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BANGLADESH CONTRACEPTIVE PREVALENCE SURVEY - 1985

Secondary Analysis

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INTRODUCTION

The 1985 Bangladesh Contraceptive Prevalence Survey (CPS) is the fourth national survey conducted to assess family planning program performance in Bangladesh. The eligible woman sample of the 1985 CPS consisted of 10,305 ever-married women under 50 years of age, with 7,682 rural and 2,623 urban respondents. A 25 percent subsample of couples from the eligible women sample was also undertaken to assess sex differentials in the reported use of male contraceptive methods.

The primary object of the CPS is to measure retrospective and current contraceptive use (prevalence) among women of reproductive age over time. The CPS also routinely collects information on contraceptive knowledge, socio-economic characteristics of users and non-users, sources of supply for family planning services, reasons for non-use and future intention to use contraception. Such information, which constitutes the core component of the CPS, has been presented in the 1985 CPS Final Report (Mitra and Associates, 1987).

In addition to conventional family planning performance measures such as the contraceptive prevalence rate, the 1985 CPS collected supplemental information of utility to family planning program managers and policy makers. Respondents provided basic demographic information useful in estimating levels and trends in fertility and mortality; namely, the number of children ever-born, the number of births in the twelve month period preceding the interview date of the survey, and the number of children surviving. These measures, in conjunction with statistics describing the socio-economic characteristics of respondents, enable one to investigate factors that may be important in determining levels of fertility and mortality. The 1985 CPS also obtained data that allow for the estimation of unmet contraceptive need, the duration of modern and traditional method use, and characteristics of breastfeeding.

This report presents secondary analysis based upon demographic, socio-economic, and program measures derived from the 1985 CPS. To a considerable extent, this analysis incorporates data not previously reported in the 1985 CPS Final Report. Chapter One presents estimates of the levels and trends of fertility and mortality from the 1985 CPS, and compares these results with past CPS and other survey data. Chapters Two and Three investigate socio-economic differentials in fertility and mortality. Unmet contraceptive need and reasons for the non-use of family planning services are discussed in Chapter Four. Chapter

Five presents a detailed study of the duration of modern method use in the Bangladesh family planning program and identifies continuation rate differentials in relation to various respondent and household attributes. Characteristics of breastfeeding (including estimates of breastfeeding duration) are presented in Chapter Six. An analysis of women interviewed in both the 1983 and 1985 CPS is presented in Chapter Seven. Using linear logistic regression and proportional hazard models, Chapter Seven identifies variables associated with the acceptance, continuation and termination of family planning methods among women interviewed in both the 1983 and 1985 CPS samples. Chapter Eight incorporates CPS estimates of the proximate determinants of fertility to assess family planning program performance.

The secondary analysis presented in this report should be of interest to population and health professionals involved in family planning program evaluation, management and policy formulation. Research identifies problems associated with demographic measurement in Bangladesh, provides possible explanations for the low utilization of family planning services, describes the effectiveness of contraceptive use, identifies factors associated with the adoption, continuation, and termination of contraceptive use, and relates projected family planning performance levels to demographic change. These, and other topics discussed in this report, should be carefully reviewed in reaching conclusions concerning past FP/MCH performance and in developing new policy initiatives to enhance the effectiveness of service delivery.

Chapter One

LEVELS AND TRENDS IN FERTILITY AND MORTALITY IN BANGLADESH

Andrew Kantner and Elizabeth Frankenberg

INTRODUCTION

The Government of Bangladesh currently maintains that high population growth is the "number one problem" facing the country. Development objectives pertaining to food self-sufficiency, employment, education, and the provision of quality health services are thought to be inexorably linked with the rate of population growth. Unfortunately, while there is general agreement that population growth is high in Bangladesh, there is little consensus regarding actual levels and trends of fertility and mortality.

Uncertainty surrounding demographic measurement in Bangladesh arises from (1) the questionable quality of the national demographic data base and (2) methodological problems inherent in adjusting defective demographic data. Given the strength of current empirical evidence, it is difficult to compute reliable national estimates of fertility and mortality for any given time period. However, if a wide range of data sources and estimation methods are critically evaluated, it is nevertheless possible to draw tentative conclusions regarding the course of vital events in Bangladesh.

National estimates of fertility and mortality in Bangladesh have been generated from two primary sources; namely, vital event surveys and sample vital statistics (dual record) registration. During the nineteen seventies, the two principal sources of national demographic data were the 1974 Bangladesh Retrospective Survey of Fertility and Mortality, conducted in conjunction with the 1974 Population Census (BBS:1976) and the 1976 Bangladesh Fertility Survey (BFS), (WFS:1976). The major national demographic surveys during the nineteen eighties have been the 1980 Baseline Demographic Survey (BBS:1982), the 1981 Census Sample Enumeration (BBS:1987), and biennial Contraceptive Prevalence Surveys conducted between 1979 and 1985. The Bangladesh Bureau of Statistics implemented a national sample vital statistics registration system in 1981. This instrument yields demographic estimates based upon Chandrasekaran-Deming dual record correction factors for missed vital events.

The most recent national demographic information in Bangladesh emanates from the BBS Sample Vital Statistics Registration System (VRS) and the 1979-85 Contraceptive Prevalence Surveys (CPS). Unfortunately, 1979-85 CPS data on fertility and mortality are limited to three items of information; namely, the total number of children ever-born to women of reproductive age (retrospective fertility), the number of children born to women of reproductive age in the twelve month period prior to the survey (period fertility), and the number of children surviving. Birth and pregnancy histories, which allow for more detailed analysis of fertility and mortality patterns (e.g. birth interval dynamics), were not incorporated in the 1979-85 CPS rounds. Despite this limitation, it is still possible to generate estimates of fertility and mortality from the information routinely collected by the CPS.

LEVELS AND TRENDS IN FERTILITY

Tables 1 and 2 provide estimates of the average number of children ever-born for all women and ever-married women respectively from the major censuses and surveys conducted in present-day Bangladesh between 1961-1985. These age-specific average parities represent the cumulative (retrospective) fertility experience of women during the course of their reproductive lives. For example, women aged 30-34 in the 1985 CPS had an average of 5.1 live births. These births occurred over roughly a 15-19 year period prior to the 1985 CPS enumeration.

Given the uneven coverage of the various surveys reported in Tables 1 and 2, it is difficult to identify long-term trends in reported average parities. For example, the high number of children ever-born in the 1976 Bangladesh Fertility Survey relative to the 1961 Census and 1974 BRSFM is most likely a reflection of improved coverage of births rather than an increase in fertility.

Reasonably consistent coverage of vital events through time is provided by the 1979-85 biennial CPS (1). The

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1. The fieldwork for the 1985 CPS was undertaken during December-April, 1986 (eligible women sample) and May-July, 1986 (couple sample). This staggered schedule resulted from the decision to collect couple sample data once the eligible women sample had already been partially completed. Since data from the 1985 CPS measures demographic behaviour occurring through mid-1986, the 1985 CPS should, strictly speaking, be identified as the 1985/86 CPS.

average parities reported between 1979-85 for women aged 15-34 have remained essentially constant. The minor differences that can be identified could easily be attributed to sampling error. Among women aged 35-49, average parities were considerably higher in 1983 and 1985 than in 1979 and 1981, which suggests that the coverage of births was superior in the 1983 and 1985 surveys.

If one compares 1983-85 CPS results, there is evidence that average parities for the age groups 15-19, 20-24, 25-29 and 30-34 may have declined somewhat. However, it is worth noting that these average parities constitute period fertility experience over various durations of time prior to the date of the survey (e.g., five to ten years for the age group 20-24 and 15-19 years for the age group 30-34). If period fertility rates for ages 15-34 did decline significantly between 1983 and 1985, this change would only be partially reflected by the average parties reported in Tables 1 and 2. In other words, reductions in the average number of children ever-born between 1983 and 1985 would tend to lag behind declines in cumulated period fertility rates for the same period.

Table 3 presents estimates of period age-specific fertility rates based upon births occurring twelve months prior to the date of enumeration. As in the case of children ever-born, differences in coverage tend to obscure long-term trends. However, with the exception of the 1976 Bangladesh Fertility Survey, unadjusted TFR estimates between 1974 and 1985 are in the range of 4.6-5.0. A comparison of 1983 and 1985 CPS estimates indicates that the unadjusted TFR declined from 4.9 to 4.6 (1). As is shown below, age-specific fertility rates for total women have declined for ages 15-34, while declines in marital ASFRs are concentrated among women aged 20-34, which suggests that an increase in age at

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1. The 1979 CPS did not collect data on births occurring twelve months prior the survey. While the 1981 CPS did collect this information, results were considered to be unreliable and have not been published.

marriage may be largely responsible for the ASFR decline from .157 to .130 for all women aged 15-19.

