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Biological and Behavioural Determinants of Fertility in Bangladesh: 1975-1989

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Women will readily accept contraception if services are made available in a culturally appropriate manner

Bangladesh, with an estimated total population of 115 million, is one of the most densely populated countries in the world. Further, despite recent fertility reductions, its annual population growth rate is about 2.17 per cent. Studies conducted in the early 1960s indicate a total fertility rate (TFR) of 7 children per woman (Afzal, 1967; Alauddin and Faruqee, 1983). Such high fertility is declining but, according to the report of the latest Bangladesh Fertility Survey (BFS) conducted in 1989, TFR was 5 (Huq and Cleland, 1990), which is still quite high by any standard. Thus, the fertility conditions prevailing in the country should legitimately be the core concern of national policies and programmes.

There have been numerous studies on fertility in Bangladesh, but still little is known about the precise nature of the determinants of fertility. In view of the high rate of population growth vis-a-vis the country's persistently high fertility, a study of the factors contributing to this phenomenon assumes great importance for bringing out the policy implications.

In this study, we examine factors affecting fertility using the most recent information from the 1989 BFS. Bongaarts' proximate determinants model has been applied to quantify the fertility-inhibiting effects of the important determinants of fertility. To study the trends in these effects of the principal proximate determinants and the changes in fertility levels, we applied the model to data obtained from two nationwide fertility surveys, one conducted in 1975 and the other in 1989. An attempt has also been made to arrive at a reasonable estimate of the level of fertility. The change in fertility during the period 1975-1989 has been decomposed into its constituents to assess their relative contributions.

Data

This study utilizes data extracted from the 1989 Bangladesh Fertility Survey (BFS), which was conducted on behalf of the Government of Bangladesh by the National Institute of Population Research and Training (NIPORT) with funding from the World Bank. Data from the 1975 Bangladesh Fertility Survey, conducted as a part of the World Fertility Survey in the 1970s (BFS, 1978), are also used to fulfill the objectives of the study. A total of 11,906 eligible women in the 1989 BFS and 6,515 women in the 1975 BFS were interviewed and these constitute the respondents for the present study. The details of the surveys are available elsewhere (see Huq and Cleland, 1990; BFS, 1978).

The BFS for both 1975 and 1989 involved the use of two basic questionnaires: a questionnaire on households which recorded information on all household members, and a questionnaire on individuals which recorded detailed information on eligible women who were identified from the household questionnaires. The questionnaires on individuals collected information on the respondent's background characteristics, reproductive history, knowledge and practice of family planning, breast-feeding practices, marriage, fertility preferences etc., as well as on her husband's background characteristics. In order to minimize recall biases, the basic methodology applied in this analysis is current status analysis: we used the current status of defined descriptive variables on each individual interviewed at the moment of the survey. **Results and discussion**

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 only these factors in the subsequent sections.

Age at marriage and proportion marrying

For females, early and universal marriage is customary in Bangladesh. The mean age at first marriage is one of the lowest in the world. During the period 1975-1976, the mean age at first marriage among all ever-married women in Bangladesh was reported to be 12.3 years (BFS, 1978). Several other studies in Bangladesh have also reported low female age at marriage (Obaidullah, 1966; Sadiq, 1965; Khuda, 1978). Although the average age at marriage has increased over the last two decades, childhood marriages are still prevalent in rural areas (Shaikh, 1984). The 1989 BFS data (table 1) suggest that the mean age at first marriage among ever-married women in Bangladesh is 14.8 years, which is well below the minimum legal age for marriage, i.e. 18 years, established by the Government in 1976. The mean age at first marriage for the cohort currently aged 20 to 24 years is higher than for other age cohorts. This indicates that older cohorts had a lower age at

marriage than their younger counterparts. The mean age at marriage has increased by 2.5 years in about 15 years. This is already implied in the trend of female singulate mean age at marriage (SMAM) - rising from 16.3 years in 1975 to 18 years in 1989. Male SMAM also increased over the same period by 1.5 years (from 24 years in 1975 to 25.5 years in 1989). Part of the explanation for this slow rise probably lies in the wide age gap between husbands and wives in Bangladesh, i.e. husbands were about nine years older than their wives in 1961 and about eight years older in 1989 (BFS, 1978; Huq and Cleland, 1990).

