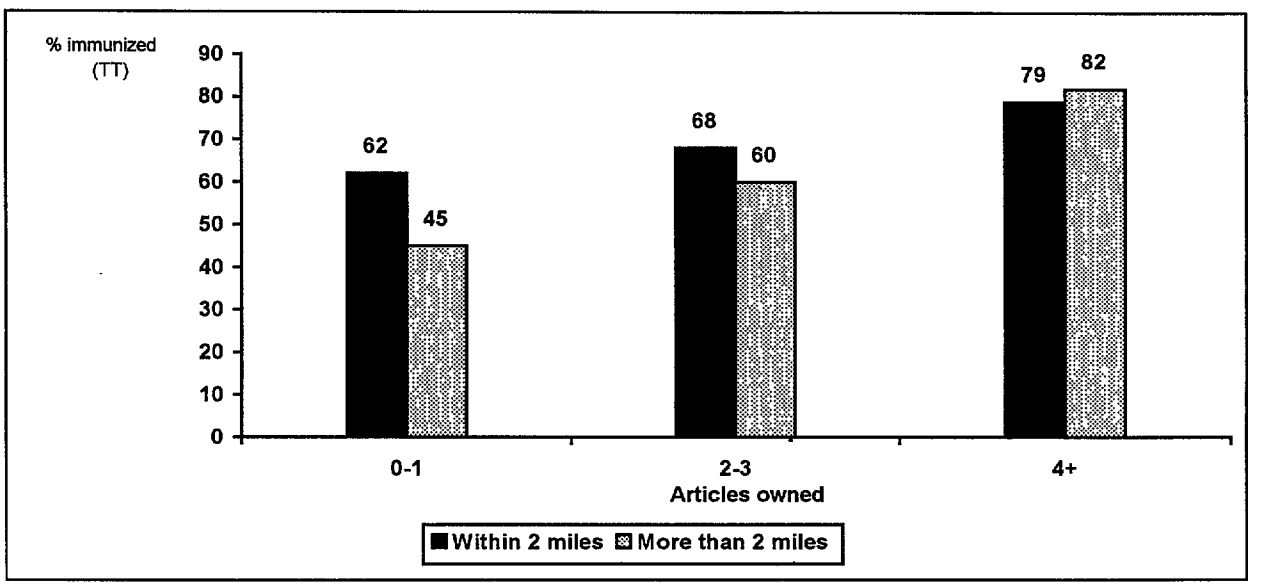
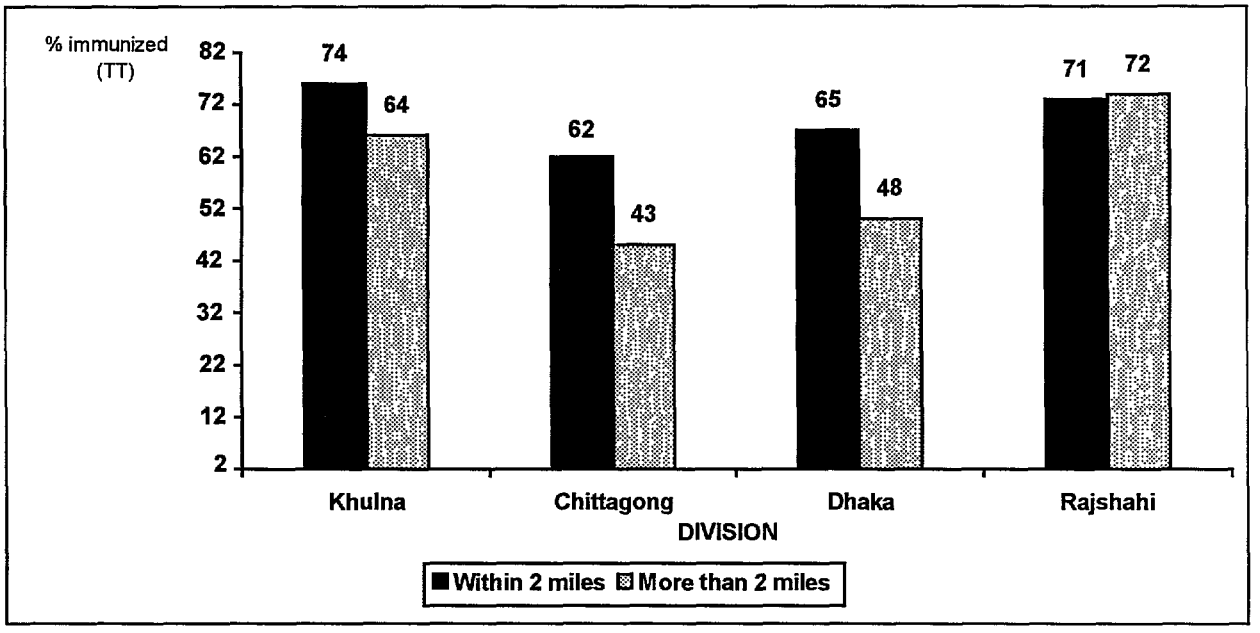


Figure 5: Percent of Births Immunized during Pregnancy by Region and Distance to Health Facility.



Marital Adolescent Reproductive Health in Bangladesh

Nahid Kamal, Kim Streatfield, Sk. Ali Noor

Introduction

The *Centre for Population Options* (CPO, 1992) estimates that nearly 15 million teenage women give birth every year worldwide; that one in 15 teenagers contracts a sexually transmitted disease (STD) each year; and that 20 percent of all people with AIDS contracted the disease during adolescence. According to Population Reports (1995), 20-60 percent of currently pregnant women aged below 20 in Africa and Latin America reported that their pregnancies were mistimed or unwanted. In Bangladesh, 31 percent of currently pregnant women aged below 20 said that their pregnancies were mistimed.

UN (1989) estimates on adolescent reproductive behavior showed that Bangladesh has the highest proportion of women under the age of 20 giving birth every year. *Population Reports* (1995) confirmed this finding. The percentages giving birth before age 20 were 66 percent in Bangladesh, 49 percent in India, 30 percent in Pakistan and 22 percent in the Philippines. Population Reports also revealed that the 15-19 age group in Bangladesh has the highest age-specific-fertility-rate (ASFR) in the Asia and Pacific region with a median age at first birth of 18.3 years.

Marriage and then childbearing is the usual chronology of events in Bangladeshi society. What probably makes the study of reproductive health among Bangladeshi adolescents slightly easier than in other developing countries is that adolescent conception and childbearing almost universally takes place inside marriage. As far as pre-marital or extra-marital sexual relations are concerned, there are no quotable national rates for the country, but as pointed out by Aziz and Maloney (1985), "despite the dire social and religious consequences of pre-marital sex, the behavior is probably typical in Bangladesh".

The focus of this paper is the current situation of adolescent reproductive health as estimated in the 1993-94 BDHS. A complete examination of reproductive health would mean looking at all factors that influence the reproductive behavior of adolescents, but the survey data only allows analysis of marriage, fertility and the use of family planning and mother and child health (FP-MCH) services. A look at trends in determinants of adolescent reproductive health over time may be a useful prologue for a better understanding of the current situation.

The definition of 'adolescence' may vary from society to society since it is a social concept describing the transition from childhood to adulthood. The age range to focus on will depend on the subject and nature of the study as well as the sociocultural traditions prevailing in society. For example, in the Philippines, where the mean age at marriage is 22.4 years for girls (UN, 1995), the second Young

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Adult Fertility Survey (YAFS - II) studied sexuality and reproduction among youth aged 15-24. When studying reproductive health in the context of Bangladesh, where the average age at menarche is 12.8 years and early marriage and childbearing is the norm (the mean age at marriage is 16.7 years for females), it is reasonable to include all girls aged between 13-19 in the category of 'adolescents'.

Most of the analysis in this paper revolves around the three age groups 13-19, 20-34 and 35+. Out of the total sample size of 9640 in the 1993-94 BDHS, there were 1410 cases in the age group 13-19. Occasionally the five year age groups (10-14 and 15-19) have been referred to in order to make trends over time more comparable.

Marriage

Since independence, there have been more impressive changes in the proportions of the female population who were married, by selected age groups, than in the mean age at first marriage. Comparing 1975 BFS and 1993/94 BDHS data, it can be seen that among 10-14 year olds, the percentage of 'never married' had not increased much (from 91.2 percent in 1975 to 95.2 percent in 1993-94). However, for the age group 15-19, the change has been from 29.8 percent in 1975 to 50.5 percent in 1993-94. In other words, only about 50 percent of the female population aged between 15-19 were married in 1993-94 compared with over 70 percent in 1975.

Regarding the age at marriage, the age at first union was studied (which is the age at which the wife started cohabiting with her husband) rather than the age at first marriage. It seems that the mean age at first union may have remained more or less constant for the different cohorts of women; it was 13.5 years for the age group 35+, 14.6 for women aged 20-34 and 14.0 for married adolescents aged 13-19. (However, since not all adolescents have decided on when they will marry, this comparison may be somewhat distorted by censoring.) Analysis of the age difference between husbands and wives shows that the mean age difference has not changed substantially over time. For the three age groups 13-19, 20-34 and 35+, the mean age differences between husband and wife were 9.7 years, 9.4 years and 10.5 years respectively.

Looking at the current marital status of women in the three age groups 13-19, 20-34 and 35+, the percentages who were married were 96.7, 95.0 and 87.8 respectively. The percentage of the age group 13-19 who were 'widowed' is only 0.4 compared with 1.8 for the group 20-34 and 10.4 for women who are over 35. The main explanation for this observation is that young, newly married girls have had a shorter exposure to the risk of widowhood and their husbands are less subject to the risk of mortality.

Considering the fact that younger couples have not had long exposure to marriage, one would expect the rate of divorce/desertion to be lower for adolescents than older women. Surprisingly this is not the case. The percentage of teenagers in the age group 13-19 who were either divorced or deserted was 3.0 percent compared with 3.2 percent of women aged 20-34 and 1.8 percent of women aged 35+. It is possible that the rates of divorce and desertion are actually higher among older women but are underreported due to the social stigma attached to marriage dissolution in Bangladeshi society. The justification for treating divorce and desertion together in the 1993-94 BDHS is probably that it is difficult to distinguish between the two. The reasons or causes for divorce/desertion for the three age

groups, 13-19, 20-34, and 35+ may be totally different, but the BDHS data were not sufficient to examine the causes of marriage dissolution .

Fertility

Age-Specific Fertility and Total Fertility Rates

The total fertility rate for the country has been falling steadily from 6.3 in the period 1971-1975 to 3.4 according to the 1993-94 BDHS. A look at the age specific fertility rates of the different cohorts of women may be useful in determining the contribution of adolescents to the decline in fertility.

Table 1: Comparison of Age-Specific and Total Fertility Rates

Age Group	1975 BFS	1989 BFS	1989 CPS	1991 CPS	1994 BDHS
	1971-75	1984-88	1986-88	1989-91	1991-93
15-19	0.109	0.182	0.171	0.179	0.140
20-24	0.289	0.260	0.241	0.230	0.196
25-29	0.291	0.225	0.217	0.188	0.158
30-34	0.250	0.169	0.160	0.129	0.105
35-39	0.185	0.114	0.109	0.078	0.056
40-44	0.107	0.056	0.053	0.036	0.019
45-49	0.035	0.018	0.014	0.013	0.014
TFR	6.3	5.1	4.8	4.3	3.4

The unusually low figure of 0.109 for the age group 15-19 in the 1971-75 period may be explained by the dampening effects of the 1971 Liberation War and the 1973-74 famine, when postponed or delayed marriages and hence fertility were the most direct and immediate consequences. In the post-crisis period between 1984-88, the ASFR for the same age group increased by 67 percent to 0.182. In general, the trend in fertility for this age group has been somewhat erratic, falling in the period between 1986-88, and then rising, before finally declining again in the 90s. The fertility rates for the older cohorts have been falling steadily since 1975. From the percentage figures in the table above it may be concluded that it was the decline in the ASFRs of the older cohorts, particularly the age groups 20-24 and 25-29, that contributed most to the decline in the TFR over time.

Children Ever Born and Children Still Living

The mean number of children ever born (CEB) and children still living (CSL) for the three age groups are as follows:

Age Groups	Mean CEB	Mean CSL	CSL/CEB
13-19	0.64	0.55	0.86
20-34	2.83	2.70	0.95
35+	5.92	4.78	0.81

In general, the mortality risks for children born to teenage mothers are substantially higher and therefore one would expect the figure in the last column of the above table to be lowest for adolescents mothers. Two explanations may be put forward as to why the above figures are not in accordance with the hypothesis. Firstly, this is a period as opposed to a cohort analysis and the exposure of children born to adolescent mothers is censored. Secondly, older women are likely to have begun childbearing at an earlier age and hence experienced higher infant and child mortality risks.

Table 2: Mean Number of Children Ever Born for All Women

Age Group	1975 BFS	1981 CPS	1985 CPS	1991 CPS	1993-94 BDHS
15-19	0.6	0.5	0.4	0.4	0.3
20-24	2.3	2.0	2.0	1.7	1.6
25-29	4.2	3.7	3.6	3.2	2.9
30-34	5.7	5.4	5.1	4.5	4.1
35-39	6.7	6.4	6.5	5.7	5.2
40-44	7.1	7.3	7.4	6.7	6.5
45-49	6.7	7.6	7.2	7.4	6.9

For the age groups 20-24 and higher, the mean number of children ever born has been declining steadily, with the exception of the oldest group 45-49, where the mean CEB has been fluctuating. For adolescents, the decline in the mean number of CEB has been rather slow; it fell from 0.6 in 1975 to 0.4 in 1985 and finally to 0.3 in 1993-94.

However there do seem to be differences in the fertility behavior of adolescents in the five divisions. The mean number of children ever born to women in Chittagong is 3.77, which is over half a child higher than that in Rajshahi (3.16). Yet the mean number of CEB to adolescents in Chittagong is 0.55 compared with 0.67 for the same cohort of adolescents in Rajshahi. This suggests that although the total fertility rate is higher in Chittagong, women in Rajshahi may commence their childbearing at an earlier age.

Proportion Pregnant

Finally, we want to look at the proportion of adolescents who were pregnant at any point in time. In the 1975 Bangladesh Fertility Survey, 15.2 percent of all adolescents aged below 20 were pregnant. During the 1989 BFS, 14.7 percent of all teenagers aged 15-19 were pregnant, compared to 19.6 percent in the 1991 CPS and 17.1 percent in the 1993/94 BDHS. Hence there is no clear-cut pattern to this trend. However this information is not very useful unless we know if these adolescents were pregnant with their first child or subsequent ones.

The 1991 CPS reports that 29 percent of adolescents aged 15-19 were already mothers and another 7 percent were pregnant with their first child at the time of interview. This survey suggested that adolescent fertility was highest in Rajshahi division followed by Dhaka, Khulna and Chittagong. The 1993-94 BDHS indicated only a slight decline - 27 percent of 15-19 year olds were mothers and another 6 percent were pregnant with their first child. The pattern of teenage fertility by the five

divisions had remained unchanged. The percentage of teenage girls in each division who had begun childbearing at the time of the 1993-94 BDHS was as follows:

Division	Percentage of Adolescents Aged Below 20
Rajshahi	41.0
Khulna	34.9
Dhaka	33.7
Barisal	33.6
Chittagong	25.1

As would be expected, adolescent fertility was higher in rural than urban areas, 34.8 percent of rural adolescents had begun childbearing compared with 20.3 percent of their urban counterparts. There were significant differences by levels of education; 44.8 percent of adolescents with no education as opposed to 16.3 percent with secondary/higher education had begun childbearing. Only 6 percent of teenage mothers had two or more births according to the 1993/94 BDHS.