	Marital ASFR		Total Women ASFR	
	1983 CPS	1985 CPS	1983 CPS	1985 CPS
15-19	.256	.256	.157	.130
20-24	.284	.279	.256	.248
25-29	.246	.215	.227	.201
30-34	.200	.173	.186	.160
35-39	.124	.129	.108	.117
40-44	.060	.058	.049	.048
45-49	.008	.027	.006	.018

While the figures presented in Table 3 suggest that there may have been some decline in fertility between 1983 and 1985, these estimates are not overly reassuring with regard to the level of fertility. Application of the Brass P/F ratio method (which adjusts period fertility estimates for levels of underreporting implied by the average number of children born to women aged 20-24 and 25-29) indicates that unadjusted period fertility may be underreported by as much as 43 percent in the 1983 CPS and 41 percent in the 1985 CPS (1). These estimates are obtained using Trussell's adaptation of the Brass P/F ratio method. The Trussell modification, which employs model fertility schedules to derive current average parity equivalents (F), yields results roughly similar to the original Brass P/F ratio technique.

Table 4 presents adjusted age-specific and total fertility rates derived from the P/F ratio method. These estimates indicate that the TFR declined from 7.0 in 1983 to 6.5 in 1985 (a decline of 7.1 percent). As can be seen in Table 5, this decline was most pronounced in urban areas, although rural unadjusted and adjusted TFRs also fell somewhat between 1983-85.

The high levels of fertility obtained from the Brass P/F ratio method raise serious methodological issues regarding the validity of the P/F ratio adjustment in the present demographic context of Bangladesh. The basic rationale of this procedure is that births reported in the twelve months prior to the survey enumeration are underreported owing to (1) the omission of actual parities and (2) age misreporting for births under one year of

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1. For a complete description of this method, see United Nations, Manual X: Indirect Techniques for Demographic Estimation, (New York: UN/DIESA, Population Studies No. 81, pp. 31-37).

age (i.e. births that actually occurred less than twelve months prior to the date of enumeration are incorrectly reported as being more than twelve months old). In order to obtain reliable period fertility estimates, correction factors based upon the comparison of retrospective fertility (P) (children ever-born by age of mother) and cumulated period fertility (F) for ages 20-24 and 25-29 are applied to the schedule of unadjusted age-specific fertility rates (1). In other words, the level of fertility is derived from P while the age pattern of fertility is obtained from F.

The validity of the P/F ratio adjustment rests on the assumption that fertility has remained constant. If this assumption is violated (e.g. through an increase in the age at marriage or the widespread adoption of contraception), it is not possible to determine whether the P/F ratio reflects underreporting of period fertility or an actual decline in fertility. While reports of children ever-born are of course not totally insensitive to recent reductions in fertility, especially among younger women, declines in the level of P will tend to lag behind changes in F when fertility is falling. In such situations, P/F ratio correction factors will tend to over-adjust estimates of period fertility. This bias becomes more severe as the rate of fertility decline increases.

As noted previously, there is evidence from 1983 and 1985 CPS estimates of retrospective and period fertility that the level of fertility may have fallen over this period. Corroborating evidence for this decline is provided by the substantial rise in the Contraceptive Prevalence Rate (CPR) between 1983 and 1985. As can be seen in Table 6, the CPR rose from 19.1 to 25.3 percent as measured by the eligible

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1. When there is evidence that fertility is declining, the P/F ratio for the age group 20-24 may provide more reasonable correction factors in that recent fertility change is more likely to be reflected in the P values for this age group. The average number of children born to women aged 20-24 occurred over a 5-10 year period preceding the survey enumeration date while average parities for women aged 25-29 are based upon a 10-15 year period of reproductive life. This analysis employs P(2)/F(2) rather than (P(2)/F(2)+P(3)/F(3))/2.

woman sample and 21.7 to 29.8 percent in the couple sample (1). Therefore, there is reason to suspect that recent P/F ratio estimates of fertility from the CPS may be too high.

While recent TFR estimates may be over-estimated using the P/F ratio method, it is also doubtful whether unadjusted 1983-85 TFR estimates ranging from 4.6-4.9 give an accurate reading of true national fertility levels. To various degrees, all past fertility surveys in Bangladesh have underestimated period fertility. The likely underreporting of period fertility in recent CPS surveys can be appreciated by estimating Crude Birth Rate (CBR) estimates implied by the level of CPR. Mauldin and Segal (1986) have developed a regression equation based upon the experience of developed and developing countries that predicts the CBR from CPR; namely,

$$CBR = 49.07 - (.43 * CPR).$$

In a society with no modern or traditional contraceptive use, the CBR would equal 49.07 live births per 1,000 population. For each percentage increase in CPR, the CBR declines by .43 live births. Therefore, the 1985 CPS couple sample CPR of 29.8 indicates that the 1985 CBR could be as low as 36.1, with the eligible woman sample CBR = 38.0. Corresponding TFR estimates (derived by linking the CBR and TFR through a population projection program incorporating the 1981 Population Census age distribution and the 1981 ICDDR,B Matlab comparison area age pattern of fertility) are 5.3 for the couple sample and 5.6 using the eligible woman sample (see Table 6).

While the Mauldin/Segal formulation provides an additional clue as to the actual level of fertility in Bangladesh, these figures may nevertheless be seriously misleading. The CBR and TFR estimates obtained in this instance assume that the practice of contraception in Bangladesh is not unlike average international experience with regard to use effectiveness, continuation of use, and method mix. In addition, the age at marriage, breastfeeding duration, postpartum infecundability, induced abortion and the incidence of secondary sterility are assumed to be

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1. Couple and eligible women samples were conducted in both 1983 and 1985 in order to estimate underreporting of male method use in the eligible women sample. Comparison of these two samples indicates that in 1983 women underreported the use of vasectomy by 108 percent and condom use by 80 percent, while in 1985 these methods were underreported by 153 and 122 percent respectively.

similar to international levels. In other words, the proximate determinants of fertility in Bangladesh must be judged to be similar to international norms in order to place serious weight on the CBR and TFR estimates derived from the Mauldin/Segal regression analysis.

While reliable national data on many of the proximate determinants of fertility are not presently available in Bangladesh, it is clear that the age at marriage and age at first birth are quite low by international standards. The contraceptive method mix is weighted in favour of permanent method use that entails a relatively high age of acceptance and low potential fertility impact. For example, in the 1985 CPS, the use of voluntary sterilization accounted for 37.3 percent of all users (51.1 percent of modern method use), with the average age of acceptance being 41.6 years for vasectomy clients and 29.3 years for tubectomy clients as of April-June 1987 (Quasem, 1987:53-54). In addition, the level of modern method discontinuation is probably somewhat high in relation to the experience of other developing and developed countries. The 1985 CPS has also reported low domiciliary coverage levels for family planning services. Between 1983 and 1985, the percentage of eligible women ever-visited in the home by a family planning worker in the six months preceding the interview date actually declined from 30.1 to 27.3 percent (Mitra and Associates, 1987:215). Therefore, the CBR and TFR estimates derived from the Mauldin/Segal formulation are probably somewhat low and should be treated as lower bound estimates.

Additional information regarding the level and trend of fertility between 1983 and 1985 is obtained by disaggregating retrospective and period fertility estimates in relation to ever-users and never-users of contraception. Tables 7 and 8 present estimates of children ever-born and period age-specific fertility rates for ever-users and never-users. These data indicate that ever-users in both 1983 and 1985 had higher average parities than never-users. This finding indicates that higher parity women were more inclined to control their fertility. However, period age-specific fertility rates shown in Table 8 present a somewhat different picture, with never-users reporting higher fertility than ever-users. The unadjusted TFR for never-users in 1983 and 1985 was 5.4 while the ever-user TFR declined from 4.4 to 3.7 between 1983 and 1985. This reported decline may be a reflection of the increase in ever-use of contraception between 1983 and 1985 (from 28 to 33 percent of all eligible women) and more effective patterns of use.

Tables 9 and 10 present P/F ratio adjustment factors and adjusted period fertility estimates for ever-users,

never-users and total 1983 and 1985 CPS samples. While composition effects resulting from higher average parity (and possibly fecundity) levels for ever-users than never users may bias results derived from the P/F ratio method, the disaggregated findings shown in Tables 9 and 10 may nevertheless prove instructive. For example, P/F ratios for never-users remain relatively constant by age while increases are recorded for ever-users. This finding suggests that fertility is declining among ever-users but is constant among never-users. The adjusted TFR for never-users (which represents roughly 66 percent of all women of reproductive age) was 7.3 in 1983 and 7.2 in 1985. Since fertility does not appear to be declining among never-users, the constant fertility assumption of the P/F ratio method has probably not been violated. Therefore, adjusted TFRs for never-users may be credible estimates, which implies that the total national TFR for all women in both 1983 and 1985 may have been between 6.5 and 7.0.