Table 1: Percentage of all ever-married women by age at first marriage and current age

Current	BFS 1989		BFS 1975	
	Mean age at first marriage	Per cent married	Mean age at first marriage	Percentage married
<20	14.5	51.0	12.8	58.1
20-24	15.3	88.0	12.7	95.4
25-29	15.2	97.7	12.5	99.0
30-34	14.9	99.7	11.7	99.8
35-39	14.6	99.9	11.9	99.8
40-44	14.1	99.8	11.8	99.9
45-49	13.8	100.0	11.5	100.0
Total	14.8		12.3	
Number	11,905	6,511		
Singulate mean age at marriage	18.0		16.3	

It is important to note that, while in 1975 less than 30 per cent of women aged 15-19 were single, nearly half of them were in this category in 1989 (Huq and Cleland, 1990). Further, since there is scope for a considerable further rise in age at marriage in the long run, there obviously would be a corresponding decline in fertility.

Distribution of the respondents by marital status showed that almost all women get married in Bangladesh by the time they are 35 years of age (Huq and Cleland, 1990). The variations in the proportion never married are slight and not substantial above the age of 30. Another important change since 1975 is a decline in the percentage of women who are widows. The proportions widowed in all age groups were consistently lower in 1989 than in 1975. As a result, the proportions of currently married women were higher in 1989 than in 1975 at all ages above 30, the net effect being an increase in fertility at ages 30 and above, offsetting the decrease in fertility at younger ages due to later age at marriage. Declining adult mortality may be responsible for this trend, but a higher probability of remarriage for widows cannot be ruled out.

Current fertility estimate

The current fertility rates can be estimated directly from survey data on the number of births occurring over the 12-month period prior to the survey date. But this method usually leads to an underestimate of current fertility rates owing to common problems of misstatement of the ages or birth-dates of children, and the omission and under-reporting of births. Brass, who examined the BFS 1975 data, also pointed out that some older women might have moved births occurring in the five years before the survey back to the period 5-9 years prior to the survey (Brass, 1978). By and large, the same possibility also holds true for the 1989 BFS. The application of indirect techniques based on the reverse survival method and the Gompertz relational model suggests a TFR in the neighbourhood of 5.5. The limitations of indirect techniques are, however, well documented.

Until further exploration of the data is undertaken, there is no perfect solution to this problem. However, a reasonable method for estimating current fertility is to follow the middle course of averaging the reported births of the five years prior to the survey date (1984-1988). The age-specific fertility rates derived in this way and the implied TFR (5.1) are presented in table 2. Huq and Cleland (1990), after an exhaustive review of the fertility rates in Bangladesh from 1978 to 1988, established as possible estimates of TFR for 1988 a range from 4.6 to 5.4. As a compromise, they suggested 4.9 as the TFR for 1988, which is the mid-point of the possible range. The 1989 Contraceptive Prevalence Survey (CPS) reported a TFR of 5.1 births per woman as the average for the five years prior to the survey date (Mitra and others, 1990). Whatever the level of fertility may have been in the late 1980s, there is ample evidence that during the last one and half decades (1975-1989) fertility in Bangladesh declined at least 20 per cent.

Table 2: Age-specific fertility rates (ASFRs) and age-specific marital fertility rates (ASMFRs) (five-year average)

Current age	ASFRs		ASMFRs	
	1975	1989	1975	1989
15-19	0.1090	0.1822	0.1677	0.3196
20-24	0.2886	0.2599	0.3196	0.3141
25-29	0.2911	0.2254	0.3161	0.2466
30-34	0.2502	0.1692	0.2757	0.1824
35-39	0.1848	0.1141	0.2192	0.1271
40-44	0.1074	0.0555	0.1363	0.0660
45-49	0.0347	0.0176	0.0488	0.0219
Total x 5	6.33	5.12	7.42	6.39

Source:BFS 1975 (1971-1975) and BFS 1989 (1984-1988)

The age-specific marital fertility rates have been derived by dividing the age-specific fertility rates by the proportions of women who were currently married in each age group, with minor adjustments for possible distortion in the proportion married in the 15-19-year-old age group.