Fertility Preferences and Ideal Family Size :

The mean ideal family size has been falling among adolescents (as among older women). Between 1989 and 1993/94, the mean ideal number of children fell from 2.5 to 2.3. An interesting finding from the 1993/94 BDHS is that there is no difference in the mean ideal family size of adolescents with no education and those who have completed their primary schooling. However, as would be expected, there are regional variations; adolescents in Chittagong have a mean ideal family size of 2.6 compared with 2.2 for the other four divisions.

Timing of the Last Pregnancy

Finally, an analysis of the 1993/94 DHS data on the timing of the last pregnancy seems to suggest that younger women space/time their pregnancies more effectively than women in the older age groups. A higher proportion of girls aged 13-19 were pregnant at the time of interview - 15.8 percent compared with 9.3 percent of women aged 20-34. This seems reasonable on the grounds that younger, newly married women wish to have a child soon after marriage in order to consolidate their position in their husbands' home. Older women, on the other hand, having had one or more children, tend to be 'spacing; or 'limiting' their fertility at any point in time.

Table 3: Timing of the Last Pregnancy

	13-19(%)	20-34(%)	35+(%)
Then	68.0	59.1	17.1
Later	32.0	24.0	14.3
Not at all	-	16.9	68.6

The majority of 13-19 year olds, 68 percent, wanted the child at that time compared to 59.1 percent of 20-34 year olds and 17.1 percent of women aged over 35. From this table it appears that women who are 35 and over are more likely to mistime their pregnancies - 68.6 percent did not want the child at all. Looking at those pregnant women who either wanted the last child later or not at all and were using contraception, one could get an estimate of the proportion of pregnancies that are due to method failure. Analysis of the 1993/94 BDHS data revealed the following:

Table 4: Percentage of Pregnant Women who did not want a child and were Using Contraception

Age Group	No. of Cases	% Using any Method	% Using Modern Methods
<20	222	4.0	2.7
20-34	504	10.1	5.7
35+	35	22.8	8.6
ALL	761	8.9	5.0

Family Planning

There appear to have been encouraging changes in the behavior of adolescents in the area of family planning. The most impressive changes for adolescents (as well as for all women aged between 15-49) have been between 1975 and 1979 when knowledge of one or more methods of family planning increased by 20.1 and 12.9 percentage points respectively. In 1993-94, there was virtually universal knowledge (over 99 percent) of at least one method of family planning among women of all ages.

Ever Use

Here the behavior of adolescents was compared with that of all women of reproductive age. Between 1975 and 1993-94, ever use of family planning increased by roughly 5.5 times times for adolescents and only 3.5 times for all women.

Table 5: Ever use of all Methods of Family Planning among Ever Married Women

Years	Adolescents (<20)	All Women (10-49)
1975	6.1	13.6
1979	8.8	19.6
1983	18.9	33.4
1985	14.1	32.5
1989	23.8	44.2
1993-94	41.1	63.1

Current Use

The use of all family planning methods, traditional as well as modern, has been on the increase. The general view has been that adolescents prefer traditional to modern methods of family planning. However, since 1985, adolescents have preferred modern rather than traditional methods. In 1975, traditional use comprised 33 percent of the total use of FP among adolescents and 35.4 percent for all women aged 15-49. In 1993/94, when the prevalence of traditional methods had increased to 5.8 percent and 8.4 percent for adolescents and women aged 15-49, respectively, the use of traditional methods comprised 23.7 percent of total use for adolescents and 23.2 percent for all women of reproductive age.

Analysis of the Method Mix among Adolescents

Out of the 24.4 percent of total FP among adolescents, 5.8 percent constitutes traditional methods and 18.6 percent modern methods. For modern methods, the pill is the most widely used 'spacing' method among adolescents followed by condoms, injectables and the IUD. The method mix for the three age groups in this study are presented below:

Table 6: Contraceptive Method Mix among Current Users by Age (1993/94 BDHS)

	13-19	20-34	35+
Pill	49.0	44.8	24.0
IUD	6.8	5.4	2.9
Male Sterilization	0.6	2.2	3.6
Female Sterilization	0.3	13.5	34.7
Condom	11.4	7.4	5.2
Safe Period	14.5	8.8	13.0
Withdrawal	8.0	5.0	5.5
Injectables	8.8	10.8	7.6
Others	0.6	2.0	3.4
Total	100.0	100.0	100.0
Number of Cases	351	2580	1250

Analysis of the 1993/94 DHS suggests that although over 90 percent of adolescents have heard of the pill and know a source for the method, only 29 percent reported having ever used the method. One of the reasons for the low use of the pill among young, newly married women may be fear that hormonal methods might affect their fecundity.

A small percentage, (4 percent for the age group 13-19 and 6 percent for those aged 20-34) is currently using a second method of contraception. Among adolescents, withdrawal is the most common second method used in conjunction with the safe period (as a first method). For pill users, safe period and withdrawal are often used as second methods. Among the age group 20-34, withdrawal is the most widely used second method when the first methods are safe period or the condom.

The BDHS analysis also showed that the proportion of women who start using a method before having had at least one child was greater for the age group 13-19. Among married adolescents, 58.5 percent used contraception prior to their first birth, compared with 18.1 percent of women aged 20-34 and 3.3 percent of women aged 35+. This suggests that even among young, newly married, zero-parity girls, there is considerable interest in controlling their fertility, contrary to the long held view that women normally have at least one child before they start using a FP method.

To test if adolescents are as well informed as are older women, the proportion of each age group that had accurate knowledge of the safe period was examined; 63 percent of adolescents compared with 60 percent of 20-34 year olds and 52 percent of women over 35 correctly identified the safe period. The proportion of women in each age group who had any knowledge of side effects of the methods they were using was then examined. Although 47.1 percent of 13-19 year olds compared with 30 percent of 20-34 year olds and 25 percent of women aged 35+ reported to have some knowledge, only 37 percent of adolescents with knowledge of side effects had received counseling from fieldworkers. This shows that the majority of adolescents find out about the side effects of contraception from family, friends and peers, whereas the main source of information for older women are fieldworkers. This could be because fieldworkers, who are mainly middle aged themselves, find it easier to relate to clients who are their own age. Another interesting finding is that only 18.8 percent of 13-19 year olds, compared with 30 percent of older women, reported having problems with their current method. It could be that younger women are able to deal with side effects better than older women, or simply that they have not had enough exposure to experience the side effects that are normally reported with prolonged use.

There appear to be no significant differences in the level of husband and wife decision-making regarding first use of family planning as opposed to husband alone decision-making by age of the wife. However the study did reveal that husbands of younger wives are more likely to obtain pills and condoms from the source of supply. This could be because there are social restrictions on the movements of young, newly married girls which slowly erodes away after the birth of a first child.

Finally, a look at the various methods of pregnancy termination used by women of different ages revealed that the majority of adolescents (79 percent) who terminate their pregnancies do so using menstrual regulation (MR) whereas older women use other methods of pregnancy termination in addition to menstrual regulation.

Unmet Need

The 1991 CPS and the 1993-94 BDHS used the same definition of 'unmet need' and hence are the only two comparable measures that are available. There appears to have been reasonable improvement in the 2-3 year period, but the greatest unmet need still remains among adolescents. Between 1991 and 1993-94, the level of unmet need for family planning decreased from 27.7 percent to 23.1 percent for the age group 15-19, and from 26.6 percent to 20.6 percent for women aged 20-29. Among adolescents interviewed in the BDHS, there was greater unmet need among girls aged 10-14 than among adolescents aged 15-19; 30.3 percent and 23.1 percent respectively.

Maternal and Child Health (MCH)

Antenatal Care and the Coverage of Tetanus Toxoid (TT)

The concept of 'antenatal care', whereby prospective mothers visit 'health providers' for regular checkups, is relatively new in rural areas. Traditional antenatal care in the country included things like massage and special diet for the mother-to-be, and certain social restrictions on her movements and activities. The Mother and Child Health program was integrated with the Health Service in 1975, but antenatal care was not given much attention until the 1990s. The Fourth Population and Health project, launched in 1990, laid down the following objectives among others:

- prenatal care should cover 50-60 percent of all pregnant women (the figure being 27.5 percent according to the 1993/94 BDHS)
- 40-50 percent of all deliveries should be attended by trained personnel (the current figure is 4.2 percent).

There does not seem to be any emphasis or special attention given to adolescents in the national MCH program despite the fact that there are substantially higher morbidity and mortality risks for adolescent mothers as well as children born to them. The 1993/94 BDHS reports that 31.1 percent of adolescent mothers aged below 20 received some antenatal care during pregnancies three years preceding the survey compared with 26.9 percent of women aged 20-34 and 18.4 percent of women aged 35 and above. Adolescents obtained care from the following sources: 19.8 percent - doctor, 8.8 percent - trained nurse/midwife, 0.3 percent - traditional birth attendants (TBA) and 2.2 percent - other. It would have been useful to see what exactly constitutes an antenatal check-up for the adolescents at the health facilities beside the regular TT injections, but the BDHS did not ask detailed questions on this issue.

According to 1993-94 BDHS data, the mean number of months at the time of the first antenatal checkup for births in the last three years varied between four and five months for the different age groups. For women aged 13-19, the mean was 4.8 months of pregnancy, 4.4 months for women aged 20-34, and 4.0 months for women aged 35+. The fact that older women go for their first antenatal checkup at an earlier stage in their pregnancy means that younger women are either not aware of the importance of these services, or that they have inhibitions about antenatal care, or simply that they find out that they are pregnant quite late. It is also possible that as women get older, they have more decision-making power or autonomy and hence more control over their reproductive health.

Mothers to be are normally advised to go for 12-13 antenatal checkups over the nine months of pregnancy. According to this analysis, the mean number of antenatal visits for women with pregnancies in the last three years for the three age groups was:

Age group	Mean Number of Visits Among Women Who Went for Antenatal Checks
13-19	2.6
20-34	2.8
35+	2.6

The findings above suggest that antenatal coverage levels are well below recommended levels. In addition, there are no systematic differences by age of the mother.

The mean number of tetanus toxoid (TT) injections for births three years prior to interview was 1.5 for mothers aged 13-19, 1.3 for mothers aged 20-34, and .9 among mothers aged 35+. The recommended TT dose is 2.0 for the first pregnancy and 5.0 for lifetime protection, which indicates that TT coverage is still inadequate for many women. It was not possible to examine what proportion of each group had completed the full course of five doses recommended for lifetime protection since the 1993/94 BDHS only collected TT information for births three years prior to the survey. However, the proportion of women who had two or more doses of TT was 58.7 percent for adolescents, 47.1 percent for the age group 20-34 and 34.4 percent for women aged 35+.

Childbirth (Place of Delivery and Characteristics of Birth Attendants) :

Traditionally rural women would go to their natal homes for the first delivery and stay in their husbands' homes for subsequent births. According to the BDHS, the proportion of adolescents who had their last child at their natal home (or homes other than the husband's residence) was 44.0 percent. For the age groups 20-34 and 35+, the proportions having their last births at their natal homes were 18.9 and 5.4 percent, thus suggesting that the rural tradition of going to the natal home for early parity deliveries still holds.

Only 3.0 percent of adolescent mothers went to a health facility for a delivery in the three years preceding the 1993-94 survey compared with 3.5 percent for the entire population of women of reproductive age. In addition, only 3.9 percent of mothers aged below 20 were assisted by a doctor at the time of delivery. The figure for the entire female population aged 10-49 was 4.2 percent. The majority of adolescent mothers, 59.4 percent, were assisted by 'traditional birth attendants', (*dais*), at the time of delivery, followed by 30.4 percent who were assisted by relatives/other. In a situation where 96.6 percent of the deliveries of adolescent mothers are at home, and only 3.9 percent are assisted by a doctor, there are serious health implications for the young mother as well as the child.

Even under optimal conditions, adolescent mothers are more likely than women in their 20s to suffer pregnancy related complications and to die at childbirth. This is not only because of their age but because births to younger women are often first births which carry higher risks than do second, third or fourth births. The risk of death may be two to four times higher, depending on the expecting adolescent's health and socioeconomic status (Population Reports, 1995).

Iron-deficiency anemia, eclampsia, hemorrhage and obstructed labor caused by cephalopelvic disproportion are among the many life-threatening complications facing young mothers. According to Population Reports (1995), an anemic woman is five times more likely to die at childbirth and US studies show that pregnant women under the age of 20 are twice as likely to be anemic as older women. Cephalopelvic disproportion is the situation where the adolescent mother has not matured fully physically and the pelvic opening is not big enough to let the baby out during delivery. In the event of such a complication where it is not possible to perform a cesarean section, the woman's uterus may rupture and both the mother and baby may die. When a woman is giving birth at home with the assistance of a *dai* or a relative/friend, there are no provisions to handle complications like obstructed labor and the mother and/or baby can die from hemorrhage, sepsis and the like. Prolonged labor can also lead to fistula injuries.

The need for adolescent mothers to avail of antenatal care and to go to a health facility for a delivery, especially if they are having their first child, cannot be overemphasized.

Child Immunization and Child Care :

What made the analysis of this section difficult was the fact that among adolescent mothers, the most recent birth was likely to be their first birth. Sufficient time needs to have elapsed between the birth of a child and the time of the interview in order to capture events that are of interest; namely, child immunization and general child care. Since most of the adolescent mothers had their last child (which was also their first birth in the majority of cases) in the recent past, this 'censored exposure' made it difficult to assess or compare their behavior regarding child immunization with that of older women.

In order to overcome this problem for immunization coverage, this analysis examined the coverage of immunization for children aged 12-23 months at the time of the survey. For this sub-group of children, there do not seem to be significant differences by mother's age. Adolescent mothers were as likely to immunize their children for DPT, BCG, Polio and Measles as were older mothers. Among mothers who had children aged between 12 and 23 months at the time of the survey, roughly 60 percent of the mothers in each age group had fully immunized their children for DPT, BCG, Polio and Measles. The mean number of vaccinations received by children aged 12-23 months by the age of the mother at birth was 6.0 for mothers aged 13-19, 6.1 for mothers aged 20-34 and finally 5.8 for those aged 35+.

The analysis then examined whether younger mothers are more likely to seek advice/treatment for child illnesses such as cough. For births in the last three years, a slightly higher proportion (25.1 percent) of adolescent mothers said that they seek treatment for cough compared with 24.1 percent of mothers aged between 20 and 34 and 18.1 percent of mothers aged 35 and above. However, ARI treatment rates are quite low for all age groups.

More adolescent mothers are likely to seek treatment from a medical or traditional doctor when their children get diarrhoea. For births in the last three years with a diarrhoeal event two weeks prior to the survey, 22.2 percent of adolescent mothers compared with 19.6 percent aged between 20-34, and 17.9 percent of women aged 35+ seek treatment. A possible explanation for this could be that older mothers are more "traditional" or conservative than younger mothers regarding child care.

Duration of Breast-Feeding and Post Partum Amenorrhea

For the last birth and second-to-last birth, the mean durations of breast-feeding and post partum amenorrhea (in months) are as follows:

Age Group	Duration of Breast-feeding		Post partum Amenorrhea	
	Last child (months	Second last	Last child (months)	Second last
13-19	12.7	14.1	6.2	6.8
20-34	18.9	17.2	8.9	8.4
35+	20.3	18.5	10.6	10.1

The duration of post partum amenorrhea is longest for the age group 35+ (which has the longest duration of breast-feeding for both birth orders). The purpose of looking at the second-to-last child was to account for the 'censored cases' which is a problem especially for the age group 13-19 (younger women are more likely to have given birth in the recent past in which case they may still have been breast-feeding at the time of the interview). The fact that the duration of breast-feeding gets longer with mother's age for both birth orders suggests that the length of lactation may be getting progressively shorter among younger women.