Adjusted fertility rates for ever-users, while lower than estimates for never-users, indicate that the ever-user TFR declined from 6.8 in 1983 to 5.2 in 1985. This precipitous fall is improbable. Even with an increase in the ever-use of contraception from 28 to 33 percent, and allowing for a shift to more effective method use, it is still doubtful whether the ever-user TFR could have fallen by 1.6 children in just two years. This anomaly instead points to the danger of applying the P/F ratio method to disaggregated data when a parity selection bias is known to operate (i.e. ever-users of contraception report higher average parities than never-users) (1). However, while the actual level of the ever-user TFR is uncertain, results in Tables 8 and 10 do lend support to the view that fertility has declined between 1983 and 1985.

An additional methodological approach that can be illuminating when fertility is thought to be declining is the comparison of average period fertility rates with average parities for a hypothetical cohort. This procedure is capable of generating fertility estimates that are robust to declines in fertility. Hypothetical cohorts based

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1. The uneven ever-user P/F ratios for the age groups 20-24 and 25-29 in the 1985 CPS suggest that significant errors may exist in the reporting of average parities or period fertility. Deriving a correction factor from the average of P(2)/F(2) and P(3)/F(3) may generate a more reasonable ever-user TFR for 1985 in this instance; namely, K = 1.556 and TFR = 5.8.

upon five year inter-survey parity increments and average inter-survey period fertility rates are utilized to estimate fertility (1). However, the reliability of this method is dependent upon reasonably consistent coverage of births in two surveys five to ten years apart.

Unfortunately, as was noted in Tables 1-2, coverage of average parities in the 1983 and 1985 CPS appears to be superior to the 1981 CPS. The implied increase in fertility between 1981 and 1983 is not consistent with other evidence suggesting a decline in fertility over this period (e.g. the increase in contraceptive prevalence). The 1983-85 declines in average parities and period fertility are consistent with an increase in the CPR (from 19.1 to 25.3 percent in the eligible women sample and 21.7 to 29.8 percent in the couple sample) and a decline in the proportions of women ever-married. However, if one compares 1981-85 average parities, fertility levels must be judged to have been nearly constant. An additional problem affecting hypothetical cohort estimates stems from the non-availability of 1981 period age-specific fertility rates. These estimates were considered to be unreliable and therefore not published in the 1981 CPS final report.

Given the margin of error that may effect the 1983 TFR estimate derived from the hypothetical cohort procedure, results were considered to be potentially misleading and are therefore not presented. If the coverage of births in the 1988 CPS is similar to the 1983 and 1985 surveys, the hypothetical cohort procedure may yet be capable of generating plausible estimates of fertility in Bangladesh.

In summary, it is not possible to draw firm conclusions about recent levels and trends in fertility in Bangladesh. While available evidence points to a decline in recent years (particularly for the 1983-85 period), the level of fertility is highly uncertain.

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1. Data from the 1981 CPS were collected during the second quarter of 1981 while 1985 figures were obtained over the first two quarters of 1985. Therefore, the actual time interval between the 1981 and 1985 CPS enumerations was approximately five years. For a complete description of this method, see United Nations, Manual X: Indirect Techniques for Demographic Estimation, op. cit., pp. 41-45).

P/F ratio estimates indicate that fertility may still be quite high in Bangladesh (1985 TFR = 6.5). Since the Brass method (and the Trussell variant utilized in this analysis) assume constant fertility, there is reason to doubt the applicability of the P/F ratio adjustment in an environment such as Bangladesh where contraceptive prevalence has reached nearly 30 percent and fertility is thought to be declining. However, it is worth remembering that the P/F ratio technique is not totally insensitive to declining fertility. Declines in average parities will tend to lag behind reductions in period fertility, thereby generating a temporal distortion in the fertility estimates derived by the P/F ratio method.

The Mauldin/Segal TFR estimate geared to the 1985 couple sample is 5.3. However, as noted previously, this estimate is probably too low since the proximate determinants of fertility in Bangladesh (e.g. the average age at marriage and modern method discontinuation) are generally not consistent with average international experience. Therefore, one is left with the unsatisfactory dilemma of concluding that the 1985 TFR in Bangladesh could conceivably lie in a range anywhere from 5.3-6.5. Given the doubts that arise from the two extreme point estimates that anchor this range, a more realistic approximation would embrace TFRs from 5.4-6.2. However, when comparing 1983 and 1985 completed parities for women aged 45-49 (7.5 and 7.2 respectively) with plausible period fertility estimates in 1983 and 1985, there is evidence that fertility has declined in recent years in Bangladesh.

LEVELS AND TRENDS OF MORTALITY

The 1979-85 Contraceptive Prevalence Surveys have routinely collected data on the number of children ever-born and the number of ever-born children surviving. From this information, it is possible to derive estimates of infant and child mortality and the level of life expectancy.

Table 11 presents data on the proportion of children dead by age of mother from the 1974 Bangladesh Retrospective Survey of Fertility and Mortality, the 1976 Bangladesh Fertility Survey, and the biennial 1979-85 CPS. As was the case in the analysis of fertility, differences in survey coverage confound the identification of infant and child mortality trends over the period 1974-81. Comparisons of 1974 BRSFM and 1976 BFS findings with 1985 CPS estimates suggest that child mortality has declined substantially between 1974 and 1985. However, a similar downward trend is not apparent if one compares 1979 and 1985 CPS results.

The data in Table 11 imply that infant and child mortality have declined between 1974-76 and 1985. However, much of this decline appears to have occurred during the nineteen seventies. If the coverage of births and deaths improved significantly between 1974-76 and 1985, the magnitude of this mortality decline may be under-estimated. Data presented in Table 12 indicate that the reporting of dead female children has improved when comparing 1974 BRSFM and 1985 CPS data. This finding implies that 1974 BRSFM and 1976 BFS mortality rates may be somewhat low in relation to results from the 1985 CPS.

Over the period 1979-85, it is difficult to discern a clear trend in the proportion of children dead by age of mother. The 1979 and 1981 CPS enumerations report nearly identical proportions of children dead for women aged 15-24. The 1979-81 increase in the proportions of children dead among women aged 25-49 is probably the result of improved reporting of children that have died rather than an increase in mortality. The apparent increase in mortality in the 1983 CPS may also largely reflect improved survey coverage since women aged 30-44 report significantly higher proportions of children dead than in the 1981 CPS.

Comparison of 1983 and 1985 CPS data indicate that infant and child mortality may have declined since the proportion of children dead among women aged 15-29 has declined while women aged 30-49 report similar proportions of children that have died. This stability in the older age groups suggests that the coverage of deaths in the 1983 and 1985 CPS was consistent, which leads to the conclusion that 1983-85 mortality declines reported by younger women aged 15-29 may be real.

Table 13 presents information on the average number of children ever-born and the average number of children dead by age of mother. The biennial 1981-85 CPS indicates that women aged 45-49 had an average of 2.1-2.3 dead children during their reproductive lives. Survey data between 1974-79 show that the average number of dead offspring for women aged 45-49 was between 1.5-2.0. This difference probably results from inferior coverage of children that have died in 1974-79 survey data. It is unlikely that sporadic mortality surges (such as occurred during the 1974-75 famine) could increase infant and child mortality to the extent implied by 1974-85 trends among women aged 45-49.

Estimates of infant and child mortality can be derived from data on the proportions of children dead by age of mother given in Table 11. The technique employed to convert the proportion of children dead to conventional life table probabilities of not surviving to exact age x (q(1), q(2), q(3), and q(5)) was originally developed by Brass. Multiplying factors that perform this conversion are selected on the basis of two indices measuring the age pattern of fertility; namely, ratios of average parities for women aged 15-19, 20-24 and 25-29 (P(1)/P(2) and P(2)/P3)) and the mean age of the fertility distribution. The method assumes that fertility and mortality have not changed appreciably in the recent past. If fertility has been declining and the proportion of first births in relation to total births among younger women increasing, the method may tend to overestimate child mortality. On the other hand, if mothers significantly underreport dead children relative to surviving children (which is highly plausible), then child mortality will be under-estimated. To some extent, these two potential sources of bias are off-setting.

Sullivan and Trussell later refined the Brass multiplying factors, although practice has shown that all three methods yield roughly similar results. The Trussell multipliers, which are based on a broad range of model fertility schedules that include populations with extremely young age patterns of fertility, were employed in deriving the infant and child mortality estimates given in Table 14 (1). Coale-Demeny West pattern model life tables were incorporated in the Trussell multipliers utilized for this analysis (2).

The estimates of q(x) and l(x) given in Table 14 indicate that infant and child mortality have remained quite high in Bangladesh. According to the 1985 CPS, the

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1. A complete description of the Trussell variant of the original Brass method is provided in United Nations, Manual X: Indirect Techniques for Demographic Estimation, op. cit., pp. 76-81.