The age-specific fertility rates, as presented in table 2, show a broad flat-top distribution. The fertility rate is highest among women aged 25-29; thereafter it declines. However, the marital age-specific fertility rate is highest among women aged 15-19 years. Age-specific fertility rates for all age groups were lower in 1989 than in 1975. The age pattern of fertility has changed considerably during the period 1975-1989; the shift is evident from a fall in mean age at child-bearing from 29.8 years in 1975 to 27.5 years in 1989. This suggests that child-bearing is taking place relatively earlier than previously, presumably because of greater fertility regulation at older ages in 1989.

Contraception

The contraceptive prevalence rate (CPR) in Bangladesh registered a steady rise from 7.7 per cent in 1975 to 31 per cent in 1989 (table 3). The CPR figures from the 1989 BFS (31 per cent) and the 1989 CPS (31.4 per cent) validate each other. Recently released 1991 CPS figures claim CPR to be over 40 per cent (Mitra and others, 1992). Most of the diffusion in contraceptive practice has taken place during the past decade, which is a reflection of the concerted efforts of the Government in conjunction with non-governmental organizations (NGOs) in the field in recent years. Even so, the agonizing fact remains that there is still heavy reliance on traditional methods, which accounted for as many as 25 per cent of all current users in 1989. Besides, the present acceptors of family planning are predominantly older couples with high parity. The fertility impact of contraception thus remains minimal.

Table 3: Level of current use of contraceptive methods among married women (per cent) for different years and their use-effectiveness

Methods	BFS	CPS	CPS	CPS	CPS	BFS	Use-effect
	1975	1981	1983	1985	1989	1989	
Modern (total)	5.0	11.0	13.8	18.4	24.4	23.4	
Pill	2.7	3.5	3.3	5.1	9.1	9.6	0.90
IUD	0.5	0.4	1.0	1.4	1.7	1.4	0.95
Injection	-	0.4	0.2	0.5	1.1	0.6	0.95
Condom	0.7	1.6	1.5	1.8	1.9	1.8	0.80
Vaginal	-	0.3	0.3	0.2	0.2	0.1	0.80
Tubectomy	0.6	4.0	6.2	7.9	9.0	8.5	0.99
Vasectomy	0.5	0.8	1.2	1.5	1.4	1.2	0.99
Traditional (total)	2.7	7.6	5.4	6.9	7.1	7.6	
Withdrawal	0.5	1.8	1.3	0.9	1.2	1.8	0.70
Safe period	0.9	3.9	2.4	3.8	3.9	4.0	0.70
Abstinence	1.0	1.2	0.4	0.5	0.5	1.0	0.70
Others	0.3	0.7	1.4	1.7	1.5	0.8	0.70
All	7.7	18.6	19.1	25.3	31.4	31.0	
Average use-effectiveness	0.837	0.872	0.872	0.875	0.885	0.870	

Table 3 shows that, of the total CPR by method, in 1975, only a little over 14 per cent was accounted for by sterilization. This figure plateaued in recent years, accounting for about one-third of the 1989 CPR. Knowledgeable observers are of the opinion that, while there could be other factors behind such a trend, the demand for sterilization has perhaps effectively been met, and it would be a formidable task to augment the number of new acceptors, except through special efforts. The proportional share of oral pills in CPR was as much as 19 per cent of total use in 1981, which rose to 31 per cent in 1989. Available statistics suggest that much of the total increase in the CPR in Bangladesh between 1975 and 1989 was due to the increased adoption of oral pills and sterilization. Among the traditional methods, the safe period shows an increasing trend and definitely lays claim to being a future research priority so as to ascertain exactly how Bangladeshi couples employ it and what success in preventing pregnancy they may expect from it. The use rate of the other contraceptive methods has been relatively static.

The family planning programme in Bangladesh has been oriented essentially towards females and operated largely through female functionaries in the field. This indicates that, as a proximate determinant of fertility, the potential of contraception for reducing fertility has been only partially realized so far (Duza, 1990).