Conclusion

To sum up, there have been positive changes in the reproductive behavior of adolescents in terms of the timing and extent of use of modern methods of family planning. This manifests itself in the age-specific fertility rate of 15-19 year olds where the ASFR has fallen by 22 percent from 0.179 in the 1989-91 period to 0.140 in the 1991-93 period. The fact adolescent women use MR more in relation to other methods of pregnancy termination implies that there is still unmet need for contraception among Bangladeshi adolescents, and also that they may be moving away from unsafe, traditional methods of pregnancy termination and using professional services.

However the MCH scene is still grim. Antenatal care and delivery practices among adolescent mothers have not yet been given the attention they deserve. The present FP-MCH program does not seem to consider adolescents as a separate group with 'special' needs.

Improving the reproductive health of adolescents would involve bringing about major changes at the societal level. For example, increasing the age at first marriage for girls by creating viable social and economic options. In a situation where the long standing tradition of early marriage and childbearing among Bangladeshi girls is not changing, the only sensible solution is to tailor FP-MCH program interventions according to the needs of adolescents by targeting them as the "high risk" group.

The 1993/94 BDHS asked no questions on reproductive tract infections and sexually transmitted diseases. An examination of the causes of RTIs/STDs would likely reveal that adolescent girls have similar risks to older women. For example, risk factors include poor personal hygiene, especially during menstruation; sexual behavior - it is common for male partners of adolescent girls to pass on STDs to their wives (half of the clients at a clinic in Mumbai, India were men aged 15-35, IPPF 1994); and unhygienic conditions under which abortion and child deliveries are carried out. Some basic knowledge of the causes, symptoms and cures of RTIs and STDs is just as important as knowledge of family planning, pregnancy termination, antenatal care and child care for adolescent girls to improve their reproductive health. After all, an ICPD (1994) objective was to meet the special needs of adolescents and youth, especially young women, by providing access to high quality reproductive health services, among other things.

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CHAPTER III

WOMEN'S STATUS, SPOUSAL RELATION, AND FERTILITY DECLINE

Women's Status and Fertility Behavior in Rural Bangladesh

Mizanur Rahman, Santosh C. Sutradhar

Introduction

It is quite certain that women's status influences fertility regulation behavior in almost all societies of the developing as well as developed countries. In societies or families where women enjoy an egalitarian status compared to men, women can play important roles in the decision making processes affecting desired family size, required actions to achieve desired fertility goals, and other family and reproductive decisions. By any standard, Bangladeshi women have a subordinate position in the family and in the society, primarily because of their seclusion from the labor market and social activities by a patriarchal system and religious proscription. It is generally believed that lower status of women is an important cause of high fertility in the country.

Fertility has declined remarkably in this and the last decade, but total fertility rate is still about 3.5 per woman. The national family planning program has been very successful in bringing fertility down. There is evidence that there has been significant social change including some areas of women's status which are also partly associated with the fertility decline. The family planning program again played a catalytic role in bringing about social change. For example, the very ideas of (a) small family, (b) that the fertility regulation is within the couples' means, and (c) aspirations for the quality of children, have now become the norm in the country.

The national family planning community-based distribution (CBD) program has tried to reach the village women through grass-root level workers to provide information and supplies. The program has been very successful in creating awareness of ways of having small families and thus, increasing contraceptive use. This is one way of empowering women through information and accessibility to services.

In rural Bangladesh, decisions about family size and contraceptive practice to achieve the desired size may still be a part, to a large extent, of the domain of broader family decisions which are mostly made by the men, in particular, and the clan (parents-in-law and other male and female kin of the husband). However, women who have a higher opportunity of enjoying a relatively improved status in the family are more likely to participate in the decision making processes, particularly in the areas of family formation and reproductive health. Thus, they are more likely to be better family planning and health performers.

The 1993/94 Bangladesh Demographic and Health Survey provides an opportunity to have some variables that capture behavior that reflects women's status. The variables are: discussion between the wife and husband about fertility decisions and contraceptive use, women's mobility, women's

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participation in the labor force and NGO activities (Table 2). Discussion between husbands and wives regarding any family decision facilitates exercising bargain power of wife. Therefore, discussion between husband and wife regarding family size and contraceptive use may indicate that (1) either the wife, who received information from the family planning CBD workers, has communicated to the husband, or (2) the husband communicated with the wife about small families and contraceptive use, or (3) they make joint decisions regarding family formation and reproductive health. The variables which capture the ability of a woman's mobility (to move outside the village or to a clinic) are indicators of women's status. These are important from programmatic points of view. Those women who are able to go outside their village can obtain maternal and child health and family planning services from fixed-site service centers. A woman who earns income contributes to family wealth and is highly likely to directly participate in any decision making processes in the family. A female NGO member usually borrows money from the NGO, earns income, and participates in the family decision making processes. Moreover, she is likely to bring family welfare and quality of life messages that are disseminated by the NGOs. In addition, maternal education is a strong indicator of women's status, and therefore, educated women can participate in decisions that influence family formation and reproductive health.

Our hypothesis is that these variables are associated with fertility behavior, mainly desired fertility, fertility regulation (contraceptive use), and actual fertility. The objective of this paper is to test this hypothesis. We use the 1993/94 BDHS data of only rural areas. Appropriate statistical techniques are used to examine the associations between the above-mentioned variables and fertility behavior, after controlling for the effects of socioeconomic, cultural, and programmatic variables that are likely to influence both fertility behavior and women's status.

Methods and Materials

The analysis includes 6,863 married women of reproductive age (MWRA) from the rural sample of the 1993-94 BDHS (excluding the respondents who were pregnant during the survey). Table 1 shows the basic data on the sample.

Three variables of fertility were used as dependent variables. First, desired fertility: women who reported, during the survey, that they do not want anymore children were treated as cases against those women who wanted to have additional children as controls. Second, contraceptive use: women who were using any form of contraception (traditional or modern) during the survey were regarded as cases and non-users as non-cases. Third, actual fertility: the interval (in months) between two live births; the first interval of woman was the interval between the marriage and the first birth.

Desired fertility and contraceptive use were modeled in logistic regression. The independent variables that capture measures of women's status, socioeconomic conditions, programmatic influences, geographical variation, and demographic characteristics are included in the logistic models of desired fertility and contraceptive use. Table 2 shows the distributions of the independent variables. Bivariate relationships between independent variables and contraceptive use and desired fertility are also shown in Table 2.

The fertility analysis was longitudinal and proportional hazards models were used to examine the effects of maternal education. Three independent variables, husband's education, religion, and

geographical division were included in the models as control variables. These were treated as fixed covariates. Maternal age and parity were included as parity-varying independent covariates in the proportional hazards models. The other independent variables shown in Table 2 are based on current status and information were not included in the longitudinal analysis.

Based on the birth interval information of all births of each women prior to the survey, individual records for each birth were created. Among the 6,863 sample women, a total of 33,702 live births were born during the period between 1960 and 1994. These live birth intervals were considered in the analysis. An interval between two live births or that between marriage and the first birth is a closed interval. An open interval was treated as a censored event in the proportional hazards regression.

Bivariate exploratory analysis of fertility was done in life tables. The probability of having a subsequent birth in a three-year period is displayed in Figure 1. The synthetic or reconstructed longitudinal results based on a retrospective survey match with the expectation of fertility decline. This is a reflection of data quality of the 1993/94 BDHS survey. The three-year probability of births has declined from about 0.58 in 1960-69 to about 0.46 in 1990-94, indicating a sharp decline of fertility in Bangladesh. Some decline of fertility apparently occurred during 1970-74 and then an increase took place during 1975-79. This probably reflects the fertility reduction thought to have taken place during the liberation period in 1971 and the subsequent famine period in 1974-75. A post-famine increase of fertility after 1975 is also observed in Figure 1. The onset of sharp a decline in fertility during 1985-89 matches with the momentum of the national family planning program. Figure 2 shows that fertility reduction was substantial in Khulna and Rajshahi Divisions, it was noticeable in Dhaka Division after 1984, and fertility has only slightly declined after 1984 in Chittagong Division.

Results

Tables 3 and 4 show the logistic regression coefficients of independent variables that are associated with desired fertility and contraceptive use, respectively. There are six models in each table; Model 1 includes only four variables that capture communication between wife and husband regarding family planning and desired family size and women's ability of going out of the home for a social purpose and taking a child to a clinic or hospital. Model 2 adds to Model 1 the variables on woman's participation in income-earning and NGO activities. In Model 3, social and economic variables are included, in addition to those in Model 2. These are: maternal and husband's education, husband's occupation, whether or not there is electricity at the house, whether or not the household has a radio, whether or not the household owns cultivable land, and religion of the respondent. Model 4 adds to Model 3, maternal age and parity, including their squared terms to capture non-linear effects. Model 5 adds two variables if the woman was visited by a Family Welfare Assistant (FWA) in the last six months and women's knowledge about contraceptive methods. The last model, Model 6 includes "division" as a variable.

Desired Fertility

The likelihood of wanting no more children was significantly higher for a woman who discussed about family planning with her husband than a woman who did not (Table 3). Similarly, the likelihood of

wanting no more children was higher for a woman who discussed family size with her husband. A woman who can go outside her village alone or with her children had a higher likelihood of wanting no additional children. Similarly, a woman who can go to clinic or hospital alone or with children had a higher likelihood of wanting no additional children. With the inclusion of other variables, associations between the variables that capture communication between husband and wife and desired fertility increase about 2-3 times (Model 4, Table 3). However, the association between the woman's ability of going outside her village and desired fertility (Model 3, Table 3), slightly declines but remains significant while that between woman's ability of going to clinic and desired fertility becomes insignificant (Model 4, Table 3). The disappearance of the significance of the latter variable may be due to multicolinearity as woman's ability of going outside her village and to a clinic are highly correlated.

The associations of these three significant variables with desired fertility decline slightly but remain highly significant with the inclusion of programmatic and regional variation measures (Model 6, Table 3). Participation of a woman in the labor force is never significantly associated with desired fertility. The participation of a woman in NGO is positively and significantly associated with wanting no more children. The strength of association decreases with the inclusion of social, demographic, and programmatic variables, but loses its significance after the inclusion of the regional variable in Model 6 of Table 3. This probably indicates that NGO activities are more effective in influencing desired fertility in some divisions than others. The variable "NGO-participation" may also be capturing some divisional differences, which means that NGO activities are common where desired fertility is lower.

The associations between socioeconomic variables from "maternal education" through "has a radio" and desired fertility are not significant and the coefficients are also small. There are two explanations for these results. First, the idea of a small family has probably been widespread in the rural society across different socioeconomic groups, resulting in no differences of desired fertility among groups. Second, a more appropriate explanation from the statistical modeling point of view, is that the husband-wife communication variables are intermediate variables through which socioeconomic variables affect desired fertility. For example, more educated husbands and/or wives are more likely to discuss family formation issues than less or un-educated ones. Therefore, once the covariates and their proximate determinants (which capture a large part of the effect of the covariates) are in the same model, the coefficients of the covariates may not be significant.

The likelihood of wanting no more children was lower among those women whose households own some land than those who own no land (significant at 10% level) suggesting that land owners desire more children. This is probably not surprising in that those who have plenty of cultivable land need more children, particularly sons, who can help parents on the farm. This relationship also probably partially supports the unfortunate and so-called "poverty-driven" hypothesis of fertility decline in Bangladesh.

Non-Muslims have significantly lower likelihood of desiring more children as shown in Model 6 in Table 3. It is noticeable that the coefficient of "Non-Muslim" sharply increases from Model 3 to Model 4 (which includes demographic variables) and continues steadily increasing with the inclusion of programmatic and regional variables.

Since the demographic, programmatic, and regional variables are not the focus of this study, we will not discuss their association with fertility regulation behavior in detail. Some important findings are reported briefly. Wanting no more children is not associated with maternal age (Table 3, Model 6) but it increases with parity and then declines after about eight children. These results indicate, and probably rightly, that desire for additional children depends on how many children a mother has but not on her age. The more children a woman has the more likely it is that she will not want additional children. However, the likelihood of wanting more children by those who already have more than eight probably reflects an unusual preference of a special group who want to have very large families.

Fieldworker activity was not associated with desired fertility, which probably reflects the widespread desire for small families. In any case, one might expect that a FWA could be more likely to visit those women who do not want to have additional children because the former would consider the latter as potential users. If this is the case, one would expect that there might have been a positive association between FWA visits and desire for no more children.

Those women who had knowledge about more contraceptive methods tended to have fewer children, as indicated by the positive and significant association between knowledge about contraceptive methods and wanting no more children. This probably indicates that women who want to have fewer children tend to acquire information about means of achieving desired family size and knowledge about more methods.

There was a strong regional variation of desired fertility. The likelihood of wanting no more children was 2.30 times higher among women in Rajshahi, 2.38 times higher among women in Khulna, 1.53 times higher among women in Dhaka, and 1.80 times among women in Barisal than Chittagong. Desire for no additional children in Khulna and Rajshahi Divisions was significantly higher than Barisal and Dhaka Divisions.

Contraceptive Use

Logistic regression coefficients of factors associated with contraceptive use are presented in Table 4. The two variables that capture husband-wife communication appear to have highly significant and positive associations with contraceptive use (as was the case for desired fertility). The coefficients of these two variables are quite stable over the six models in Table 4, contrary to various models of desired fertility in Table 3. The absolute strength of association between couples' discussions about family planning and contraceptive use is higher than the association between these variables and desired fertility. The association between couples' discussion about family size and contraceptive use is slightly lower than the association between couples discussion about family size and desired fertility.

Women's ability of going outside the village or going to clinic was significantly associated with contraceptive use before controlling for the effects of demographic, programmatic, socioeconomic, and regional variables, but was no longer significant in Model 6 (Table 4). Therefore, women's mobility is not associated with contraceptive use.

Although desired fertility was not associated with women's work, contraceptive use was significantly higher among women who participate in income-earning activities. The association steadily declines

over models which include demographic, programmatic, and regional variables. The higher contraceptive use of women who work for income may indicate the opportunity cost of childbearing. It is also possible that women who participate in the labor force need more contraceptives than others to compensate for the effect of lower breastfeeding of their children, which results from incompatibility of work and breastfeeding. Increased labor force participation of women is likely to accelerate the pace of fertility decline in Bangladesh.

NGO members are not likely to practice contraception more than their non-member counterparts as shown in Table 4 (Model 6). Desired fertility was also not different for members and non-members. These findings are not consistent with studies that were specifically designed to examine the impact of NGOs on fertility preferences and fertility regulation. It may be noted that NGO members are usually landless. An appropriate analysis would be to compare their behavior with their landless counterparts.

Regarding the association between socioeconomic variables and contraceptive use, the results are almost similar to those found, in Table 3 for desired fertility. Husband's education and occupation, and having electricity and radio were not associated with contraceptive use. Although desired fertility was not associated with maternal education, contraceptive use was higher among women who have more than primary-level education. More educated women may have greater motivation to use contraception to reach desired levels family size goals. In addition, educated woman may be less likely to have prolonged lactation and therefore need to adopt contraceptive methods earlier than the latter. Land owners have lower contraceptive use than landless respondents (Table 4, Model 6) which is consistent with the findings, in Table 3, that farmers desire larger families. In addition, non-Muslims have higher contraceptive use than Muslim.