2. Since the West mortality pattern includes a wide range of survivorship probabilities and generates q(x) estimates that are rough averages of values obtained from the North, South, and East patterns, it was thought advisable to utilize the West pattern to derive the mortality estimates given in Table 14.

number of children who die before their second birthday is 188.9 per 1,000 live births (or 18.89 percent of all children born alive die by age 2 while 81.11 percent survive). By the age of 5, 224.8 children have died per 1,000 live births (or 22.48 percent of all children born alive die before their fifth birthday while 77.52 percent survive).

Trends in infant and child mortality between 1974 and 1985 provide evidence of a gradual decline in mortality among children less than 2 years of age. The 1974 BRSFM and the 1976 BFS report q(2) values of .2058 and .2019 respectively while 1981-85 CPS q(2) estimates range from .1861 to.1889. However, q(5) figures are surprisingly constant between 1974-1985 (with the exception of the 1979 CPS), varying in a narrow range from .2218 to .2458. While differences in survey coverage make comparisons difficult, there does appear to have been little change in under age 5 child mortality.

Infant mortality rate trends derived directly from estimates of q(1) are erratic over the period 1974-85. In addition, IMR levels are extremely high (IMR = 170.6 in the 1985 CPS). Owing to age reporting problems at the start of childbearing and the relatively low number of births and child deaths occurring among women aged 15-19, q(1) mortality estimates are generally considered to be unreliable. In deriving final estimates of infant and child mortality, q(2) generally provides more reliable indications of recent mortality levels.

Table 14 also presents estimates of the reference period (tx) to which q(x) and l(x) estimates refer. In the 1985 CPS, t(x) values imply that estimates of q(1), q(2), q(3) and q(5) refer to periods .63, 2.08, 4.19 and 6.65 years prior to the survey. Therefore, the q(2) mortality rate of 188.9 child deaths per 1,000 live births recorded in the 1985 CPS actually corresponds to a period mortality life table in effect during 1984 (as noted previously, most 1985 CPS data were actually collected during the first two quarters of 1986). Similarly, q(2) estimates for 1983 and 1981 refer to the first quarter of 1981 and the second quarter of 1979 respectively. Since q(2) levels have remained essentially unchanged in the 1981-85 CPS, one may conclude that child mortality through the second year of life has not changed between 1979-84. Comparing q(5) estimates from the 1981-85 CPS, one can also surmise that mortality in the under 5 population did not change appreciably between 1974 and 1979.

Using the United Nations South Asian model life table, estimates of life expectancy e(0), life expectancy at

age 10 (e(10)), the infant mortality rate (IMR), and child mortality rate (CMR) were computed. These estimates, which are given in Table 15, confirm that infant and child mortality remain high in Bangladesh. As noted previously, infant mortality rates derived from q(1) are not generally considered to be reliable, and therefore are not discussed further. The 1985 CPS estimate of e(0) derived from q(2) is only 48.6 (which refers to a period life table prevailing in 1984). Life expectancy estimates from the 1981 and 1983 CPS also imply that e(0) was around 49 years, which leads one to the unavoidable conclusion that there is no evidence of an increase in life expectancy between 1979-84. However, e(0) comparisons between the 1974 BRFSM, the 1976 BFS, and 1981-85 CPS do suggest that life expectancy may have increased by around three years between 1972-74 and 1979-84.

Infant mortality and child mortality rates derived by fitting estimates of q(2), q(3) and q(5) to the United Nations South Asian model life table are also very high. The infant mortality rate based upon q(2) from the 1985 CPS was 144 (which refers to the period IMR prevailing in 1984). As in the case of e(0), infant and child mortality rates derived from q(2) show little change over the 1979-84 period. However, 1972-74 IMRs obtained from the 1974 BRSFM and the 1976 BFS were 155 and 152 respectively, which suggests that the IMR may have declined slightly between 1972-74 and 1979-84. The child mortality rate (CMR), which is the number of child deaths per 1,000 population aged 1-4, appears to have declined somewhat more rapidly than the IMR over this same period.

The life expectancy estimates reported in Table 15 are derived from United Nations South Asian model life tables using levels of infant and child mortality computed from the proportion of dead ever-born children. These e(0) estimates were derived without any reference to independent estimates of adult mortality. If adult mortality had been declining despite continuing high levels of infant and child mortality, the levels of e(o) derived from the United Nations South Asian model life table based upon q(2), q(3) or q(5) would likely be too low.

Unfortunately, the 1985 CPS did not collect extensive information on adult mortality. The only 1985 CPS data comes from reports of the proportion of ever-married women who are widowed. Using the Brass/Hill widowhood method,

it is possible to convert this information into male adult survivorship probabilities (1). Female adult mortality cannot be estimated using this procedure since all males interviewed in the 1985 CPS Couple Sample were currently married.

Despite the fragmentary nature of 1985 CPS data on adult mortality, it is possible to compute male adult survivorship probabilities and, again employing the United Nations South Asian model life table, derive corresponding levels of life expectancy from adult ages 20 to 50. These findings, which are shown below, indicate levels of mortality consistent with levels based upon child deaths reported in Tables 15 and 16.

n	l(n)	e(0)
25	.7296	49.2
30	.7280	50.0
35	.7134	49.9
40	.6867	49.3
45	.6361	48.6
50	.6092	48.1

The life expectancy at birth computed for different adult male ages ranges from 48.1 to 50.0 years, while the e(0) based upon q(2) and q(5) was 48.6 and 49.5 respectively.

The consistency between child and adult male mortality levels implies that the United Nations South Asian model life table provides a reasonably accurate depiction of the age pattern of mortality in Bangladesh. Since both child and adult male mortality estimates imply a life expectancy at birth of around 48-51 years, the United Nations South Asian model life table with an e(o) of 50 can be employed as a reasonable representation of mortality conditions prevailing in Bangladesh as of 1984.

Final mortality levels can be derived for the period 1982-1984 by averaging q(2) and q(3) estimates from the 1985 CPS. Results indicate that life expectancy over this period was 50.0 years, e(10) was 55.2 years, the infant mortality rate was 138, and the child mortality rate was 26.4.

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1. A complete description of the Brass/Hill widowhood method is given in United Nations, Manual X: Indirect Techniques for Demographic Estimation, op. cit., pp. 110-114.

COMPARISON OF CPS FERTILITY AND MORTALITY ESTIMATES WITH ICDDR,B DEMOGRAPHIC ESTIMATES FROM SMALL AREA FP/MCH PROJECTS

The International Centre for Diarrhoeal Disease Research, Bangladesh routinely collects vital statistics from small area project sites in Bangladesh. Data are collected through complete household registration (the Demographic Surveillance System (DSS) in Matlab and Teknaf Upazilas) and sample household registration (the Sample Registration System (SRS) in the Upazilas of Aboynagar, Sirajganj, Gopalpur and Fultala). Vital rate estimates derived from these project areas are generally considered to be reasonably reliable and may serve as useful benchmarks for comparison with CPS estimates.

Vital statistics from DSS and SRS surveillance programs for the period 1981-1985 are given in Tables 16-21. Results indicate that fertility and mortality rates vary considerably in different regions of the country. Intensive FP/MCH treatment areas such as Matlab (where the 1985 Contraceptive Prevalence Rate was approximately 45 percent) and Aboynagar have lower fertility and mortality than less developed areas such as Sirajganj and Teknaf. In 1983, the CBR ranged from 34.2 in the Matlab treatment area to 53.4 in Teknaf and the CDR from 11.9 in the Matlab treatment area and Aboynagar (an estimate which combines the treatment area of Aboynagar and the comparison area upazila of Futala) to 18.5 in Sirajganj. Rates of natural increase (RNI) in all sites (program and comparison areas) are generally equal to or greater than 20.0 per 1,000 population throughout the 1981-85 period.

Fertility rate estimates presented in Table 19 show that the TFR in 1983 ranged from 4.3 in Aboynagar to 7.5 in Teknaf. While it is difficult to judge the reliability of national CPS estimates through comparisons with small area project data, a disturbing anomaly nevertheless can be identified when contrasting the 1983 CPS age pattern of fertility with similar ICDDR,B data. As can be seen in Table 20, 1983 CPS age-specific fertility rates for the age groups 15-19 and 20-24 are high in comparison with ICDDR,B data. In particular, the 1983 CPS adjusted ASFR for the age group 15-19 appears to be seriously inconsistent with other evidence. The percentage distribution of fertility by age from the 1983 CPS and 1983 DSS data are as follows:

Proportional Distribution of Fertility by Age

	1983 CPS		1983 Matlab		1983
	Unadjusted	Adjusted	Treatment	Comparison	Teknaf
15-19	15.9	18.7	11.8	10.0	14.4
20-24	25.9	25.6	26.7	22.9	21.3
25-29	23.0	22.6	25.5	23.5	21.5
30-34	18.8	18.1	19.5	21.0	18.7
35-39	10.9	10.3	12.5	14.6	14.3
40-44	5.0	4.3	3.9	6.0	6.6
45-49	.6	.4	.2	2.0	3.2

As can be seen in Tables 20 and 21, the 1983 CPS reports far younger age patterns of fertility than does ICDDR,B surveillance data. Of particular note is the comparison of 1983 CPS and Teknaf data. Teknaf upazila (located in the southern tip of Bangladesh adjacent to Burma) is generally acknowledged to have unusually high fertility in contrast to other regions. It is difficult to accept the CPS result that the national age pattern of fertility is considerably younger than in Teknaf (particularly P/F ratio adjusted estimates for age groups 15-19 and 20-24 compared with Teknaf findings). If one is confident that ICDDR,B DSS estimates are reasonably accurate, then questions arise regarding the reliability of CPS fertility data.