Breast-feeding and post-partum amenorrhea

Like other duration variables, the estimation from retrospective histories of the duration of breast-feeding is a difficult task. Breast-feeding duration may be estimated from the last closed birth interval or from the last open birth interval; each method has its own merits and limitations. The present analysis is limited to open birth interval data. A typical life-table approach has been followed enabling the inclusion of periods of observations of censored as well as non-censored cases in estimating the average breast-feeding duration. The breast-feeding status of mothers whose children subsequently died but who were still breast-feeding on or before the survey date was considered as censored in life-table analysis. The same procedure has also been adopted for estimating the period of amenorrhea.

Table 4: Estimates of selected reproductive measures and derived indices of proximate determinants

A. Reproductive measures	BFS 1975	BFS 1989	%change
TFR (observed)	6.33	5.12	-19.12
TMFR	7.42	6.39	-13.88
CBR	47.00	35.80	-23.83
Proportion of contraceptive use	0.077	0.31	+302.60
Contraceptive use-effectiveness	0.837	0.870	+3.97
Mean duration of breast-feeding	31.0	30.40	-1.94
Mean duration of postpartum amenorrhea	14.60	11.52	-21.10
B. Model indices			
Cm	0.853	0.801	-6.10
Cc	0.930	0.709	-23.80
Ci	0.604	0.666	+10.30
Combined effect of four indices (Cm x Cc x Ca x Ci)	0.479	0.378	-21.10
TF	15.3	15.3	0.0

The results indicate that breast-feeding is almost universal in Bangladesh - more than 97 per cent of the women breast-fed their last-born child. The average duration of breast-feeding, as indicated by our analysis, is 30.4 months (table 4) which is in good agreement with the result (28.6 months) obtained by Huq and Cleland (1990) from the same set of data through the prevalence/incidence method. The 1989 CPS has also reported an average duration of breast-feeding of 30.6 months for the last open birth interval (Mitra and others, 1990). Available evidence suggests that the average duration of breast-feeding in Bangladesh has long been well above two years - one of the highest in the world. The 1975 BFS estimates of breast-feeding ranges between 29 and 31 months (Shuiab and Islam, 1988), showing that the duration of breast-feeding in Bangladesh has remained virtually unchanged over the last 15 years.

The mean duration of post-partum amenorrhea was estimated to be 11.5 months (table 4) for the country as a whole. This estimate is in close agreement with that obtained by Huq and Cleland (1990) through both the prevalence/incidence method (11.9 months) and the current status method (12.4 months). It has been observed that in the absence of breast-feeding, the average period of amenorrhea is 3.4 months, which is higher than observed in developed societies in Europe (Bongaarts and Potter, 1983).

There is ample evidence to suggest that, unlike for breast-feeding, the duration of amenorrhea is showing a declining

trend. The 1975 BFS reported a mean post-partum amenorrhea period of 14.6 months (Singh and Ferry, 1984). Chen and others (1974) found the median post-partum amenorrhea period to be around 17 months for a cohort of births (1969-1971) in Matlab, a rural area in Bangladesh. In another study, Ford and Kim (1987) reported that the median period of amenorrhea in Matlab was 14.7 months during the period 1975-1979. In a recent study which utilizes longitudinal data from Matlab, Salway and others (1992) observed that the median duration of post-partum amenorrhea fluctuated around 13 months for the cohorts of births during the period 1978-1983. Thereafter, a sharp decline occurred, with the duration falling from 13.5 months for the 1982-1983 cohort to 9.4 months for the 1988-1989 cohort. When only women who gave birth in 1989 were considered, the duration of post-partum amenorrhea was found to have fallen even more, to just 8.6 months. Salway and others also observed that the increased use of contraception may be one of the important contributing factors to the declining trend in post-partum amenorrhea in Bangladesh.