Contraceptive use increases with maternal age, reaching the highest at around 40 years of age and then decreasing (Table 4, Model 6). The onset of menopause starts around age 40 years and increases with age. Moreover, older women may think that they do not require contraception at that age because of their perception that they are no at the risk of conception. There may be a cohort effect also, the older cohort are generally more conservative than the younger cohort and therefore they may have lower contraceptive use than the relatively younger cohort. Contraceptive use, as expected, sharply increases with parity but declines after the fifth parity. The decline of contraceptive use among mothers who already have many children probably reflects their lack of motivation for family limitation. Putting it differently, they had many children because they did not use contraceptives. The lower contraceptive use among women who were married at relatively older age (negative coefficient of age at marriage) probably indicates that they defer contraceptive use in order to achieve desired fertility since they have started having children at a later age.

The likelihood of contraceptive use was substantially and significantly higher among women who were visited by FWAs at their homes in last six months. This is very much expected in the CBD program. However, the strong positive association between worker contact and contraceptive use suffers from a bias associated with the problem of reverse causality. The probability of worker contact at the homes of the contraceptive users is likely to be higher, since the workers would have contacted the users in the recent past to replenish contraceptive supplies. In contrast, the frequency of contacts with non-users would be low, since the workers probably were not required to contact them in order to supply methods.

Contraceptive use was higher among women who had knowledge about more methods; (Table 4, Model 6). Desired fertility was also lower among women with more knowledge (Table 3). These findings indicate that women who are motivated to have fewer children acquire information about as many methods as possible, and also use them.

There is a very strong regional variation of contraceptive use in rural Bangladesh. Women in the Khulna and Rajshahi Divisions had about 3 times higher chance of contraceptive use than those of Chittagong Division (Table 4, Model 6). Similarly, women of Dhaka and Barisal Divisions had 1.38-1.91 times higher likelihood of contraceptive use than those of Chittagong Divisions. These findings are consistent with the large variation of desired fertility by division, as observed in Table 3. The regional differentials of contraceptive use are more pronounced than those of desired fertility. This probably reflects a program-effect. For example, the likelihood of wanting no more children was 2.30 [exp (0.833); Model 6, Table 3] times higher in Rajshahi than Chittagong while that of contraceptive use was 2.95 [exp (1.080); Model 6, Table 4] times higher. This (2.95/2.30=1.28) 28 percent higher use of contraception relative to desired fertility in Rajshahi compared to Chittagong is most likely to be attributable to the former divisions stronger family planning program efforts meaning that the Rajshahi program has been better able to meet contraceptive needs than Chittagong Division.

Fertility

Longitudinal analysis of fertility during 1960-94 was based on retrospectively collected birth intervals. Fertility was modelled in proportional hazards regressions, and the results are presented in Table 5. The primary focus, in this section, is the effect of maternal education as an indicator of women's status. The models are developed in such a way that the analysis takes full advantage of the longitudinal analysis. The analysis, in Model 3 of Table 5, allows an examination of the changing effects of the variables on the likelihood of having a birth.

Coefficients of Model 3 of Table 5 explain the dynamics of fertility change in rural Bangladesh from the 1960s to the early 1990s. Coefficients of variables without interactions refer to all the reference categories. For example, the coefficient of the "Birth year" 1975-84 indicates that the likelihood of having a birth increased by about 17 percent [exp (0.155)] during 1975-84 compared to 1960-74 in Chittagong Division among uneducated (wife or husband) or Muslims. Or, fertility was over nine percent [exp (0.090)] higher among a woman whose husband had higher than secondary education compared to others, again, during 1960-74 or in Chittagong Division. But subsequently, fertility has declined at a faster pace among the educated husbands in 1975-84, and more so in 1985-94 as indicated by the coefficients of interactions between husband's "high" education and time periods. Similarly, during 1960-64, fertility between Non-Muslims and Muslims was not significantly different, but Non-Muslims had significantly lower fertility than Muslims during 1975-84. However, the religious differentials have disappeared in the later period. During 1960-74, only Khulna division had eight percent [exp (0.083)] lower fertility than Chittagong and other divisions. The coefficients of the interactions between divisions and time periods indicate that fertility decline has been the fastest in Rajshahi, followed by Khulna, and Barisal and Dhaka Divisions. There has not yet been any significant decline of fertility in Chittagong Division, as indicated by the coefficients of time-period, division, and their interaction terms. Such a pattern of fertility decline by division is also evident in Figure 2.

The coefficient of the variable "maternal education" indicates that there was no effect for this variable in relation to the likelihood of a birth. This is a puzzle, but there are a number of explanations for this finding. The probable reason that the effect of maternal education is not observed because of multicolinearity (correlation between husband and wife's education) deserves an explanation. Our impression is that this is not the case. The explanations of null effect of maternal education of fertility can be divided into two groups: (a) methodological and (b) substantive. First, maternal education alone (excluding husband's education) was included in various models, we found that this variable did not have consistent effect on the likelihood of a birth.

Second, a question may arise how accurate the information may be in terms of reporting of birth history and thus birth intervals, particularly in the distant past, say, 30-34 years ago. But Figure 1 shows that genuine fertility fluctuations related to the liberation war and the famine, that occurred 20-25 years ago, are reflected in the data. This indicates that the quality of birth history data is good.

Third, there is a possibility of socioeconomic differential of recall lapse of birth reporting, particularly in the distant past. For example, it may be such that uneducated women who experience higher infant and child mortality (which was very high in the past) are more likely to under-report these children in the birth history. This would artificially result in lower fertility among uneducated than educated leading to no fertility differentials by maternal education. This possibility can only be singled-out by doing a diagnostic study of birth history reporting.

However, the possibility that there is no significant differences of fertility between uneducated and educated women in rural areas of Bangladesh can not be ruled out. It is possible that the fertility reduction in rural Bangladesh has occurred among all women regardless of education. We find, in this paper, that maternal education was not associated with desired fertility in 1993-94 (Table 3, Model 6). However, in contrast, we also find that contraceptive use was higher among educated than uneducated women (Table 4, Model 6).

Educated women need to practice contraceptives more than uneducated because of their early initiation of infant supplementation. We find that the likelihood of resumption of menstruation was about 14 percent higher among women with more than primary education, other things being the same (data are not shown here). Therefore, higher contraceptive use of educated women partially compensates the effect of lower lactational infecundability.

We do not like to conclude that maternal education does not affect fertility. Rather we would like to tie the findings that husband's education negatively affect fertility and husband-wife communication is very important for fertility desire and limitation. With this approach, we find that couples' education, husband-wife communication, and decision making about fertility regulation involving husband significantly affect family formation in rural Bangladesh.

Discussion and Conclusions

We examine if fertility behavior is associated with some indicators of women's status in rural Bangladesh using the 1993-94 Bangladesh Demographic and Health Survey (BDHS) data. The variables that are considered to capture some aspects of women's status are: discussion between

husband and wife about desired fertility or contraceptive use, woman's ability of going outside village or to a clinic for her own or children's health care, woman's work for income-earning, woman's membership in NGO, and woman's education. Desired fertility (whether or not a woman want to have additional children) and contraceptive use during the survey were two dependent variables. Live birth interval was another dependent variable as an indicator of actual fertility. The association between fertility behavior and the above-mentioned women's status-related variables was examined in logistic and proportional hazards regression models after controlling for the effects of various demographic social, economic, programmatic, and regional variables.

We find that discussion between husband and wife about family size and/or contraceptive use are the two variables that are significantly, strongly, and positively associated with wanting no more children and contraceptive use. Woman's ability of going outside village is positively associated with wanting no more child but not with contraceptive use. Woman's participation in income-earning and maternal education are positively associated with contraceptive use but not with wanting no more children. Longitudinal analysis shows that the pace of fertility decline has been fastest, over the period of last 20 years, among the women whose husbands are educated.

A discussion on the policy implications of the findings is in order. All the above factors that have positive influence on fertility regulation behavior are likely to improve with positive social and economic changes. Such changes are occurring in Bangladesh such as increased school enrollment of children, especially of girls, women's participation in labor force, women's mobility, and others. These are happening partly spontaneously and partly due to the Government and NGO development programs. Social changes need relatively a long time to have impact on any human behavior or life styles, but innovative interventions of development program can accelerate the process of social change and thus life style.

How our findings can help the health and family planning programs design appropriate interventions for fertility changes? We find that discussion between husband and wife about family formation (desired family size and contraceptive use) is very important. We hypothesized that decision about family size and contraceptive use to achieved the desired family size, is an important part of the domain of broader family decisions. The men, in this case, husbands, must play a crucial role. A woman whose husband is already convinced about small family is more likely to be in a position to space or limit her fertility because the husband is likely to motivate and/or support her to do so. This is how male's role is important in family planning. Consider another example, a woman is convinced about small family and contraceptive use (e.g., through CBD female FP workers), she has to convince her husband (some times also parents-in-law and others) for an effective action, that is, for contraceptive use. A discussion between the spouses is necessary and the husband has to be supportive of contraceptive use. Therefore, again, male's role is important in family planning.

The national family planning program is directed towards women through the female workers who visit house-to-house and interact with the individual woman for counseling and contraceptive supplies. Males, that is, the husbands by design are not directly the clientele population of the FP workers. It lies on the wives capability of motivating husbands for family planning.

There are means of motivating men for family planning mainly on mass media, for example, to promote condoms or vasectomies. These are not sufficient. Mass media should be strengthened to

motivate males to take greater share of their responsibilities of family planning and reproductive health.

To work with the male clients (or husbands of the female clients) at the individual level, there are already a large number of Government male workers of various agencies who provide information and/or services to men at the community level. The agencies are: Agricultural Extension, Ansar and VDP, Bangladesh Rural Development Board (BRDB), Education, Family Planning, Health, and Social Welfare. On average, there are about 13 Government employed male workers (Agriculture-3, Ansar and VDP-1, Health-6, Family Planning-2, and Social Welfare-1) per union. A BRDB Inspector (male) works with men to organize credit groups. A union has an average of 4,000 eligible couples, that is, 4,000 men who are supposed to be contacted by the male workers for delivering their services. Ideally, all workers are supposed to promote the idea of small family because all the agencies have the common goal which is family welfare or quality of life. This can be better achieved in small families. These male workers can be better utilized to inform and motivate males to assume their responsibilities of family planning and reproductive health along with their wives. This can be done through a systematic networking mechanism of various agencies and their workers.

There are, on average, 40 primary school, 20 secondary school, and 20 madrasha teachers, most of whom are men, per union. Their primary job is to teach but these male workforce, who are regarded as respectable and knowledgeable by the community, can also be utilized for motivating and counselling males so that males share their responsibilities with their wives regarding family planning and reproductive health.

Gaining support of men for allowing and/or encouraging their wives to go out of home to obtain health and maternal and child health and family planning (MCH-FP) services will facilitate higher utilization of fixed-site service centers (EPI session, SC, H&FWC, and THC) (Quality of MCH-FP services is better at service centers than at homes). This can help develop greater acceptance of procuring health and family planning services from fixed-site service centers in Bangladesh.

Table 1: Basic Data on Sample Selection for the Study

Independent variables	Number		Percent Using Contraceptives	
	Unweighted	Weighted	Unweighted	Weighted
Total BDHS sample	9,640	9,640		
Currently married women 10-49	8,988	8,979	46.0	44.6
Rural	7,637	7,966	44.7	43.3
Urban	1,351	1,013	53.7	54.4
Total rural sample	7,637	7,966	44.7	43.3
<15	128	131	25.0	24.6
15-49	7,509	7,834	45.0	43.6
Rural sample (15-49)				
Pregnant	646	690		
Non-pregnant (study sample)	6,863	7,144	49.2	47.8

Table 2: Distribution of Currently Married Women Aged 15-49 According to Categories of Independent Variables, Status of Contraceptive Use, and Desired Fertility

Independent variables	Number (%)	Percent Using Contraceptives	Percent Wanting No More Children
All	6,863 (100.0)	49.2	56.1
Talked with husband about family planning in last year:			
None[a]	2,212 (32.2)	28.9	53.3
Once or twice	2,639 (38.5)	53.0	56.9
More often	2,008 (29.3)	66.7	57.3
Did couples ever discuss about desired family planning size:			
No[a]	1,632 (23.8)	28.7	58.3
Yes	5,220 (76.2)	55.7	55.4
Can woman go outside village?			
Not allowed to go[a]	1,610 (23.5)	37.4	38.9
Can go alone	2,643 (38.5)	55.9	60.6
Can go with a child	2,606 (38.0)	49.9	62.7
Can woman go to clinic/hospital?			
Not allowed to go[a]	1,520 (22.2)	36.9	38.8
Can go alone	2,411 (35.2)	55.7	59.8
Can go with a child	2,924 (42.7)	50.3	62.6
Work for income-earning:			
No[a]	5,751 (85.3)	47.3	55.3
Yes	1,008 (14.7)	60.7	61.3
Membership in NGO:			
No[a]	5,423 (79.0)	47.2	53.9
Yes	1,440 (21.0)	56.8	64.4

Table 2: Continued

Independent variables	Number (%)	Percent Using Contraceptives	Percent Wanting No More Children
Maternal education:			
None[a]	4,150 (60.5)	46.0	58.5
Primary	1,882 (27.4)	52.3	56.8
Above primary	831 (12.1)	58.6	44.0
Husband's education:			
None[a]	3,321 (48.4)	46.2	54.7
Primary	1,656 (24.1)	48.9	58.5
Above primary	1,886 (27.5)	55.0	56.1
Husband's occupation:			
Agriculture	3,096 (45.0)	55.1	56.8
Business	2,102 (30.6)	52.4	58.2
Labor	1,670 (24.3)	43.8	52.0
Has electricity at home:			
No[a]	6,038 (88.0)	48.7	56.0
Yes	825 (12.0)	53.1	56.7
Has a radio:			
No[a]	5,009 (73.0)	47.2	56.5
Yes	1,854 (27.0)	54.8	55.0
Owns land:			
No[a]	2,620 (38.2)	48.3	54.5
Yes	4,243 (61.8)	49.9	56.8
Religion:			
Muslim[a]	5,987 (87.2)	47.8	59.3
Non-muslim	876 (12.8)	58.9	55.6
Maternal age:			
15-19	904 (13.2)	30.8	6.9
20-24	1,457 (21.2)	42.9	32.6
25-29	1,444 (21.0)	56.0	59.9
30-34	1,079 (15.7)	62.0	80.3
35-39	875 (12.7)	60.8	90.0
40-44	651 (9.5)	51.9	94.9
45-49	453 (6.6)	28.5	97.1
Number of living children:			
0	672 (9.8)	16.8	0.9
1	1,180 (17.2)	40.2	6.2
2	1,410 (20.5)	53.6	54.5
3	1,197 (17.4)	60.7	78.6
4+	2,404 (35.0)	54.5	94.4
FWA's home visits in last 6 months:			
No[a]	4,102 (60.1)	38.2	51.6
Yes	2,718 (39.9)	68.1	61.7

Table 2: Continued

Independent variables	Number (%)	Percent Using Contraceptives	Percent Wanting No More Children
Knowledge of contraceptive methods[a]:			
<=6 methods[a]	2,230 (32.5)	31.6	48.0
7+ methods	4,633 (67.5)	57.8	59.8
Division:			
Barisal	747 (10.9)	52.5	60.2
Chittagong[a]	1,397 (20.4)	31.9	54.9
Dhaka	1,858 (27.1)	44.5	53.3
Khulna	931 (13.6)	59.9	58.1
Rajshahi	1,930 (28.1)	60.0	57.0

[a]: The category is treated as the reference category in the logistic (Tables 3 and 4) and proportional hazards models (Table 5).

[b]: The methods are: Pills, condoms, vaginal methods, injectables, IUDs, tubectomies, vasectomies, period abstinence, and other traditional methods.