The possible sources of error in CPS fertility data are not inconsiderable. Age misreporting could be partly responsible for the generation of anomalies. In addition, the size of the never-married population in the age groups 15-19 and 20-24 may be underreported in the CPS household listing operation, thereby generating unrealistically high age-specific fertility rates for total women in the age groups 15-19 and 20-24. Period age-specific fertility rates may also be distorted due to inaccurate attribution of children's age by respondents and field interviewers (although this problem often leads to underreporting rather than overreporting of period fertility). Unfortunately, with the data presently available from the CPS, it is not possible to extensively investigate these potential problems. Until additional evidence can be presented, one cannot draw definitive conclusions regarding the reliability of CPS fertility data (particularly the age pattern of fertility reported by the 1983 and 1985 CPS). The collection of full birth histories (planned for the 1988 CPS) may help dispel the uncertainty that currently surrounds the estimation of fertility in Bangladesh.

As can be seen Table 21, infant mortality rates estimated from the 1983 and 1985 CPS are not substantially different from levels obtained in certain ICDDR,B project areas (e.g. Sirajganj and Teknaf). However, a national 1982-84 IMR figure of 138 is still somewhat higher than official estimates (e.g. the Bangladesh Government Planning Commission reports a 1985 IMR of 125; Bangladesh Planning Commission, 1985:372). Life expectancy data have not been published for most ICDDR,B project areas during the 1981-1986 period. However, 1983 Matlab treatment and comparison area e(o) estimates of 56.4 and 50.5 would suggest that the 1982-1984 e(0) of 50.0 years derived from the 1985 CPS is not unreasonable.

Given the uncertainty that presently surrounds estimates of national mortality levels, and the importance of reliable morbidity and mortality data in monitoring FP/MCH/PHC program implementation, it would appear prudent to consider implementing national morbidity and mortality surveys or surveillance systems designed to collect reasonably high quality health statistics. Reliance upon the CPS for such information (which is not its intended purpose) will likely prove to be a false economy.

Table 1: Children Ever-Born Per Total Women, 1979-1985 CPS and Other Sources

Age	Census 1961	BRSFM 1974	BFS 1975	CPS 1979	BLDS 1980	CSE 1981	CPS 1981	CPS 1983	CPS 1985
15-19	.7	.4	.6	.4	.4	.5	.5	.6	.4
20-24	2.2	1.8	2.3	2.1	1.7	1.9	2.0	2.2	2.0
25-29	3.3	3.5	4.2	3.6	3.3	3.5	3.7	3.8	3.6
30-34	4.6	4.9	5.7	5.0	4.8	5.0	5.4	5.5	5.1
35-39	5.2	5.9	6.7	6.0	5.8	6.1	6.4	6.5	6.5
40-44	5.5	6.2	7.1	6.5	6.4	6.7	7.3	7.4	7.4
45-49	5.7	6.1	6.7	6.6	6.5	6.8	7.6	7.5	7.2

Table 2: Children Ever-Born Per Ever Married Women, 1985 CPS and Other Sources

Age	Census 1961	BRSFM 1974	BFS 1975	CPS 1979	BLDS 1980	CSE 1981	CPS 1981	CPS 1983	CPS 1985
15-19	.8	.6	.8	.6	.6	.7	.8	.9	.7
20-24	2.2	1.9	2.4	2.1	1.8	1.9	2.1	2.3	2.1
25-29	3.5	3.5	4.2	3.6	3.3	3.5	3.7	3.8	3.6
30-34	4.6	4.9	5.7	5.0	4.8	5.0	5.4	5.5	5.1
35-39	5.2	5.9	6.7	6.0	5.8	6.1	6.4	6.5	6.5
40-44	5.5	6.2	7.1	6.5	6.4	6.7	7.3	7.4	7.4
45-49	5.7	6.1	6.7	6.6	6.5	6.9	7.6	7.5	7.2

CENSUS (1961) - 1961 Population Census
BRSFM - 1974 Bangladesh Retrospective Survey of Fertility and Mortality (1974 Census)
BFS - 1976 Bangladesh Fertility Survey (WFS)
BLDS - 1980 Baseline Demographic Survey (BBS)
CSE - 1981 Census Sample Enumeration (1981 Census)
CPS (1979) - 1979 Contraceptive Prevalence Survey
CPS (1981) - 1981 Contraceptive Prevalence Survey
CPS (1983) - 1983 Contraceptive Prevalence Survey
CPS (1985) - 1985 Contraceptive Prevalence Survey

Table 3: Period Age-Specific Fertility Rates (Children Born 12 Months Prior to Census/Survey)

Age	BRSFM 1974	BFS 1974-6	BLDS 1980	CPS 1983	CPS 1985
15-19	.104	.186	.121	.157	.130
20-24	.230	.322	.244	.256	.248
25-29	.215	.300	.228	.227	.201
30-34	.182	.227	.195	.186	.160
35-39	.133	.148	.127	.108	.117
40-44	.064	.069	.060	.049	.048
45-49	.034	.016	.025	.006	.018
Unadjusted TFR	4.8	6.3	5.0	4.9	4.6

Table 4: Adjusted Age-Specific Fertility Rates, 1974 BRSFM, 1980 BLDS, 1983 and 1985 CPS

Age	BRSFM 1974	BLDS 1980	CPS 1983	CPS 1985
15-19	.189	.189	.263	.220
20-24	.348	.323	.359	.347
25-29	.320	.297	.317	.278
30-34	.268	.249	.254	.221
35-39	.192	.159	.145	.157
40-44	.089	.074	.060	.062
45-49	.042	.039	.006	.020
P/F Ratio K	1.500	1.320	1.428	1.413
Adjusted TFR (P/F Ratio Method)	7.2	6.6	7.0	6.5

Table 5: Urban/Rural Children Ever-Born, Period Fertility and Adjusted Period Fertility, 1983 and 1985 CPS

	1983 CPS		1985 CPS	
	Children Ever Born		Children Ever Born	
Age	Urban	Rural	Urban	Rural
15-19	.6	.6	.4	.4
20-24	1.9	2.2	1.8	2.0
25-29	3.6	3.9	3.2	3.6
30-34	5.1	5.5	4.6	5.2
35-39	6.0	6.6	6.0	6.5
40-44	7.1	7.3	7.0	7.5
45-49	7.5	7.5	7.4	7.4
	Period Fertility		Period Fertility	
Age	Urban	Rural	Urban	Rural
15-19	.136	.157	.131	.129
20-24	.259	.255	.222	.249
25-29	.198	.231	.136	.212
30-34	.164	.188	.113	.168
35-39	.104	.109	.096	.119
40-44	.021	.052	.028	.056
45-49	.007	.007	.021	.022
Unadjusted TFR	4.4	5.0	3.7	4.8
	Adjusted Period Fertility		Adjusted Period Fertility	
Age	Urban	Rural	Urban	Rural
15-19	.215	.265	.209	.220
20-24	.333	.363	.282	.355
25-29	.253	.327	.176	.298
30-34	.208	.260	.149	.234
35-39	.124	.148	.120	.162
40-44	.025	.065	.036	.073
45-49	.007	.007	.022	.025
Adjusted TFR (P/F Ratio Method)	5.9	7.2	5.0	6.8

Table 6: Contraceptive Prevalence Rates, 1979-1985, and Maudlin/Segal and BBS (VRS) CBR and TFR Estimates

	Eligible Women Sample				Couple Sample (Working Rates)	
Methods	1979	1981	1983	1985	1983	1985
Modern Methods	8.9	10.9	13.8	18.4	16.2	22.9
Oral Pill	3.6	3.5	3.3	5.1	3.3	5.1
Condom	1.5	1.6	1.5	1.8	2.7	4.0
Vaginal Method	.1	.3	.3	.2	.3	.2
Injection	.2	.4	.2	.5	.2	.5
IUD	.2	.4	1.0	1.4	1.0	1.4
Tubectomy	2.4	4.0	6.2	7.9	6.2	7.9
Vasectomy	.9	.8	1.2	1.5	2.5	3.8
Traditional Methods	3.8	7.7	5.4	6.9	5.5	6.9
Safe Period	2.2	3.9	2.4	3.8	2.4	3.8
Withdrawal	.2	1.8	1.3	.9	1.3	.9
Abstinence	.8	1.2	.4	.5	.4	.5
Other	.6	.7	1.4	1.7	1.4	1.7
Any Method	12.7	18.6	19.1	25.3	21.7	29.8
No Method	87.3	81.4	80.9	74.7	78.3	70.2
CBR and TFR Estimates						
Mauldin/Segal						
CBR	43.6	41.1	40.9	38.2	39.7	36.3
TFR	6.4	6.1	6.1	5.6	5.8	5.3