Fertility-inhibiting effects of the proximate determinants

Bongaarts (1978) showed that in any population the actual level of fertility achieved by a woman is influenced by seven intermediate variables or proximate determinants: marriage, contraception, induced abortion, lactational infecundability, fecundability, spontaneous intrauterine mortality and sterility. These variables together constitute a complete set of proximate determinants through which socio-economic and cultural factors affect fertility (Bongaarts and Potter, 1983). Bongaarts and Potter further demonstrated that most of the variations in fertility are mainly due to the differential impact of the first four of these variables. The survey data enable us to apply the Bongaarts model of proximate determinants of fertility. The model formulates the TFR that is determined by total fecundity (TF), * a hypothetical potential of fecundity that a woman would have in her lifetime, being inhibited by the indices of non-marriage (Cm), contraception (Cc), induced abortion (Ca) and lactational infecundability (Ci). The model can be quantified through the following equation:

$$TFR = Cm \times Cc \times Ca \times Ci \times TF.$$

The detailed exposition of the model is given elsewhere (Bongaarts and Potter, 1983). The summary measures that are needed for the application of the model are presented in the first panel of table 4. Owing to the unavailability of information on the sensitive issue of induced abortion, we have assumed that the overall total induced abortion rate is zero. Empirical observation suggests that, although TFR, TMFR (total marital fertility rate) and TN (total natural fertility rate) vary widely among populations, TF is rather stable at between 13 and 17 births per woman, with the standard value being 15.3. We too chose the value of 15.3 for the present analysis.

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* If in a population all women married early and if breast-feeding and post-partum abstinence, contraception and induced abortion are not practised, then the total fecundity rate (TF) is the expected number of children the women will bear during their reproductive life-span.

Since no national-level study on the use-effectiveness of different contraceptive methods has been conducted in Bangladesh, the use-effectiveness of the modern methods has been adopted here from the Matlab project of the International Centre for Diarrhoeal Disease Research, Bangladesh (Kabir and Rob, 1990). The last column of table 3 presents the method-specific use-effectiveness of the modern methods as observed in Matlab. The use-effectiveness of traditional methods is assumed to be 0.70.

The second panel of table 4 presents the estimated values of the indices of the four principal proximate determinants of fertility. Theoretically, the value of each index ranges from 0 to 1. The complement of each index represents the proportionate reduction in fertility attributed to each determinant of fertility; the smaller the index value, the greater is the fertility-reducing effect of the variable. The index Cm represents the proportion by which TFR is smaller than TMFR as a result of non-marriage. Similarly, the index Cc gives the proportion by which TMFR is smaller than TN through the use of contraception, and the index Ci gives by how much TN is smaller than TF due to the effect of lactational infecundability. Thus, in 1989 (table 4), the marriage pattern reduces the actual fertility level below marital fertility by almost 20 per cent (Cm=0.801). Contraception has a stronger effect on marital fertility, accounting for a reduction of just over 29 per cent (Cc=0.709) in TN relative to TMFR. Lactational infecundability has the highest fertility-reducing impact, reducing the total fecundity rate (TF) by more than 33 per cent (Ci=0.666).

To document changes among the indices over the period 1975-1989, estimates for two time points are compared in table 4. The results indicate that during the 15-year period, an appreciable amount of change has occurred only for contraceptive use. During the period 1975-1989, the index of marriage declined by just over 6 per cent and the index of contraception declined by almost 24 per cent, but the index of lactational infecundability increased by more than 10 per cent. Thus, the decline in TFR (from 6.3 to 5.1) between 1975 and 1989 was caused primarily by the fertility-reducing effect of contraception. The fertility-reducing effect of marriage pattern was offset by a reduction in duration of lactational infecundability. The combined fertility-limiting effect of the three proximate determinants (Cm, Cc, Ci) was 0.479 in 1975 and 0.378 in 1989, indicating a decline of just over 21 per cent in fertility during the period 1975-1989.

Table 5: Magnitude of the total inhibiting effect accounted for by each proximate fertility determinant : Bangladesh, 1975 and 1989

Proximate determinants (index)	Fertility-inhibiting effects			
	Births per woman		Percent	
	1975	1989	1975	1989
Marriage (Cm)	1.72	2.17	21.6	22.8
Contraception (Cc)	0.79	3.37	9.9	35.4
Lactational infecundability (Ci)	5.46	3.98	68.5	41.8
Total: [15.3-TFR (estimated)]	7.97	9.52	100.0	100.0

Note: The total fertility-inhibiting effect is prorated by the logarithm of each index, e.g. effect of marriage : [TF-TFR (estimated) x log Cm ÷ (logCm + logCc + logCa + logCi

Table 5 exhibits the magnitude of the total fertility-inhibiting effect being accounted for by each proximate fertility determinant at two points of time, 1975 and 1989. The difference between the total fecundity (TF), taken as 15.3, and the estimated TFR is attributed to the result of the inhibitory effect of each determinant, the total fertility-inhibiting effect is prorated by the proportion of the logarithm of each index to the sum of the logarithm of all indices (Wang and others, 1987). For example, the fertility-inhibiting effect of the marriage variable is obtained as:

[TF-TFR (estimated)] x logCm ÷ (logCm + logCa + logCi + logCc).