Table 3: Logistic Regression Coefficients of Factors Associated with Desired Fertility (Wanting No More Children) (n=5,879)[a]

Independent variable	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6
Constant	-0.577***	-0.678***	-0.683***	-6.504***	-6.556***	-7.436***					
Talked with husband about family planning in last year:											
Once or Twice	0.277***	0.269***	0.295***	0.673***	0.614***	0.562***					
More often	0.283***	0.273***	0.328***	0.925***	0.838***	0.762***					
Couples ever discussed about family size	0.298***	0.318***	-0.297***	-0.576***	0.521***	0.529***					
Can woman go outside village:											
Can go alone	0.596***	0.584***	0.591***	0.475**	0.462		0.418*				
Can go with a child	0.594***	0.589*		0.584*		0.373*		0.360*		0.328*	
Can woman go clinic/hospital:											
Can go alone	0.406***	0.360*		0.394*		0.006		-0.023		0.024	
Can go with a child	0.523***	0.506**		0.499**		-0.180		-0.190		-0.141	
Work for income-earning			0.132		0.135		0.062		0.033		-0.034
Member of NGO			0.361***	0.371***	0.233*		0.201*		0.153		
Maternal education:											
Primary					-0.238		0.122		0.091		0.072
Above primary					-1.050		0.183		0.121		0.119
Husband's education:											
Secondary					0.217***		0.225+		0.214+		0.218+
Higher					0.413***	-0.068		-0.090		-0.094	
Husband's occupation:											
Labor					-0.180*		-0.058		0.049		-0.070
Business					0.092		0.040		0.048		0.130
Has electricity at home					-0.132		-.169		0.151		-0.056
Has a radio					-0.028		0.117		0.089		0.062
Owns land					0.197**		-0.140		-0.156+		-0.157+
Non-Muslim					0.130		0.383**		0.390**		0.405**
Maternal age[b]							0.086+		0.078		0.086
Maternal age squared[b]							0.000		-.001		-0.000
Parity[b]							1.988***	1.983***	2.060***		
Parity squared[b]							-0.156***	0.156***	-0.161***		
Age at marriage[b]							-0.076***	-0.073***	-0.059***		

Table 3: Continued

FWA visited the woman in last 6 months									0.164+		0.077
Woman knows seven or more contraceptive methods									0.311**		0.215*
Division: Barisal Dhaka Khulna Rajshahi											 0.589** 0.428** 0.866** 0.833**
-2(Log L)	8094		8089.3		8089.3		8089.3		8038.3		8038.3

[a] See Table 2 for reference categories of independent variables; b: continuous variable; + P<0.10; *P<0.05;**P<0.01; and ***P<0.001

Table 4: Logistic Regression Coefficients of Factors Associated with Contraceptive Use (n=6,863

Independent variable	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6
Constant	-1.622***	-1.678***	-1.625***	-5.649***	-5.581***	-6.837***					
Talked with husband about family planning in last year: Once or Twice More often	 0.796*** 1.306***	 0.803*** 1.312***	 0.799*** 1.280***	 0.874*** 1.446***	 0.693*** 1.170***	 0.696*** 1.138***					
Couples ever discussed about family size	0.519***	0.500***	-0.484***	-0.582***	0.495***	0.505***					
Can woman go outside village: Can go alone Can go with a child	 0.377*** 0.238***	 0.357***	 0.339*** 0.233*	 0.207+	 0.198+ 0.221*		 0.141 0.071		 0.053		 0.026
Can woman go clinic/hospital: Can go alone Can go with a child	 0.313*** 0.336***	 0.313**	 0.256	 0.306**	 0.262*	 0.033	 0.043	 -0.015	 0.003	 0.048	 0.053
Work for income-earning			0.432***	0.447***	0.381***	0.337***	0.247***				
Member of NGO			0.212***	0.212***	0.088		0.017		-0.046		
Maternal education: Primary Above primary					 0.044 0.039		 0.176** 0.507***	 0.362**	 0.075	 0.387**	0.075

Table 4: Continued

Husband's education: Secondary Higher					0.079 0.125		0.035 -0.088		0.031 -0.107		0.028 -0.123
Husband's occupation: Labor Business					-0.294*** -0.126+	-0.275***	-0.248*** -0.159*	-0.103	-0.143*		-0.052
Has electricity at home Has a radio Owns land Non-Muslim					-0.014 -0.134* 0.055** 0.356***	0.367***	-0.046 0.216** -0.108+ 0.403***	0.407***	0.004 0.151* -0.156*		0.143 0.108 -0.156*
Maternal age[b] Maternal age squared[b] Parity[b] Parity squared[b] Age at marriage[b]							0.257*** -0.004*** 0.499*** -0.051*** -0.048***	0.227*** -0.003*** 0.452*** -0.048*** -0.048***	0.242*** -0.003*** 0.512*** -0.051*** -0.026*		
FWA visited the woman in last 6 months									0.798***	0.731***	
Woman knows seven or more contraceptive methods									0.630***	0.535***	
Division: Barisal Dhaka Khulna Rajshahi											0.650** 0.517** 1.080** 1.080**
-2(Log L)	8688.5		8635.5		8583.7		8041.7		7703.8		7519.3

a: See Table 2 for reference categories of independent variable; + P<0.10; *P<0.05;**P<0.01; and ***P<0.001

Table 5: Proportional Hazards Regression Coefficients of the Effects of Education and Socioeconomic Demographic Variables on Having a Subsequent Birth (n=33, 702)

Independent variable	Model 1	Model 2	Model 3
Birth year (re=60-74):			
75-84	-0.003	0.122***	0.155***
85-94	-0.189***	-002	0.029
Maternal education (rc=None & Primary):			
Secondary	0.008	0.008	0.008
Husband's education (rc=Secondary or below):			
High	-0.090***	-0.091***	0.090*
Interaction:			
High X 75-84			-0.201***
High X 85-94			-0.265***
Non-Muslim (rc=Muslim)	-0.0107***	-0.111***	-0.047
Interaction:			
Non-Muslim X 75-84			-0.111*
Non-Muslim X 85-94			-0.054
Maternal age	0.153***	0.156***	0.158***
Maternal age squared	-0.004***	-0.004***	-0.004***
Parity	-0.071***	-0.074***	-0.076***
Parity squared	0.010***	0.011***	0.011***
Division (rc=Chittagong):			
Barisal & Dhaka	-0.141***	-0.050	-0.047
Khulna	-0.280***	-0.084*	-0.083*
Rajshahi	-0.233***	-0.016	-0.015
Interaction:			
Barisal & Dhaka X 75-84		-0.090*	-0.095*
Barisal & Dhaka X 85 - 94		-0.148***	-0.150***
Khulna X 75-84		-0.221***	-0.222***
Khulna X 85-94		-0.321***	-0.322***
Rajshahi X 75-84		-0.235***	-0.238***
Rajshahi X 85-94		-0.346***	-0.349***
-2 (Log L)	254938.8	254905.5	254891.0

rc= reference category; + P<0.10; *P<0.05; **P<0.01; and ***P<0.001

Figure 1: Probability of having a birth in three years by calendar year

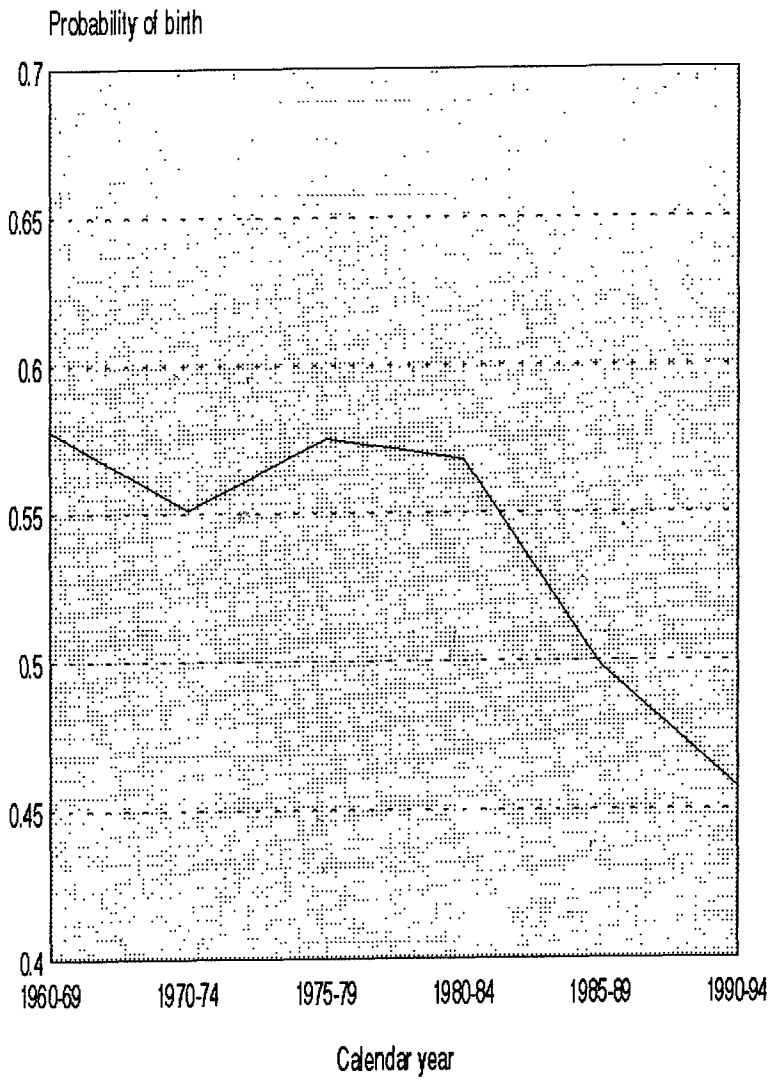
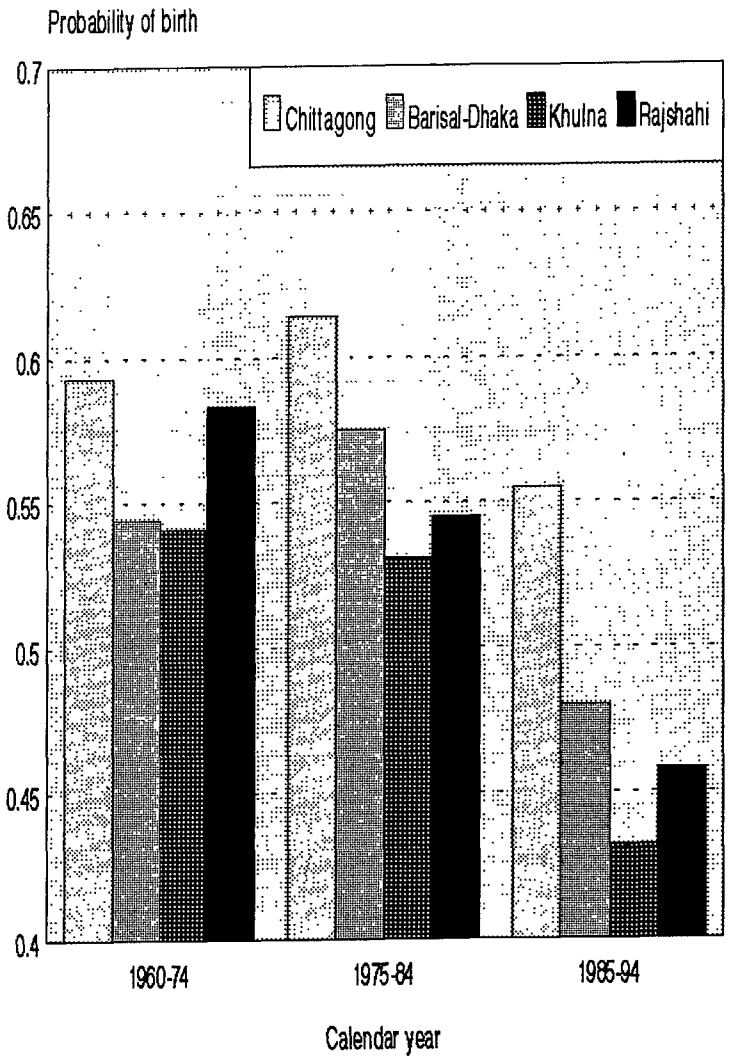


Figure 2: Probability of having a birth in three years by division and calendar year



Differences between Husbands and Wives in Attitudes toward Contraceptive Use and Fertility Preferences

M. Kabir, A.K. Ubaidur Rob, Kazi Saleh Ahmed, Unnati Rani Saha

Introduction

The analysis of 1983 CPS data confirmed that husbands are more likely to report the use of male methods than their wives. This prompted substitution of wife's response on current use of condoms and vasectomy by husband's response (CPS, 1989). It has been suggested that independent responses from husbands and wives on various aspects of contraceptive use would provide a validity check on the quality of data. Findings from the CPS suggest that women are more likely to provide correct information on the issues related to fertility and child health but not on the use of male contraceptive methods. The primary objective of this article is to analyze information obtained from husbands and wives in the 1993/94 Bangladesh Demographic Health Survey (BDHS), and to ascertain the differences in responses between husbands and wives. The analysis will provide an idea about the roles of husbands and wives in family planning and fertility decision making in a traditional society like Bangladesh. In the BDHS, a sub-sample of husbands of eligible women were interviewed in order to obtain insights into the role men played in fertility and family planning decision-making processes. A total of 3254 husbands were successfully interviewed.

Despite the overall success of the family planning program in Bangladesh, cultural and religious values create an important barrier for family planning practices. Most Bangladeshis are Muslim and hold traditional cultural values. Both Islamic and cultural traditions support the dominant role of the husband in decisions regarding family life. Thus, husband's approval plays an important role in the decision to practice contraception. The lack of information on husbands attitude reflects the fact that most family planning studies have focused on the wives motivation and contraceptive use. However, in many countries husbands play a deciding role in their wives acceptance of family planning methods. Approval by the husband has been identified as an important factor for better utilization of family planning services.

Characteristics of the Couples

In order to understand differences in the responses of husbands and wives on different aspects, it is essential to know the background characteristics of respondents in the BDHS. Findings from Table 1 suggest that about 85 percent of couples were from rural areas and a large portion among them were illiterate. Since a large majority of the couples came from rural areas, it is expected that they would have a traditional outlook on matters relating to family planing, desired family size and fertility preferences. Significant variations by division are also evident (Table 1). With regard to education, husbands were better educated than their wives. For instance, a little more than 58 percent of the wives had no education compared to 43 percent of the husbands. Among the wives, only 14.5 percent

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had secondary/higher education. The comparable figure for the husbands is almost double that of their wives. The mean years of schooling for wives is about one and a half years lower than that of the husbands.

It is observed that almost all the husbands are older than their wives. Over 55 percent of the wives were under 30 years of age while about 57 percent of husbands were under 40 years of age. The responses of husbands and wives in reporting the number of living children have been compared in Table 1. This information suggests a discrepancy in reporting numbers of living children between husbands and wives. Over 9 percent of husbands reported that they had no living children while 10 percent of wives reported the same. The difference in response seems to be higher for the couples who reported having one or two living children and five or more living children. The average number of living children reported by husbands is slightly higher than the number reported by wives.

Age differences between husband and wife suggest that more than half of the wives were younger (by less than 10 years) than their husbands. The mean age difference between husbands and wives was about 10 years (Table 2). About one among six wives was younger than her partner by more than 15 years, indicating prevalence of early marriage of females. Among the couples, about one third had no education. Approximately one in four of the husbands had some education while their wives had no education. Similarly, about 9 percent of wives had some education while their husbands had no education (Table 2). One would expect that these differences in the background characteristics between husbands and wives will affect the reproductive behavior of the couples.