1. The 1983 CPS eligible women survey results do not add exactly to 19.1% owing to rounding errors.

Table 7: Children Ever Born for Ever-Users and Never-Users of Contraception For Total Ever and Never-Using Women, 1983 and 1985 CPS

Age	Ever-Users 1983	Ever-Users 1985	Never-Users 1983	Never-Users 1985
15-19	.8	.5	.5	.4
20-24	2.4	2.3	2.1	1.8
25-29	3.9	4.1	3.7	3.5
30-34	5.7	5.3	5.3	5.0
35-39	6.9	6.5	6.3	6.4
40-44	7.7	7.4	7.2	7.4
45-49	8.1	7.1	7.3	7.3

Table 8: Period Age-Specific Fertility Rates for Ever-Users and Never-Users of Contraception For Total Ever and Never-Using Women, 1985 CPS

Age	Ever-Users 1983	Ever-Users 1985	Never-Users 1983	Never-Users 1985
15-19	.167	.208	.155	.116
20-24	.234	.186	.268	.275
25-29	.177	.108	.265	.270
30-34	.140	.098	.219	.207
35-39	.082	.082	.128	.141
40-44	.052	.042	.045	.051
45-49	.020	.024	.002	.017
TFR	4.4	3.7	5.4	5.4

Table 9: P/F Ratios for Ever-Users and Never-Users of Contraception, 1985 CPS

Age	Ever-Users 1983	Ever-Users 1985	Never-Users 1983	Never-Users 1985	Total Sample 1983	Total Sample 1985
15-19	1.942	1.042	1.524	1.429	1.615	1.322
20-24	1.556	1.378	1.338	1.341	1.421	1.415
25-29	1.528	1.754	1.279	1.240	1.381	1.480
30-34	1.710	1.884	1.284	1.255	1.443	1.506
35-39	1.786	2.003	1.269	1.336	1.458	1.588
40-44	1.852	2.100	1.348	1.420	1.517	1.670
45-49	1.872	1.902	1.358	1.358	1.520	1.579
K	1.556	1.378	1.338	1.341	1.421	1.415

Table 10: Adjusted Age-Specific Fertility Rates for Ever-Users and Never-Users of Contraception for Total Ever and Never-Using Women, 1985 CPS

Age	Ever-Users 1983	Ever-Users 1985	Never-Users 1983	Never-Users 1985	Total Sample 1983	Total Sample 1985
15-19	.306	.329	.244	.188	.263	.220
20-24	.350	.232	.360	.377	.359	.347
25-29	.269	.147	.350	.355	.317	.278
30-34	.209	.134	.281	.268	.254	.221
35-39	.123	.110	.159	.177	.145	.157
40-44	.075	.054	.050	.062	.061	.062
45-49	.025	.027	.002	.017	.006	.020
TFR	6.8	5.2	7.3	7.2	7.0	6.5

Table 11: Proportions of Children Dead by Age of Mother; 1974 BRSFM, 1976 BFS, 1979-85 CPS

Age	BRSFM 1974	BFS 1976	CPS 1979	CPS 1981	CPS 1983	CPS 1985
15-19	.185	.250	.143	.144	.197	.165
20-24	.206	.208	.190	.190	.197	.188
25-29	.213	.214	.194	.216	.207	.197
30-34	.228	.246	.180	.222	.230	.229
35-39	.240	.254	.183	.234	.249	.250
40-44	.264	.282	.185	.274	.282	.265
45-49	.285	.299	.227	.303	.286	.287

Table 12: Proportions of Children Dying by Sex of Child and Age of Mother, 1974 BRSFM, and 1985 CPS

	1974 BRSFM		1985 CPS	
Age Group	Males	Females	Males	Females
15-19	.1962	.1742	.183	.146
20-24	.2114	.1953	.189	.186
25-29	.2240	.2020	.187	.191
30-34	.2358	.2201	.230	.228
35-39	.2454	.2337	.247	.254
40-44	.2645	.2624	.268	.263
45-49	.2775	.2911	.310	.263

Table 13: Average Number of Children Ever-Born and Children Dead by Age of Mother; 1974 BRSFM, 1976 BFS, 1981 CSE and 1979-85 CPS

	BRSFM 1974		BFS 1976		CPS 1979		CPS 1981	
Age	CEB	CD	CEB	CD	CEB	CD	CEB	CD
15-19	.4	.1	.6	.2	.4	.6	.5	.1
20-24	1.8	.4	2.3	.5	2.1	.4	2.0	.4
25-29	3.5	.8	4.2	.9	3.6	.7	3.7	.8
30-34	4.9	1.1	5.7	1.4	5.0	.9	5.4	1.2
35-39	5.9	1.4	6.7	1.7	6.0	1.1	6.4	1.5
40-44	6.2	1.6	7.1	2.0	6.5	1.2	7.3	2.0
45-49	6.1	1.7	6.7	2.0	6.6	1.5	7.6	2.3

	CPS 1983		CPS 1985	
Age	CEB	CD	CEB	CD
15-19	.6	.1	.4	.1
20-24	2.2	.4	2.0	.4
25-29	3.8	.8	3.6	.7
30-34	5.5	1.3	5.1	1.2
35-39	6.5	1.6	6.5	1.6
40-44	7.4	2.1	7.4	1.9
45-49	7.5	2.1	7.2	2.1

Table 14: Estimation of Child Mortality from Proportions of Children Dead q(x) (Obtained from Coale-Demeny West Mortality Pattern) and Corresponding Reference Period Estimates t(x)

	BRSFM 1974	BFS 1976	CPS 1979	CPS 1981	CPS 1983	CPS 1985
q(1)	.1728	.2137	.1529	.1266	.1666	.1706
q(2)	.2058	.2019	.1900	.1861	.1883	.1889
q(3)	.2098	.2082	.1849	.2106	.2071	.1904
q(5)	.2291	.2458	.1741	.2219	.2300	.2248
l(1)	.8272	.7863	.8471	.8734	.8334	.8294
l(2)	.7942	.7981	.8100	.8139	.8177	.8111
l(3)	.7902	.7918	.8151	.7894	.7929	.8096
l(5)	.7709	.7542	.8259	.7781	.7700	.7752
t(1)	.81	.96	.49	.91	.96	.63
t(2)	2.20	2.42	2.04	2.36	2.50	2.08
t(3)	4.12	4.38	4.37	4.32	4.56	4.19
t(5)	6.32	6.58	7.12	6.53	6.37	6.65

Table 15: Levels of Infant Mortality and Life Expectancy Implied from Estimates of q(1), q(2), q(3) and q(5), 1985 CPS (Using UN South Asian Model Life Tables)

	BRSFM 1974	BFS 1976	CPS 1979	CPS 1981	CPS 1983	CPS 1985
q(1)						
e(0)	42.8	35.2	46.8	52.3	44.0	43.3
e(10)	51.8	48.1	53.7	56.4	52.4	52.0
IMR	174	214	153	127	167	171
CMR	39.8	59.1	31.8	22.6	37.3	38.8
q(2)						
e(0)	46.3	46.9	48.5	49.1	48.8	48.6
e(10)	53.5	53.7	54.4	54.8	54.6	54.6
IMR	155	152	145	142	143	144
CMR	32.7	31.6	28.8	27.7	28.2	28.6
q(3)						
e(0)	48.9	49.1	52.0	48.8	49.2	51.3
e(10)	54.7	54.8	56.2	54.6	54.8	55.9
IMR	143	142	128	143	142	131
CMR	28.0	27.7	23.1	28.2	27.6	24.1
q(5)						
e(0)	49.2	47.5	55.3	49.0	49.1	49.5
e(10)	54.8	54.0	57.7	54.8	54.8	55.0
IMR	142	149	112	142	142	140
CMR	27.6	30.6	17.9	27.9	27.7	27.1

Table 16: Crude Birth Rates in Matlab (Program and Comparison Areas), Teknaf, Aboynagar and Sirajganj (1981-1985) (1)

Crude Birth Rate	1981	1982	1983	1984	1985
Matlab					
Treatment Area	35.3	36.9	34.2	30.7	34.4
Comparison Area	43.8	44.6	42.6	37.3	42.6
Teknaf	51.5	54.2	53.4	55.2	54.1
Aboynagar(*)	-	-	34.8	29.5	33.2
Sirajganj(*)	-	-	44.1	46.6	44.5

* - Combines both treatment and comparison (natural) areas.