The fertility-inhibiting effects of other factors are obtained similarly. The results presented in table 5 indicate that, of a total of almost 8 births being inhibited in 1975, 1.7 births (21.6 per cent) are due to the effect of the marriage variable, 0.8 birth (9.9 per cent) is due to contraception and 5.5 births (68.5 per cent) are due to lactational infecundability. Similarly, in 1989, the three proximate variables (marriage, contraception and lactational infecundability) which inhibited 9.5 births, are distributed as 2.2 births (22.8 per cent), 3.4 births (35.4 per cent) and almost 4 births (41.8 per cent), respectively.

From the foregoing analysis, it may be noted that lactational infecundability has the highest fertility-reducing effect; this may be considered as the single most important determinant of fertility-reduction in Bangladesh. Although in 1975 the proportion of women non-married was the second most important fertility-reducing factor, by 1989 contraception appears to have taken this place and its fertility-inhibiting effect is steadily increasing. Although the impact of the non-marriage component has increased, 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 beyond 22 years does not seem to be very bright. On the other hand, the fertility-reducing effect of lactational infecundability is gradually decreasing. It should be noted that the joint effect of marriage and lactational infecundability did not change much during the 15-year period 1975-1989. This leads to the conclusion that future reductions in fertility in Bangladesh will depend largely on increased use of effective contraception.

Decomposition of the change in TFR: 1975-1989

A simple decomposition technique developed by Kitagawa (1955) is used here to decompose the TFR into a component due to changing age-specific proportions currently married and a component due to changing marital fertility rates. Each of these two major components is further decomposed by age. The decomposition summarizes simply and succinctly the contributions of nuptiality and marital fertility to overall fertility change. Unlike with the Bongaarts model, this technique utilizes information that is readily available and usually reliable. This decomposition will be followed later in this section by a further decomposition of the proximate determinants proposed by Bongaarts and Potter.

Table 6: Decomposition of TFR due to changes in nuptiality and marital fertility: 1975-1989

Age group	Change due to nuptiality	Change due to marital fertility	Total change	Percentage change
15-19	-.0974	+.4633	+.3659	18.9
20-24	-.1109	-.0329	-.1438	7.4
25-29	-.0141	-.3143	-.3284	16.9
30-34	+.0228	-.4278	-.4050	20.9
35-39	+.0521	-.4050	-.3529	18.2
40-44	+.0253	-.2844	-.2591	13.3
45-49	+.0160	-.1015	-.0855	4.4

Total	-.1062 (8.8%)	-1.1026 (91.2%)	-1.2088 (100%)	100.0 --

As may be noted from table 6, about 9 per cent of the decline was due to changes in nuptiality and the remaining 81 per cent to changes in marital fertility. When broken down by age, it is revealed that changes in nuptiality at the younger reproductive ages tended to reduce fertility, whereas changes in nuptiality at the older reproductive ages tended to increase it marginally. This occurred because the proportions married declined at the younger ages due to later marriage, but increased slightly at the older reproductive ages, owing probably to lower prevalence of widowhood associated with falling mortality. This is evident from the singulate mean age at marriage which increased from 16.3 to 18 years during the period.

The marital fertility component, when broken down by age, shows that the changes in marital fertility rates at all ages reduced fertility except for the age group 15-19 years (table 6). The increase in marital fertility for this age group may be attributed at least in part to a fall in very young marriage and adolescent subfecundity. Decreases in the age-specific marital fertility rates at the older ages are due primarily to increased use of contraceptives.