Mobility of Women

Traditional practice demands that women should maintain *purdah*. It refers to the system of isolation of women from outsiders and the imposition of high standards of female modesty. It puts restriction on women's physical mobility. *Purdah* as well as restricted movement exclude women from direct participation in productive activities, particularly from work outside the homestead. In this study, both husbands and wives were asked questions on the status of women's mobility. A large discrepancy has been observed between the responses of husbands and wives regarding mobility of women. Findings presented in Table 3 suggest that approximately 29 percent of the husbands stated that their wives can go outside alone as opposed to 41 percent of women who replied positively. In addition, approximately 47 percent of the husbands mentioned that their wives can go outside their home with their children. In contrast, 37.5 percent of women suggested that they were permitted to go outside with their children. It is surprising to see that approximately one-fourth of the husbands suggested that they did not allow their wives to go outside alone. As expected, more husbands in the rural areas did not allow their wives to go outside. Similarly, regional differences across divisions are also apparent, with more wives from Chittagong and Barisal having higher restriction in their movement. Restricted mobility of women has serious implications for the exposure of rural women to new attitudes and beliefs and interest in planning their families.

Use of Contraception and Their Characteristics

Husbands and wives were questioned separately on the use of contraceptive methods. According to husband's responses, over 79 percent were ever users, while the comparative figure for wives was about 72 percent (Table 4). The difference between husband's and wive's responses was about 8 percent indicating, that husbands over reported or their wives understated ever use of contraceptive

methods. Similar inconsistency was also observed in the case of current use of contraceptive methods by both husbands and wives. About 57 percent of husbands reported current use as against about 50 percent among wives.

Differentials existed for methods of contraceptive use between husbands and wives by socioeconomic characteristics. Urban husbands were more likely to be users than their rural counterparts. Comparison of age and education suggests that large discrepancies prevailed in the age group 25-29 as well as for those who completed primary education. Similar differentials existed in the case of access to mass media, involvement with NGO activities, cash earning ability and place of work. Examination of the couple's education level revealed that the difference is least for the wives who had some education with illiterate husbands. The discrepancy is higher for the couples who both had some education. Among couples who had one or two living children, their response regarding family planning use revealed higher discrepancy than those who had two or more living children. This may be due to lower inter-spousal communication among the former group. Lower age differences among the spouses entails a higher discrepancy in their response regarding contraceptive use, thereby suggesting a communication gap between couples. In terms of knowledge of family planning methods, the discrepancy is almost double if the couples had no knowledge. There is little difference in the case of contraceptive use between the couples if they knew about at least one modern method. Again, the difference is high for the couples who knew about at least one traditional method.

The discrepancy between husbands and wives responses is large for couples who approved of family planning, while it is lowest for couples who jointly disapproved of family planning. The difference is lower in the case of wives who approved of family planning, while it is higher for the husbands who approved use. This analysis suggests significant lack of communication between husbands and wives.

Method-specific differences in the responses of husbands and wives have been also investigated. Findings are represented in Table 5. A close examination of information by selected background information suggests that modern methods such as pills, condoms and male sterilization are over reported by rural husbands, while IUD, injection and female sterilizations are over reported by rural wives. With the exception of pills, women tend to under report male methods while males do the reverse.

The same pattern of discrepancy exists for respondent characteristics such as age, education, access to mass media, age differences between the couples, education of the couples, number of living children and division of residence etc. Similarly, two other factors - persons who influenced to use family planning and mobility status - also showed differences in the use of contraceptives between husbands and wives. However, a close examination of the data suggests that there is no systematic association between the responses and the background characteristics of the couples.

Person Influenced to Adopt Family Planning

Both husbands and wives were separately asked to identify the person who had influenced them to use contraceptive methods. As can be seen in Table 6, roughly one among four husbands and about one third of the wives said that their husbands influenced them. Approximately 30.5 percent of husbands reported that they had more influence while about 21 percent of wives mentioned that they were most influential in their decision to use. 43.8 percent of husbands and 45 percent of wives mentioned that the husband and wife had equal influence.

Approval of Family Planning

Husband's approval of contraceptive use plays a decisive role in Bangladesh. Despite this fact, no previous study in Bangladesh has investigated the importance of husband's approval. Such investigation is especially important in rural Bangladesh, where family planning programs face many barriers. Couple's approval, and in particular husband's approval, is important in the acceptance of family planning.

As is evident from Table 7, about 93 percent of husbands and 95 percent of wives approved the use of family planning. Consistency between the responses of couples is high since more than 93 percent of the couples reported that they approved use of contraceptives. As expected, approval of contraception is low for both husbands and wives in Chittagong Division.

Family Size Preferences

In Bangladesh, traditionally parents desired large families since children were valued highly for their contribution in household activities. Infant and child mortality rates are relatively high and educational levels are very low, particularly for women. These circumstances are typically associated with low contraceptive use and high fertility. Studies in developing countries have shown evidence of association between contraceptive use and fertility preferences (Arnold, 1985; Nag, 1991). It is observed that a large proportion of women who did not desire additional children did not practice contraception. In the 1993-94 BDHS, both husbands and wives were asked about their desired fertility. Table 8 provides the percentage distribution of husbands and wives by their desire for additional children. As is evident from the findings, the percentage of husbands and wives who reported that they did not want more children is more or less consistent between husbands and wives (57.1 percent by husbands and 57.5 percent by wives). Similar patterns were found by urban-rural status and divisions of residence (Table 8).

The consistency in responses between husbands and wives was also noted for discussions about desired number of children. For instance, a little over 74 percent of husbands mentioned that they discussed fertility preferences with their wives. The comparable percentage reported by wives was over 78 percent (Table 9).

As expected, urban-rural differences in the discussion of desired number of children existed. Between the divisions, the discrepancy is large in Chittagong division. There are also variations by urban-rural status and division of residence in the stated ideal number of children. As expected, the ideal number of children expressed by wives living in the Chittagong region is higher than those of other divisions.

Couples were also asked to state their desired number of children. This information is presented in Table 10. There is a difference in the responses between husbands and wives regarding the number of children they want. For instance, 75 percent of husbands reported they want the same number of desired children as against 67 percent of wives. Only about 4 percent of husbands stated that they desired more children. The corresponding figure for wives is three times higher.

Preference for Ideal Number of Children

Both husband's and wife's opinions regarding ideal number of children were also investigated. As can be seen from Table 11, there appears to be no significant difference between husbands and wives

response on the number of ideal children. The most frequently stated ideal number of children as expressed by the couples was two; more than half of the husbands and wives preferred this number. Roughly one in four husbands and wives preferred three children. There is also evidence that husbands and wives from Chittagong Division desire more children than in other divisions (Table 11). The mean ideal number of children preferred by both husbands and wives was almost similar; namely, 2.5 children per couple.

Selected characteristics of both husbands and wives who reported that they do not want more children were also investigated (see Tables 12 and 13). Relatively fewer husbands and wives with no education wanted additional children in comparison to more educated couples. Although there is, in general, difference between husbands and wives who did not want more children by the level of education, relatively more wives expressed desire for no more additional children. For example, 89 percent husbands who had secondary/higher secondary education reported that they did not desire more children as against about 95 percent of the wives. There is a pronounced discrepancy in the percentages of husbands and wives who did not want additional children in Chittagong Division (Table 12).

The percentage distribution of husbands and wives who did not want additional children by number of living children is shown in Table 13. The difference in response between husbands and wives is of the order of 2 percentage points if the number of living children is lower. The difference is large if the number of living children increases. For instance, about 59 percent of husbands with five or more living children mentioned that they did not want more children. The comparable figure for wives was 64.9 percent.

The mean number of children desired by husbands is slightly higher than reported by wives. The mean number of children desired by husbands and wives is highest for Chittagong Division, while discrepancy in patterns of response are consistent across the divisions.

Consistency in Reporting the Use of Family Planning by Husbands and Wives

The consistency in reporting ever use and current use of family planning method is examined in this section. Findings from Table 14 suggest that approximately 84 percent of couples gave consistent responses about ever use of FP, 67 percent agreeing that they had used a method and about 17 percent agreeing that they have never used a method (Table 14). Thus the proportion of couples for which there is discrepancy between husband's and wife's responses is 16.5 percent (14.6 percent for modern methods and 35 percent for traditional methods).

The level of disagreement in responses regarding current use is also large. Overall, there is agreement about current use among 83.4 percent of all couples, with 45.2 percent saying that they are currently using and 38.2 percent reporting no current use (Table 15). In terms of method use, the major discrepancies were found among methods such as pills, condoms and male sterilization. It seems that husbands over stated use of pills, condoms and male sterilizations. There is a tendency among females to over report female methods while men over report male methods, with the exception of pill use. The past CPSs also indicated that females under reported male methods while males under reported female methods (CPS, 1991).

Attitudes About Family Planning

Husbands were asked about their approval of the use of family planning by couples and their perception about their wife's attitude regarding family planning. Similar information was collected in the women's questionnaire. These data are used to examine the accuracy of perceptions of both husbands and wives regarding their spouse's attitude towards family planning.

As is shown in Table 16, approximately 85 percent of wives believe that their husbands approve the use of family planning; 10 percent believe that their husband disapproves family planning and 5 percent are uncertain. Approximately 77 percent of the wives accurately predicted their husband's perceptions. In situations where the wife was wrong about the husband's attitude, half of the cases consisted of the wife believing that the husband disapproved or was unsure about the use of family planning when the husband actually approved.

Contraceptive Use Status of Couples Who Did Not Want Additional Children

It has been found that about 57 percent of husbands and wives reported that they did not want more children. In this section we want to assess whether they are using any method in order to avoid further pregnancy. Table 17 shows the percentage distribution of couples who did not want more children by their use status. Among the husbands who stated that they did not want more children, over 61 percent are currently using contraceptives. In the case of wives, the figure is 7 percent lower, indicating inconsistency between husbands and wives responses. Rural women are less likely to use contraceptives in relation to their urban counterparts. Similarly, current contraceptive use is low for husbands and wives of Chittagong division who did not desire more children.

Logistic Regression Analysis

To identify the factors affecting husband's and wife's desired fertility, contraceptive use and mobility of women, logistic regression analysis is employed. The three dependent variables are desire for additional children, current contraceptive use status and mobility of the wives. The independent variables are: whether visited by FP workers, listen to radio, watch television, education of the respondents, age of the respondents, total number of living children, discussed desired number of children, involved in non-government organization programs, earns cash money, discusses family planning, current use of family planning methods, place of residence and geographic division of residence.

Variables	Categories
Want additional children	0 = did not desired, 1 = desired additional children
Visited by FP workers during the last six months	0 = not visited during the last six months, 1 = visited during the last six months
Listened to radio	0 = does not listen to radio, 1 = listens to radio
Contraceptive use status	0 = not currently using, 1 = currently using
Watched television	0 = does not watch television, 1 = watch television
Education of the respondents	0 = no education, 1 = 1-5 years of education ,2 = 6-9 years of education, 3 = 10+ years of education

Variables	Categories
Age of the respondents	Continuous
Total number of living children	Continuous
Discussed desired number of children	0 = did not discuss, 1 = discussed
Allowed to go outside of the home	0 = did not allowed, 1 = allowed to go out
Discussed family planning	0=never discussed, 1=discussed
Place of residence	0=urban, 1=rural
Geographic division of residence	0=Rajshahi, 1=Barisal, 2=Khulna, 3=Dhaka, 4=Chittagong
Involved in NGO programs	0=not involved, 1=involved

Since there is a possibility of non-linear relationships between age and number of living children, we also included Age^2 and LCQ^2 (number of living children-LCQ) variables in the model. Three logistic regression models were considered using three different dependent variables. The first model considered desire for additional children, the second model considered current contraceptive use status, while the third model used mobility status as the dependent variable. The results of the three models are presented in Table 18.

Variables which have significant effects on the desire for additional children are age of the respondent, number of living children, place of residence, involvement of women in NGO programs, inter-spousal communication about family planning and geographic division of residence. The higher the age of the respondent the larger is the likelihood that their desire for additional children will be greater. The number of living children is also an important determinant of whether or not couples desired additional children.

Discussions between husbands and wives regarding family planning increased the likelihood of having fewer children. The relationship between number of living children and the desire for additional children may imply that fewer living children increase the likelihood of wanting additional births. Inter-spousal communication on family planning is also an important determinant of the desire for additional children.

Place of residence has a negative effect on desire for additional children. For example, women in rural areas are more likely to have more children than their urban counterparts. Analysis of regression coefficients for geographic divisions of residence demonstrate that there is regional variation in the desire for additional children. Women in Chittagong division want more additional children than women living elsewhere.

It is observed that education of the respondents, number of living children, radio listening, discussion about family planning, geographic area of residence and visits by family planning field-workers have significant impacts on current use of contraception. Similarly, current use of contraceptives, number of living children, place of residence, cash earning capacity of the women, geographic division of residence and discussion about the desired number of children have significant impacts on the mobility of women. The variables which have significant influence on desire for additional children

need special attention. For example, participation of women in NGO programs will give women more exposure to different aspects of social life. This might increase their ability to exchange views with their husbands on issues related to family planning and family formation.

Discussion and Conclusion

In this study, discrepancies between husbands' and wives' responses were investigated and the factors which influence these discrepancies were identified through logistic regression analysis. Detailed investigation suggests that differences in the number of living children is small while large variations exist in the use of contraceptive methods. For instance, about 57 percent of husbands reported current use as against 50 percent of wives. The major discrepancies were found among users of pills, condoms and vasectomies.

Discrepancies were also found by socioeconomic characteristics of the couples. Among couples who had no living children or had only one living child, differences were found among women who had two or more living children. This may be due to higher inter-spousal communication as marriage duration increases. Findings also suggests that the discrepancy between husband's and wife's response is larger in the case of couples who jointly approved of family planning, while discrepancy was lowest for the couples who jointly disapproved of family planning. Disagreement on discussion of family planning was large for the couples who were ever users while discrepancy for the couples who were current users was negligible. Discrepancy by place and division of residence was also evident, particularly among rural women and women from Chittagong Division.

Couples do not always agree among themselves about the number of children they desire. The information collected on family size preferences in Bangladesh suggests that men often report wanting more children than their wives do. Similar discrepancies were also found in the case of contraceptive use. For example, among the husbands who stated that they did not want additional children, over 61 percent were currently using contraceptives, while only 54 percent of wives were using.

Determinants of husband's and wife's desired fertility, contraceptive use status, and mobility status were identified through logistic regression analysis. The results suggest that significant variables which influenced desire for additional children were current age of the respondent, number of living children, involvement with NGO programs, place of residence, division of residence and inter-spousal communication on family planning matters. Similarly, current contraceptive use status was influenced by education, number of living children, radio listening, visits by the family planning field-worker, division of residence and inter-spousal communication on family planning.

This study also found that the family size preferences which women express do not purely reflect personal choice. They are often conditioned by predominant social values, and reflect deep seated social and cultural attitudes and expectations that are beyond the control of many women, especially younger women. In some settings husbands or extended family members have a greater say than the individual woman in sustaining these values. And in other settings, both men and women feel that child bearing is up to God. A more rapid transition to lower desired fertility and contraceptive use will likely occur when more women are able to directly control their decisions affecting procreation and reproductive health.