Table 17: Crude Death Rates in Matlab (Program and Comparison Areas), Teknaf, Aboynagar and Sirajganj (1981-1985)

Crude Death Rate	1981	1982	1983	1984	1985
Matlab					
Treatment Area	11.9	12.5	11.9	13.4	10.1
Comparison Area	14.4	15.9	16.7	17.3	14.2
Teknaf	14.2	13.6	14.7	17.1	12.8
Aboynagar(*)	-	-	11.9	11.3	11.3
Sirajganj(*)	-	-	18.5	19.3	14.5

* - Combines both treatment and comparison (natural) areas.

1. Data obtained from Chowdhury, et al. (1983), Shaikh, et al. (1984 and 1985); Rahman, et al. (1984); Mozumder and Phillips, (1984); Razzaque and Hosne Ara Begum (1988); Khan, et al. (1988); and Mozumder, et al. (1988).

Table 18: Rates of Natural Increase in Matlab (Program and Comparison Areas), Teknaf, Aboynagar and Sirajganj (1981-1985) (1)

Rate of Natural Increase	1981	1982	1983	1984	1985
Matlab					
Treatment Area	23.4	24.4	22.3	17.3	24.3
Comparison Area	29.4	28.7	25.9	20.0	28.4
Teknaf	37.3	40.6	38.7	38.1	41.3
Aboynagar(*)	-	-	22.9	18.2	21.9
Sirajganj(*)	-	-	25.6	27.3	30.0

* - Combines both treatment and comparison (natural) areas.

Table 19: Total Fertility Rates in Matlab (Program and Comparison Areas), Teknaf, Aboynagar and Sirajganj (1981-1985) (1)

Total Fertility Rate	1981	1982	1983	1984	1985
Matlab					
Treatment Area	4.8	5.0	4.5	4.0	4.5
Comparison Area	6.3	6.3	6.1	5.1	5.9
Teknaf	7.7	7.9	7.5	7.8	8.1
Aboynagar(*)	-	-	4.3	3.8	3.1
Sirajganj(*)	-	-	6.1	6.4	6.1

* - Combines both treatment and comparison (natural) areas.

1. Data obtained from Chowdhury, et al. (1983), Shaikh, et al. (1984 and 1985); Rahman, et al. (1984); Mozumder and Phillips, (1984); Razzaque and Hosne Ara Begum (1988); Khan, et al. (1988); and Mozumder, et al. (1988).

Table 20: 1983 Age-Specific Fertility Rates in Matlab (Program and Comparison Areas), Teknaf, Aboynagar and Sirajganj Compared with 1983 CPS (1)

	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1983 CPS							
Unadjusted	.157	.256	.227	.186	.108	.049	.006
Adjusted	.263	.359	.317	.254	.145	.060	.006
1983 ICDDR,B Project Areas							
Matlab							
Treatment	.106	.240	.229	.175	.112	.035	.002
Control	.123	.282	.289	.258	.179	.073	.025
Teknaf	.216	.320	.322	.281	.214	.099	.048
Aboynagar	.191	.217	.279	.136	.095	.032	.000
Fultala	.132	.272	.184	.195	.095	.128	.019
Sirajganj	.184	.281	.254	.249	.186	.070	.003
Gopalpur	.208	.253	.245	.210	.155	.055	.010

* - Combines both treatment and comparison (natural) areas.

Table 21: Infant Mortality Rates in Matlab (Program and Comparison Areas), Teknaf, Aboynagar and Sirajganj (1981-1985)

Infant Mortality Rate	1981	1982	1983	1984	1985
Matlab					
Treatment Area	102.6	105.6	98.2	114.8	86.0
Comparison Area	114.5	118.3	112.5	127.1	118.4
Teknaf	139.9	118.6	153.8	152.3	123.3
Aboynagar(*)	-	-	124.0	145.7	121.1
Sirajganj(*)	-	-	161.5	175.2	166.6

* - Combines both treatment and comparison (natural) areas.

1. Data obtained from Chowdhury, et al. (1983), Shaikh, et al. (1984 and 1985); Rahman, et al. (1984); Mozumder and Phillips, (1984); Razzaque and Hosne Ara Begum (1988); Khan, et al. (1988); and Mozumder, et al. (1988).

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Chapter Two

FERTILITY DIFFERENTIALS IN BANGLADESH

Shamsuddin Ahmed

INTRODUCTION

The main objective of this paper is to examine fertility differentials using data from the 1985 CPS and to compare these findings with results from the 1983 CPS. This analysis uses two measures of fertility: cumulative and current fertility. Cumulative fertility is measured by the mean number of children ever-born to currently married women. Current fertility is the number of births occurring in the twelve month period prior to the CPS enumeration and is measured by the marital age specific fertility rate (MASFR) and the total marital fertility rate (TMFR). Since equal weight is given to each age group of eligible women in estimating the TMFR, 158 eligible women under 15 years of age in 1983 and 118 eligible women less than 15 years of age in 1985 are not considered in calculating fertility levels and differentials. The number of eligible women included in this analysis is 7500 in 1983 and 7704 in 1985.

Both cumulative and current fertility measures may be affected by data limitations. The definition of current fertility is the number of births occurring over the twelve month period prior to the interview date. There is a tendency on the part of eligible women to report the interval between the date of last childbirth and the date of interview in rounded whole years rather than exact numbers of months and years. Moreover many women are not in a position to provide exact information on their age or the age of their children. Consequently, inexact reporting is likely to affect the estimated level of current fertility.

In the case of cumulative fertility, recall lapse affecting the reporting of vital events in the distant past may be a serious problem. In Bangladesh, data on the number of children ever born and still living are not completely error-free due to underreporting. This may result from the omission of children who have died or who are living away from home, and failure to distinguish live births. Furthermore, the inexact reporting of mother's age is also a serious problem for the estimation of current and cumulative fertility. However, differentials in current

and cumulative fertility can be usefully examined even though levels of fertility may be affected by such data limitations.

FERTILITY DIFFERENTIALS

Current and cumulative fertility differentials for currently married women under 50 years of age are presented in this analysis. Three variable categories are considered: (i) socio-cultural measures (place of residence, religion, wife's education, husband's education, husband's occupation and availability of electricity in respondent's household and locality); (ii) demographic variables (use of contraceptive methods and desire for children) and (iii) economic variables (household landownership status and wife's employment status).

Place of Residence

Fertility differentials by place of residence appear to be more pronounced in 1985 than in 1983. In 1985, the TMFR is 19 percent lower in urban than rural areas (4.7 urban and 5.8 rural), while the urban/rural differential is only 8 percent in 1983 (5.5 urban and 6.0 rural; see Table 1). Age-specific fertility rates for the prime reproductive ages (women aged 20-40) are lower in urban than in rural areas, with urban/rural differentials more pronounced in 1985 than in 1983.

Cumulative fertility data show that women living in urban areas have a slightly lower mean number of children ever-born compared to women living in rural areas. This is true for both 1983 and 1985 CPS data. Cumulative fertility is slightly lower for urban than rural women for age groups 20-44 years in 1985 and for age groups 20-49 years in 1983, but for other age groups parity is essentially the same for both rural and urban women (Table 2).

Although rural-urban fertility differentials are more pronounced in 1985 than in 1983, they are small in magnitude. Small fertility differentials by place of residence are also found in other studies such as the 1974 Bangladesh Retrospective Survey of Fertility and Mortality 1974 (GOB, 1976b:144), Bangladesh Census of 1974 (GOB, 1977a,: 583), Bangladesh Fertility Survey of 1975 (GOB, 1978:68), the 1979 CPS (NIPORT, 1981:85-86), and Ahmed (1979). Such low differentials may be attributed to the following factors. Bangladesh is still predominantly rural. Traditional norms and practices prevail in rural areas. Any person who has spent his early life in rural

areas is likely to retain traditional values when residing in urban areas later in life. Since most urban people in Bangladesh are migrants from rural areas, urban existence is, to some extent, an extension of rural life.

Religion

The TMFR among Muslim women is 51 percent higher than among non-Muslim women in 1985 (5.9 and 3.9 respectively), while it is 5 percent higher in 1983 CPS data (5.9 and 5.6 respectively; see Table 3). In 1985, MASFRs among Muslim women were higher than among non-Muslim women for all age groups, while MASFRs among Muslim women in 1983 are only higher for age groups 25-34.

Data on cumulative fertility in 1983 and 1985 show that the mean number of children ever-born among Muslim women is slightly higher than among non-Muslim women. This relationship is observed in all age groups in 1985. With the exception of the age group 15-19, a similar pattern is noted in 1983 (Table 4).