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, 1975 and 1989), Bongaarts and Potter (1983) turned the Bongaarts (1978) model into a decomposition equation. The equation states simply that a given proportional change in the TFR between two points of time equals the sum of the proportional fertility changes due to the different proximate determinants plus an interaction term.

Table 7: Decomposition of the change in TFR between 1975 and 1989

Factor responsible for fertility change	Percentage change in TFR	Distribution of percentage change in TFR	Absolute for change in TFR
Proportion of women married	-6.10	-31.90	-0.39
Contraceptive practice	-23.76	-124.27	-1.50
Duration of post-partum infecundability	+10.26	+53.66	+0.65
Other proximate determinants	+2.42	+12.66	+0.15
Interaction	-1.94	-10.15	-0.12
Total	-19.12	100.0	-1.21

The decomposition results are presented in table 7. It indicates that TFR declined during this period by a little over 19 per cent (or in absolute terms by 1.2 births per woman) from 6.3 births in 1975 to 5.1 in 1989. This total decrease in TFR is found to come from a decline of just over 6 per cent (or 0.39 birth per woman) owing to the marriage pattern, a decline of almost 24 per cent (or 1.5 births per woman) owing to an increase in contraceptive use, a 10.3 per cent (or 0.65 birth per woman) increase due to shortening of the duration of lactational infecundability. The change in TFR due to change in other proximate determinants is in no way negligible. In the second column of table 7, the decomposition results are standardized to add up to 100 per cent. It is evident that contraception played the largest role in the reduction of fertility during the period 1975-1989.

Conclusion and recommendations

In this study an attempt has been made to estimate the fertility-inhibiting effect of the three most important proximate determinants: marriage, contraception and lactational infecundability. The analysis shows that, although the fertility level of Bangladesh is declining, it is still very high (around 5 births per woman). Data on induced abortion are not available and its effect remains essentially unmeasurable. Lactational infecundability plays the most prominent role as a fertility-reducing factor. Contraception is the second most important factor followed by the marriage factor which plays the least role in the reduction of fertility. However, contraception is responsible for the substantial fall in fertility between 1975 and 1989. Our analysis suggests that the fertility-reducing effect of contraception is steadily increasing, whereas the effect of lactational infecundability remains nearly constant.

The fertility-reducing effect of the marriage variable is also 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 1975-1989 their joint effect remained almost constant (i.e. Cm x Ci = 0.53). Unless the age at marriage continues to rise, the use of contraception will be the dominant factor in any further reduction in fertility. The national goal of attaining replacement level fertility by the year 2005 could be achieved if the rate of use of contraception could be increased to 70 per cent.

Although socio-economic development is desirable and would enhance the status of women, yet it does not seem to be a pre-condition for 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, programme managers, administrators and policy makers should work to provide a method mix that meets the varied needs of clients and is financially and programmatically feasible as well. Research in developing countries has confirmed that the provision of clients with a variety of appropriate contraceptive options and a high-quality services programme can help couples to achieve their desired level of fertility, improve contraceptive prevalence and accelerate fertility decline.

Of the four proximate determinants we have presented, the index of contraception may have been underestimated by using the reported contraceptive prevalence and employing a set of method-specific use-effectiveness data obtained from a small experimental area of Bangladesh which may not be representative of the country as a whole. Owing to the increased awareness among couples of the advantages of small family size, a substantial proportion of women with low parity may have been practising contraception, but they are not motivated strongly enough to practise it consistently. Therefore, among the respondents, contraceptive prevalence may be over-reported and contraceptive use elsewhere in Bangladesh may not be as effective as that used in Matlab. As a result, the index of contraception will have a depressing effect on the estimate of the fertility level.

Policy implications that can be drawn from this study as they relate to the achievement of further fertility decline are as follows. There is a need to: (a) campaign for a further increase in the age at marriage of women, especially in rural areas, (b) encourage efforts to increase the quality and the quantity of contraceptive use to achieve higher use-effectiveness that will lead to a greater contribution to fertility decline, (c) provide a method mix that meets the varied needs of couples, (d) increase programme efforts to maintain current performance levels, (e) ensure the commitment of additional resources to maintain current programme momentum and (f) provide more information to women about the low cost and much greater benefits of longer duration breast-feeding in order to encourage full and intensive breast-feeding.

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