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Table 1: Percentage Distribution of Husband and Wife by Selected Background Characteristics

Characteristics	Husband	Wife
N	3254	3254
A. Place of Residence		
Urban	15.3	15.3
Rural	84.7	84.7
Total	100.0	100.0
B. Division		
Barisal	10.1	10.1
Chittagong	17.9	17.9
Dhaka	28.9	28.9
Khulna	14.0	14.0
Rajshahi	29.1	29.0
Total	100.0	100.0
C. Age		
<19	0.6	13.7
20-24	5.1	20.9
25-29	14.4	20.6
30-34	19.7	15.4
35-39	17.5	12.3
40-44	12.6	10.0
45-49	10.0	7.1
50-54	8.2	-
55+	11.9	-
Total	100.0	100.0
Mean	39.2	29.5
D. Education		
No education	43.1	58.1
Incomplete primary	21.7	17.1
Complete primary	7.6	10.3
Secondary/higher	27.6	14.5
Total	100.0	100.0
Mean (in years)	3.6	2.2
E. Number of living children		
Zero	9.2	10.0
One	15.5	17.0
Two	19.3	20.9
Three	18.1	18.2
Four	12.6	12.4
Five and Above	25.3	21.5
Total	100.0	100.0
Mean	3.23	3.20

Table 2: Percentage Distribution of Couples by Educational Level and Age Differences

Category	Percent
N	3254
A. Level of Education	
Both husband and wife had no education	34.4
Husband had some but wife had no education	23.7
Husband had no education but wife had some education	8.7
Both had some education	33.2
Total	100.0
B. Age difference between husband and wife	
0-4	15.5
5-9	40.6
10-14	28.4
15 and above	15.5
Total	100.0
Mean age difference	9.7

Table 3: Percentage Distribution of Husbands and Wives According to Whether Wives Allowed to Go Out Alone

Area		Can go alone	Can go with children	Not allowed to go out	Others	Total	N
National	Husband	28.6	46.9	21.7	2.8	100.0	3254
	Wife	40.9	37.5	18.2	3.4	100.0	3254
Urban	Husband	43.0	35.5	18.9	2.6	100.0	498
	Wife	54.2	31.3	10.8	3.6	100.0	498
Rural	Husband	26.0	48.9	22.3	2.8	100.0	2756
	Wife	38.5	38.6	19.5	3.4	100.0	2756
Division							
Barisal	Husband	14.8	55.8	23.9	5.5	100.0	330
	Wife	33.0	47.0	14.8	5.2	100.0	330
Chittagong	Husband	25.4	47.7	14.8	5.2	100.0	583
	Wife	34.3	42.0	21.8	1.9	100.0	583
Dhaka	Husband	33.0	42.0	21.7	3.3	100.0	941
	Wife	44.7	33.2	18.5	3.6	100.0	941
Khulna	Husband	35.9	44.9	17.6	1.5	100.0	454
	Wife	35.9	44.9	17.6	1.5	100.0	454
Rajshahi	Husband	27.4	49.2	22.1	1.4	100.0	946
	Wife	43.4	37.1	16.4	3.1	100.0	946

Table 4: Contraceptive Users by Background Characteristics of Husbands and Wives

Background Characteristics of Wives	Current User		Ever User	
	Husband	Wife	Husband	Wife
A. National	56.7	50.3	79.4	71.8
B. Place of Residence				
Urban	64.1	57.4	87.1	82.9
Rural	55.3	49.1	78.0	69.8
C. Division				
Barisal	59.4	53.6	84.5	78.2
Chittagong	43.2	36.5	64.5	55.6
Dhaka	53.0	45.7	78.9	70.5
Khulna	66.5	61.0	86.1	79.3
Rajshahi	62.9	57.2	84.1	77.3
D. Age				
15-19	39.5	31.3	63.0	50.8
20-24	54.2	44.8	79.4	71.1
25-29	61.4	54.9	85.2	79.3
30-34	69.5	63.9	88.6	83.4
35-39	66.5	61.8	86.8	80.8
40-44	56.3	56.9	76.8	71.6
45-49	40.7	33.3	68.0	54.5
E. Education				
No education	52.2	46.0	74.4	65.5
Incomplete primary	57.5	50.4	81.7	75.1
Complete primary	61.1	53.3	87.1	79.6
Secondary and above	70.4	65.5	91.3	87.7
F. Access to Mass Media				
None	51.9	44.8	75.0	65.6
One	60.5	54.2	82.5	76.2
More than one	67.3	63.6	89.8	86.6
G. Involved with NGO Activities				
No	55.2	48.9	77.6	69.9
Yes	62.6	56.9	86.4	79.6
H. Mobility Status				
Yes, alone	62.4	57.6	83.8	78.2
With child	56.7	50.5	79.8	72.8
Not allowed	44.3	35.4	68.9	56.7

Table 4: Continued

Background Characteristics of Wives	Current User		Ever User	
	Husband	Wife	Husband	Wife
I. Earns Cash Money				
Yes	63.9	59.2	83.2	78.8
No	55.5	48.9	78.8	70.6
J. Couple's Education				
Both uneducated	50.8	45.3	72.9	64.6
Husband some and wife none	54.3	47.2	76.5	66.9
Wife some and husband none	51.1	48.6	76.2	70.6
Both some	65.9	58.3	89.0	83.1
K. Number of Living Children				
None	22.3	15.6	45.6	30.9
One	50.7	41.5	78.2	67.7
Two	65.3.	57.5	86.3	80.1
Three	67.3	61.3	87.5	81.4
Four	68.0	61.0	86.6	78.4
Five and above	53.5	51.2	78.4	74.1
L. Knowledge of FP Methods				
None	0.0	0.0	0.0	0.0
At least one modern method	39.7	59.7	59.7	60.8
At least one traditional method	83.7	46.6	85.3	80.4
M. Approve FP				
Both approve	64.9	58.4	83.0	75.5
Both disapprove	10.8	12.3	24.4	12.2
Husband approve	43.1	25.4	82.1	73.8
Wife approve	28.6	33.0	80.9	74.2
N. Wife's Place of Work				
Home	60.3	55.7	81.9	77.6
Outside home	69.7	49.7	86.2	71.1
O. Age difference Between Husband and Wife				
0 -4	54.9	46.7	81.9	70.4
5 -9	59.3	53.1	80.2	74.6
10-14	56.7	50.0	79.2	71.3
15 +	51.5	47.3	75.0	66.6

Table 5: Contraceptive Prevalence of Husbands and Wives by Background Characteristics and Type of Method Used

Background Characteristics of Wives	Pill		IUD		Injection		Condom		Female sterilization		Male sterilization		Safe period		Withdrawal		Other	
	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W
National	23.7	19.5	1.9	2.2	4.6	4.9	4.4	3.3	8.7	8.9	2.2	1.4	7.7	5.9	2.2	3.1	1.3	1.2
Place of Residence																		
Urban	26.9	22.5	2.4	2.0	5.0	4.6	9.6	8.2	7.2	7.4	1.4	1.0	8.2	6.8	2.4	4.0	O.8	0.8
Rural	23.1	18.9	1.8	2.2	4.5	4.9	3.4	2.4	9.0	9.1	2.4	1.5	7.6	5.7	2.2	2.9	1.3	1.3
Division																		
Barisal	24.2	22.4	1.8	2.4	6.7	5.8	3.9	2.7	9.7	10.3	2.4	1.2	4.8	6.4	3.9	1.8	1.8	0.6
Chittagong	16.1	12.0	1.9	2.7	4.1	4.3	2.9	2.7	6.2	5.8	0.7	0.3	7.7	4.3	1.9	2.4	1.7	1.9
Dhaka	21.9	17.9	1.8	1.9	4.4	4.8	4.7	2.8	8.1	8.5	1.7	0.6	8.4	5.5	0.9	2.6	1.3	1.2
Khulna	23.1	19.6	3.1	3.7	6.2	6.4	6.4	5.5	9.5	8.8	1.8	1.1	9.9	7.7	5.5	6.8	1.1	1.3
Rajshahi	30.2	24.6	1.5	1.4	3.6	4.2	4.1	3.4	10.3	10.7	3.8	3.1	7.0	6.1	1.6	2.6	0.8	1.1
Age																		
10-14	17.4	8.7	0.0	0.0	0.0	2.2	6.5	6.5	0.0	0.0	0.0	0.0	6.5	2.2	2.2	4.3	0.0	0.0
15-19	22.5	17.8	1.0	1.5	2.3	1.8	3.8	3.3	0.0	0.0	0.0	0.0	7.5	4.8	2.3	2.0	0.3	0.3
20-24	27.6	23.8	1.9	2.1	5.3	5.3	6.2	3.8	2.2	2.5	1.3	0.1	7.5	4.4	1.5	1.9	0.7	0.9
25-29	30.8	25.7	2.8	3.1	5.8	6.4	5.2	3.1	6.9	7.2	1.6	1.0	5.5	4.2	2.1	3.4	0.4	0.6
30-34	25.5	22.0	1.8	2.4	6.0	6.0	3.8	3.8	12.8	12.8	4.4	3.6	9.4	6.6	3.0	4.6	2.8	2.2
35-39	21.8	14.8	3.3	3.3	5.0	5.5	4.0	4.3	17.5	18.8	2.8	2.0	8.3	7.3	2.8	4.0	1.3	2.0
40-44	15.0	13.8	1.2	1.8	2.8	4.6	3.1	1.5	16.5	15.9	3.1	2.1	10.7	11.6	1.5	4.0	2.4	1.5
45-49	6.5	4.8	0.0	0.0	2.6	1.7	0.9	1.7	15.2	14.3	3.9	2.2	6.5	5.6	3.0	0.9	2.2	2.2
Education																		
No education	19.8	16.1	1.2	1.7	4.6	4.9	2.2	1.4	11.8	11.9	2.7	1.8	7.1	4.7	1.3	1.8	1.5	1.5
Incomplete primary	26.5	21.3	2.5	2.9	5.4	5.4	4.1	3.4	6.5	6.8	1.8	1.1	8.1	5.7	2.0	3.0	0.7	0.7
Complete primary	30.8	24.6	2.7	2.4	3.3	3.9	6.3	4.2	2.7	2.7	1.5	0.6	9.3	7.2	3.3	6.6	1.2	1.2
Secondary/higher	31.1	27.2	3.4	3.2	4.5	4.7	12.1	10.4	3.2	3.4	1.3	0.6	8.5	9.8	5.3	5.5	1.1	0.6
Access to Mass Media																		
None	21.1	16.8	1.4	1.7	4.0	4.7	2.5	1.8	9.6	9.8	2.4	1.6	7.5	4.4	2.0	2.4	1.4	1.5
Only one	26.2	21.9	2.2	2.7	5.8	5.4	5.1	3.0	8.1	8.2	1.9	1.2	7.8	6.8	2.1	3.9	1.3	1.0
More than one	28.7	24.7	3.4	3.2	4.3	4.3	9.8	9.8	6.8	6.6	1.9	1.1	8.3	9.6	3.4	3.8	0.4	0.6
Involve with NGO Activities																		
Yes	23.2	19.4	2.0	2.3	4.0	4.3	4.4	3.6	8.4	8.5	2.2	1.3	7.6	5.6	2.2	2.9	1.3	1.1
No	25.7	19.8	1.6	1.9	7.0	7.0	4.1	2.3	10.1	10.5	2.3	1.9	8.1	7.0	2.3	3.9	1.2	1.7

Background Characteristics of Wives	Pill		IUD		Injection		Condom		Female sterilization		Male sterilization		Safe period		Withdrawal		Other	
	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W
Age difference																		
0 to 4	24.9	20.5	1.8	2.0	4.2	4.6	3.8	2.6	7.8	7.6	3.4	2.0	5.4	4.0	1.6	1.8	2.2	1.8
5 to 9	26.7	22.7	2.0	2.1	5.4	5.4	4.3	3.6	8.4	8.8	1.6	1.0	7.9	5.4	1.9	3.2	1.1	0.8
10 to 14	22.7	18.1	1.7	2.2	4.7	5.2	5.2	3.8	8.0	7.7	1.9	1.4	8.8	7.5	2.7	3.0	1.0	1.2
15 and above	16.3	12.5	2.2	2.8	2.8	3.0	3.6	2.4	11.9	12.5	3.2	2.0	7.6	6.2	2.8	4.2	1.2	1.8
Number of Living Children																		
Zero	8.9	5.2	0.0	0.0	0.6	0.3	4.3	3.4	0.9	0.9	0.9	0.6	4.9	3.4	1.8	1.8	0.0	0.0
One	26.4	22.7	1.4	2.0	2.7	3.1	5.2	3.1	2.9	3.2	1.4	0.7	8.1	4.0	1.8	2.5	0.7	0.2
Two	30.1	25.1	2.5	2.9	6.0	5.7	5.6	4.4	7.2	7.2	2.9	2.1	7.9	6.0	2.2	3.1	0.7	0.9
Three	25.9	21.8	3.9	3.9	5.4	6.3	5.1	4.2	12.4	12.4	1.7	1.2	9.6	6.1	2.9	4.6	0.5	0.8
Four	24.1	18.6	1.5	2.0	5.7	6.9	4.2	3.2	17.1	17.6	2.7	2.0	9.7	5.7	1.5	3.7	1.5	1.2
Five and above	20.2	16.6	1.1	1.4	5.2	5.2	2.0	1.7	10.6	10.7	2.9	1.6	5.7	8.3	2.6	2.4	3.3	3.3
Influenced to Adopt Family Planning																		
Wife influenced more	31.5	27.3	4.1	4.5	6.8	9.0	3.6	2.9	13.2	13.5	0.8	0.3	5.6	5.3	1.8	0.0	0.5	0.0
Husband influenced more	29.2	27.0	1.8	2.2	4.9	6.1	8.5	8.1	10.8	11.5	8.1	7.4	6.1	4.0	1.8	0.0	1.1	0.0
Both equal	37.2	33.4	2.6	3.0	6.2	6.6	6.1	5.5	13.2	13.8	2.0	0.9	6.6	9.1	0.7	0.0	0.4	0.0
Mobility status																		
Yes, alone	25.6	21.5	2.2	2.6	4.4	4.9	5.3	4.2	10.4	10.7	2.6	1.8	8.6	6.8	2.2	3.8	1.1	1.4
Yes, with child	23.0	19.1	2.0	2.0	5.4	5.7	3.5	2.8	9.4	9.6	2.6	1.6	7.1	5.7	2.3	2.8	1.4	1.1
Not allowed	20.6	14.9	1.2	1.5	3.2	3.2	4.2	2.5	4.6	4.4	0.8	0.5	6.4	4.9	2.2	2.4	1.0	1.0

Table 6: Percentage Distribution of Husbands and Wives According to Family Planning Decision-making

Area		Husband had more influence	Wife had more influence	Both had more influence	Others had influence	Total	N
National	Husband	23.5	30.5	43.8	2.2	100.0	2429
	Wife	31.1	20.8	45.0	3.2	100.0	2144
Urban	Husband	26.0	26.5	45.0	2.5	100.0	408
	Wife	19.0	32.8	45.2	3.0	100.0	372
Rural	Husband	23.0	31.3	43.5	2.2	100.0	2021
	Wife	21.1	30.7	44.9	3.3	100.0	1772
Division							
Barisal	Husband	22.6	29.8	41.1	6.4	100.0	265
	Wife	35.6	22.7	40.5	1.2	100.0	247
Chittagong	Husband	21.9	36.5	37.9	3.7	100.0	356
	Wife	38.3	21.8	34.9	5.0	100.0	298
Dhaka	Husband	24.9	31.0	43.1	1.0	100.0	703
	Wife	31.3	21.1	43.5	4.1	100.0	611
Khulna	Husband	17.6	26.6	55.8	0.0	100.0	346
	Wife	31.6	17.7	47.4	3.2	100.0	310
Rajshahi	Husband	26.1	29.1	42.6	2.2	100.0	759
	Wife	25.8	20.6	51.2	2.4	100.0	678

Table 7: Percentage Distribution of Husbands and Wives According to Family Planning Approval Status

Area		Approve use of family planning	Disapprove use of family planning	Total	N
National	Husband	93.0	7.0	100.0	3254
	Wife	95.4	4.6	100.0	3254
Urban	Husband	96.4	3.6	100.0	497
	Wife	97.8	2.2	100.0	497
Rural	Husband	92.4	7.6	100.0	2753
	Wife	95.0	5.0	100.0	2752
Division					
Barisal	Husband	96.1	3.9	100.0	330
	Wife	96.1	3.9	100.0	330
Chittagong	Husband	85.9	14.1	100.0	582
	Wife	89.5	10.5	100.0	583
Dhaka	Husband	93.4	6.6	100.0	940
	Wife	96.1	3.9	100.0	939
Khulna	Husband	92.9	7.1	100.0	453
	Wife	96.9	3.1	100.0	453
Rajshahi	Husband	95.9	4.1	100.0	945
	Wife	97.6	2.4	100.0	944

Table 8: Percentage Distribution of Husbands and Wives by Desire for Additional Children

Area		Want another child	Do not Want another child	Cannot get pregnant	Don't know	Total	N
National	Husband	37.0	57.1	3.0	2.9	100.0	2896
	Wife	37.0	57.5	3.8	1.7	100.0	2017
Urban	Husband	32.6	61.5	2.4	3.5	100.0	454
	Wife	34.0	62.3	2.2	1.5	100.0	456
Rural	Husband	37.8	56.3	3.1	2.8	100.0	2442
	Wife	37.5	56.6	4.1	1.9	100.0	2461
Division							
Barisal	Husband	39.0	57.6	2.4	1.0	100.0	290
	Wife	36.0	60.3	3.1	0.7	100.0	292
Chittagong	Husband	37.8	54.1	4.2	3.9	100.0	543
	Wife	35.2	56.4	5.7	2.7	100.0	546
Dhaka	Husband	36.2	57.0	3.4	3.3	100.0	847
	Wife	37.3	57.5	3.7	1.4	100.0	855
Khulna	Husband	34.2	59.6	2.5	3.7	100.0	403
	Wife	38.0	56.1	4.9	1.0	100.0	408
Rajshahi	Husband	37.9	57.9	2.1	2.1	100.0	813
	Wife	37.6	57.7	2.2	2.5	100.0	816

Table 9: Distribution of Husbands and Wives by Discussion Status on Desired Number of Children

Area		Discusses about number of children	Do not discuss about number of children	Total	N
National	Husband	74.1	25.9	100.0	3254
	Wife	78.2	21.8	100.0	3254
Urban	Husband	81.3	18.7	100.0	498
	Wife	84.3	15.7	100.0	498
Rural	Husband	72.8	27.2	100.0	2756
	Wife	77.1	22.9	100.0	2755
Division					
Barisal	Husband	72.4	27.6	100.0	330
	Wife	75.5	24.5	100.0	330
Chittagong	Husband	60.2	39.8	100.0	583
	Wife	70.7	29.3	100.0	583
Dhaka	Husband	76.5	23.5	100.0	941
	Wife	80.4	19.6	100.0	941
Khulna	Husband	76.2	23.8	100.0	454
	Wife	75.6	24.4	100.0	454
Rajshahi	Husband	79.9	20.1	100.0	946
	Wife	83.0	17.0	100.0	945

Table 10: Percentage Distribution of Husbands and Wives by Number of Additional Children Desired

Area		Desires same number of children	Desires more children	Desires fewer children	Don't Know	Total	N
National	Husband	75.1	3.5	10.0	11.4	100.0	3254
	Wife	66.7	11.1	7.4	14.8	100.0	3254
Urban	Husband	83.1	3.2	8.0	5.6	100.0	498
	Wife	75.1	9.6	6.8	8.4	100.0	498
Rural	Husband	73.7	3.6	10.3	12.5	100.0	2756
	Wife	65.2	11.4	7.5	15.9	100.0	2756
Division							
Barisal	Husband	78.1	2.4	10.0	8.5	100.0	330
	Wife	68.8	9.1	9.4	12.7	100.0	330
Chittagong	Husband	64.7	2.2	10.1	23.1	100.0	583
	Wife	56.3	15.6	6.3	21.8	100.0	583
Dhaka	Husband	78.5	3.2	8.3	10.0	100.0	941
	Wife	65.4	14.1	7.9	12.6	100.0	941
Khulna	Husband	76.2	4.0	10.1	9.7	100.0	454
	Wife	69.2	8.8	5.5	16.5	100.0	454
Rajshahi	Husband	76.2	4.9	11.3	7.6	100.0	946
	Wife	72.5	7.2	7.8	12.5	100.0	946

Table 11: Percentage Distribution of Husbands and Wives by Desired Number of Ideal Children

Area		One	Two	Three	Four and above	Others	Total	N
National	Husband	2.7	54.6	25.3	8.7	8.7	100.0	3249
	Wife	1.8	57.0	24.9	10.8	5.5	100.0	3250
Urban	Husband	5.1	64.2	17.6	7.7	5.5	100.0	495
	Wife	3.8	65.4	19.3	8.7	2.8	100.0	497
Rural	Husband	2.3	53.0	26.8	8.7	9.2	100.0	2748
	Wife	1.5	55.5	25.9	11.3	5.9	100.0	2752
Division								
Barisal	Husband	4.2	55.8	25.5	7.6	7.0	100.0	330
	Wife	1.8	58.4	26.4	10.3	3.0	100.0	329
Chittagong	Husband	1.5	39.0	26.4	10.3	18.6	100.0	582
	Wife	0.9	37.9	28.2	14.1	11.9	100.0	581
Dhaka	Husband	2.5	56.7	25.9	7.3	7.7	100.0	935
	Wife	2.0	56.0	27.6	9.6	4.8	100.0	941
Khulna	Husband	4.2	64.8	19.2	6.8	5.1	100.0	454
	Wife	2.2	68.5	18.1	7.5	3.7	100.0	454
Rajshahi	Husband	2.4	57.2	27.0	7.5	5.8	100.0	942
	Wife	2.0	63.7	22.9	7.7	3.7	100.0	944

Table 12: Percentage of Husbands and Wives Who did not Want Additional Children and Discussed Family Planning by Education Level

Area		No education	Incomplete primary	Complete primary	Secondary/Higher
National	Husband	68.6	71.2	74.5	89.1
	Wife	73.3	81.0	87.4	94.5
Urban	Husband	69.4	79.2	81.3	85.4
	Wife	69.8	90.2	69.0	88.9
Rural	Husband	67.9	71.8	82.0	85.9
	Wife	70.7	84.0	83.2	93.8
Division					
Barisal	Husband	60.0	75.0	75.0	88.1
	Wife	64.9	82.9	94.9	94.1
Chittagong	Husband	51.3	60.7	70.3	91.2
	Wife	65.6	84.2	77.8	97.1
Dhaka	Husband	68.8	73.0	92.9	82.1
	Wife	70.2	82.2	82.7	89.4
Khulna	Husband	72.7	72.0	84.0	81.8
	Wife	70.6	79.6	68.0	94.4
Rajshahi	Husband	77.2	81.6	82.8	88.0
	Wife	76.0	90.8	76.6	87.2

Table 13: Percentage of Husbands and Wives Who did not Want Additional Children and Discussed Family Planning by Ideal Number of Children

Area		One	Two	Three	Four	Five and above	Mean no. of living children
National	Husband	88.1	93.1	87.1	73.7	58.5	3.9
	Wife	87.4	89.6	87.0	79.8	64.9	3.7
Urban	Husband	88.9	89.9	79.8	80.3	67.1	3.5
	Wife	84.2	85.2	85.7	77.5	64.4	3.1
Rural	Husband	76.3	85.5	77.4	74.0	67.3	4.0
	Wife	80.9	85.4	79.8	80.3	67.1	3.8
Division							
Barisal	Husband	77.8	80.6	77.3	80.8	70.8	4.0
	Wife	90.9	94.1	80.0	96.2	67.8	3.6
Chittagong	Husband	44.4	77.3	66.7	61.9	63.1	4.5
	Wife	77.8	85.4	77.4	77.3	63.4	4.2
Dhaka	Husband	85.7	86.2	73.9	79.5	68.1	3.8
	Wife	87.5	81.1	80.4	77.9	66.7	3.6
Khulna	Husband	76.9	86.0	83.0	80.6	62.7	3.6
	Wife	84.6	87.3	78.2	67.7	65.2	3.4
Rajshahi	Husband	88.0	92.6	84.3	80.3	71.7	3.7
	Wife	73.3	85.5	84.6	84.1	70.8	3.5

Table 14: Percent Distribution of Couples by Husband's and Wife's Reported Who Reported Ever Use of Family Planning Methods

Method	Reported ever use of family planning					Total
	Both used	Husband only used	Wife only used	Total inconsistency	Both never used	
Any Method	67.3	12.0	4.5	16.5	6.2	100.0
Any Modern Method	59.9	10.2	4.4	14.6	25.5	100.0
Pill	43.3	12.5	5.0	17.0	39.2	100.0
IUD	6.0	1.8	2.4	4.2	89.8	100.0
Injection	9.5	3.3	3.3	6.6	83.9	100.0
Condom	12.6	16.6	4.0	20.6	66.8	100.0
Female Sterilization	8.6	0.7	0.0	0.7	90.7	100.0
Male Sterilization	1.5	0.7	0.0	0.7	97.8	100.0
Any Traditional Method	17.1	24.0	11.0	35.0	47.9	100.0
Periodic Abstinence	10.4	25.0	0.0	25.0	64.6	100.0
Withdrawal	4.4	9.4	0.0	9.4	86.2	100.0
Other	1.1	2.0	0.0	2.0	96.9	100.0

Table 15: Percent Distribution of Couples by Husband's and Wife's Reported Current Use of Family Planning Methods

Method	Current use of family planning					Total
	Both used	Husband only used	Wife only used	Total inconsistency	Both not using	
Any Method	45.2	11.4	5.1	16.5	38.2	100.0
Any Modern Method	37.3	8.2	2.9	11.1	51.6	100.0
Pill	17.8	5.9	1.7	7.6	74.6	100.0
IUD	1.7	0.2	0.5	0.7	97.6	100.0
Injection	3.7	0.8	1.1	1.9	94.3	100.0
Condom	2.6	1.7	0.8	2.5	94.9	100.0
Female Sterilization	8.3	0.4	0.6	1.0	90.7	100.0
Male Sterilization	1.3	0.9	0.1	1.0	97.7	100.0
Any Traditional Method	5.1	6.1	5.1	11.2	83.7	100.0
Periodic Abstinence	2.3	5.4	3.6	9.0	88.7	100.0
Withdrawal	0.9	1.3	2.2	3.5	95.6	100.0
Other	0.6	0.7	0.7	1.4	98.0	100.0

Table 16: Percent Distribution of Couples by Wife's and Husband's Perception of Husband's and Wife's Approval or Disapproval of Family Planning and Husband's and Wife's Actual Attitude

Wife's perception & Husband's attitude	Percent	Husband's perception & Wife attitude	Percent
Wife: Husband approves	84.70	**Husband: Wife approves**	87.53
Husband approves	76.64	Wife approves	76.65
Husband disapproves	2.80	Wife disapproves	6.42
Husband unsure/Don't know	5.26	Wife unsure/Don't know	4.46
Wife: Husband disapproves	9.71	**Husband: Wife disapproves**	5.19
Husband approves	6.42	Wife approves	2.79
Husband disapproves	2.00	Wife disapproves	2.00
Husband unsure/Don't know	1.29	Wife unsure/Don't know	0.40
Wife: Husband unsure	5.59	**Husband: Wife unsure**	7.28
Husband approves	4.46	Wife approves	5.26
Husband disapproves	0.40	Wife disapproves	1.29
Husband unsure/Don't know	0.73	Wife unsure/Don't know	0.73
TOTAL	**100.0**	**TOTAL**	**100.0**
Number of Couples	**3254**	**Number of Couples**	**3254**

Table 17: Percent Distribution of Husband and Wives Who did not Desire Additional Children by their Current Contraceptive Use Status

Area		Currently using contraceptives	Not currently using contraceptives	Total	N
National	Husband	61.4	38.6	100.0	1655
	Wife	54.4	45.6	100.0	1776
Urban	Husband	67.6	32.4	100.0	284
	Wife	63.7	36.3	100.0	284
Rural	Husband	57.2	42.8	100.0	1392
	Wife	52.4	47.6	100.0	1392
Division					
Barisal	Husband	59.1	40.9	100.0	176
	Wife	53.4	46.6	100.0	176
Chittagong	Husband	48.1	51.9	100.0	308
	Wife	41.9	58.1	100.0	308
Dhaka	Husband	58.1	41.9	100.0	492
	Wife	53.0	47.0	100.0	492
Khulna	Husband	67.7	32.3	100.0	229
	Wife	68.1	31.9	100.0	229
Rajshahi	Husband	62.6	37.4	100.0	471
	Wife	57.5	42.5	100.0	471

Table 18: Logistic Regression Analysis (Dependent Variable Desire for Additional Child)

Variables	Dependent Variable					
	Desire for Additional Children		Current Contraceptive Status		Mobility Status	
	ß-coefficient	Significant Level	ß-coefficient	Significant Level	ß-coefficient	Significant Level
Age	-	-	0.0049	0.9100	0.1804	0.0000
Age^2	0.0019	0.000	-0.0001	0.84155	-0.0022	0.0007
Level of Education						
No education	-	-	-	-	-	-
1-5 years education	0.1754	0.2882	0.0672	0.5817	0.0697	0.6033
5-9 years education	-0.0149	0.9404	0.3775	0.0094	0.0703	0.6725
10+ years education	0.0373	0.8384	0.9975	0.0000	0.3922	0.0244
Current use of contraceptives	0.1186	0.3648	-	-	0.3118	0.0041
Number of living children (LCQ)	2.0309	0.000	0.6434	0.0000	0.2731	0.0003
LCQ^2	-0.1647	0.000	-0.0583	0.0000	-0.0331	0.0010
Listens to radio	0.1684	0.1916	0.2473	0.0099	-0.05566	0.5936
Watches television	0.1682	0.3551	0.2094	0.1315	0.1781	0.2852
Place of residence						
Urban	-	-	-	-	-	-
Rural	-0.4913	0.0068	0.0243	0.8619	0.5195	0.0026
Earns cash money	-0.1916	0.2594	0.0805	0.5345	0.5056	0.0016
Involved in NGO Activities	0.2967	0.0436	-0.0645	0.5639	0.1479	0.2578
Discusses about FP	0.7101	0.000	1.2307	0.0000	-	-
Division of residence						
Rajshahi	-	-	-	-	-	-
Barisal	-0.2430	0.2683	-0.3015	0.0638	0.0764	0.6878
Khulna	-0.1923	0.3116	0.3116	0.0325	-0.2118	0.1813
Dhaka	-0.3591	0.2117	-0.3800	0.0013	-0.2004	0.1236
Chittagong	-0.6800	0.0003	-0.7009	0.0000	-0.2947	0.0426
Mobility status	0.2538	0.1021	0.1801	0.1344	-	-
Desire for additional children	-	-	0.1302	0.3068	-	-
Visited by the worker	-0.0517	0.6839	1.1730	0.0000	-0.0557	0.6049
Discusses about the number of children	-	-	-	-	0.6337	0.0000
Constant	-4.7058	0.0000	-3.1133	0.0000	-2.1978	0.0002
- 2 log likelihood X^2	1867.939, P<0.000		3017.139, P<.000		2782.276, P<.000	