Higher fertility among Muslim women is also found by other studies such as Davis (1951), Stoeckel and Chowdhury (1969), GOB (1977b; 1978), Obaidullah (1966) Chowdhury (1971; 1975) and NIPORT (1981). This differential may be partly attributable to earlier marriage among Muslims. In addition, Muslims have different remarriage and ritual abstinence patterns than non-Muslims (Hong, 1980: 28). Furthermore, Muslims are reported to have slightly higher coital frequency than non-Muslims (Maloney et al. 1981). Moreover, non-Muslims tend to be more highly educated and more readily adopt family planning (NIPORT, 1981:64; MIS, 1983:164).

Education

1985 CPS data show that women with no schooling have a TMFR of 6.1, those with primary schooling 4.9, and those with secondary schooling and above 4.4. The 1983 CPS indicates that women with no schooling have a TMFR of 5.9, those with primary schooling 6.2, and those with secondary schooling and above 4.4 (Table 5). Thus an inverse relationship between fertility and female education is obtained in 1985, while an inverted-U shaped pattern is documented in 1983.

Data on cumulative fertility in 1985 shows an inverse relationship between mean number of children ever born and

female educational level. The mean number of children ever-born is 4.2, 4.1 and 3.4 among women with no schooling, primary schooling and secondary schooling and above. A similar relationship is also obtained in 1983. Furthermore, cumulative fertility in 1985 is negatively related to the mean number of children ever-born and female education level for women aged 15-44. Cumulative fertility in the 1983 CPS reveals an inverse relationship for all age groups (Table 6).

A negative relationship between fertility and female education is supported by such studies as Stoeckel and Chowdhury (1969), GOB (1977a,1978) and Khuda (1985b); while an inverted-U relationship is supported by other research; e.g. Chowdhury (1977), NIPORT (1981), Maloney et al. (1981) and Khuda (1985a). The negative relationship between fertility and female education may be explained as follows. Education increases chances for a woman to participate in the paid labour force, thereby creating a trade-off between time spent in childbearing and childrearing, on the one hand, and economic and other gains from working on the other. Secondly, education enhances a women's status and increases her exposure to new information and ideas, reduces social and cultural prejudices, and thus induces behavioural change. As has been often noted, female education is most often positively associated with the use of contraception (NIPORT, 1981; MIS, 1983; GOB, 1978). In addition, education affects age at marriage in three ways: (i) schooling over an extended period leads to postponement of marriage because studies interfere with household duties; (ii) after receiving higher education women may be more anxious to work outside the home and seek a husband of similar educational status (which may delay finding a suitable mate); and (iii) education may foster new values and aspirations which may be inconsistent with early marriage and childbearing.

Female education can also have a major pronatalist effect if it reduces the incidence or duration of breastfeeding by mothers. Women with no schooling have been found to breastfeed, on average, one month longer than women with primary and higher levels of education (GOB,1978).

Husband's Education

The 1985 CPS reports that women with husbands having no schooling had a TMFR of 5.8, while those with husbands having primary and secondary schooling (and above) had TMFRs

of 6.0 and 5.1 respectively. The 1983 CPS reveals that fertility tended to have an inverse relationship with husband's education (Table 7).

Data on cumulative fertility in 1983 and 1985 suggests a negative relationship between mean number of children ever born and husband's education. The TMFR for women whose husbands have no schooling is 4.1, while women with husbands having primary and secondary (and above) education have TMFRs of 4.2 and 3.8 respectively. This relationship is consistent across most age groups. Similar relationships are also observed for cumulative fertility data in the 1983 CPS (Table 8).

The inverse relationship between the mean number of children ever-born and husband's education is supported by BFS data (GOB, 1978), while NIPORT (1981) reports an inverted-U shaped relationship between the general fertility rate (GFR) and husband's education. It should be noted that fertility differentials due to husband's education result not only from husband's education but also from the cumulative effect of both husband's and wife's education (GOB, 1978:69-70). This is because more highly educated men are likely to marry better educated women.

Husband's Occupation

The 1985 CPS reveals that women whose husband's occupation was white collar (government service and private professional) have the lowest TMFR (4.8) of any occupational group. Among agrarian occupations (agriculturist, share-cropper, and labourer) women whose husbands are sharecroppers had the lowest TMFR (5.5); (see Table 9).

1985 cumulative fertility reports that the mean number of children ever-born is lower for women that have husbands with white collar jobs. This finding is consistent for all age groups (Table 10). Among agrarian occupational groups, the mean number of children ever born is the same for women whose husbands are agriculturists, share-croppers and labourers. It is interesting to note that the pattern of cumulative fertility by occupation in 1985 has some similarity with 1975 BFS data. For instance, the BFS found that the lowest number of live births occurred among women whose husbands had white collar jobs. However, among agrarian occupations, the BFS reported that women having labourers as husbands had the lowest number of live births (GOB, 1978: 70-71).

Fertility differentials due to husband's occupation possibly stem from differences in income and socio-economic status. In developing countries like Bangladesh, husband's occupation is closely associated with socio-economic status, which in turn is often related to husband's income. In general, the use of contraception tends to be high and fertility low among higher income occupations. However, among agrarian occupational groups, this relationship does not appear to hold. Land owning agriculturists have higher fertility rates than do sharecroppers and labourers.

Electricity

The 1985 CPS indicates that women living in households having electricity and in localities with electricity have lower fertility than women living in non-electrified households and localities. The TMFR for respondents with electricity in their households and localities is 4.6, while for non-electrified households and localities the TMFR is 6.1 (Table 11).

Data on cumulative fertility in 1985 indicate that women living in households and localities with electricity have, on average, fewer live births than women living in households not having electricity that are in localities with electricity. In addition, women living in households not-having electricity but in localities with electricity have, on average, similar numbers of live births as women living in households and localities not having electricity (Table-12).

Fertility differentials by availability of electricity arise because electricity itself is an index of modernity and households/localities having electricity are indicative of higher socio-economic status. The electrification differentials reported for 1985 tend to confirm an inverse association between socio-economic status and fertility.

Current Use of Contraception

According to the 1985 CPS, women using modern contraceptive methods have a TMFR of 2.3, women using traditional methods have a TMFR of 3.9 and those not-using any contraceptive method have a TMFR of 6.9. A similar pattern is found with respect to current use status in the 1983 CPS.

MASFRs for women using modern contraceptive methods are lower than among women using traditional methods, which

are in turn lower than rates for women not using any contraceptive method. This MASFR pattern is observed in 1983 and 1985 CPS data for all ages except the age groups 15-19 and 45-49. The exceptions may be due to the low cell frequencies in these two age groups (see Table 13).

Data on cumulative fertility in the 1985 CPS shows that the number of live births, on average, is lower among women who did not use any contraceptive method, followed by those using modern methods and those using traditional methods. It is not surprising that women already having a large number of children are more likely to use contraceptive methods than those having relatively few children. However, it is important to note that the number of live births is, on average, lower for women not using contraceptives below age 25 years and for women using modern methods who are 25 years and above (Table 14). Results also indicate that fertility differentials by current use status are larger between women using traditional methods and not using any contraceptive method than between women using modern and traditional methods.

Current fertility differentials by contraceptive use status arise because users are more likely to have fewer children than non-users and, among contraceptive users, modern method users are more likely to have fewer children than users of traditional methods since modern methods are more effective in limiting and spacing child births.

Desire for Additional Children

1985 CPS data allow for the examination of relationships between desire for additional children and fertility. This analysis shows that women desiring more children have a TMFR of 8.0, women undecided about having additional children have a TMFR of 8.6 and women having no desire for additional children have a TMFR of 6.0 (Table 15).

If data on cumulative fertility in the 1985 CPS is considered, women with no desire for additional children have, on average, 4.6 live births, women desiring additional children have 3.2 live births, and women uncertain/undecided about having children have 4.5 live births (Table 16). This finding is not unexpected given the socio-cultural factors prevailing in Bangladesh since women continue to desire children if they have not attained their desired parity.

Fertility differentials by desire for children are partly determined by the fact that women with no desire for children use contraceptive methods to limit fertility while women desiring additional children tend not to employ any contraceptive method (and if they do use contraception, often space rather than limit births).

Land Ownership

1983 and 1985 CPS data show that there is no discernible relationship between fertility and land ownership. The TMFR for women belonging to households owning land is nearly identical with that of women belonging to households that did not own land. This was true for both 1983 and 1985 CPS data (Table-2.9a).

Data on cumulative fertility in the 1985 CPS show little variation in the mean number of children ever born among women belonging to households with and without land ownership. This finding was also valid for cumulative fertility levels observed in 1983 CPS data (Table-2.9b).

Other studies investigating fertility and land ownership in Bangladesh have generated inconclusive findings. Stoeckel and Chowdhury (1969) found a negative relationship between fertility and landholding on the basis of data from 20 villages of Comilla-Kotwali thana. Cain (1978), in analysing data from a Bangladesh village, showed that large landholders had only slightly more live births compared to landless households. Khan (1981) obtained an inverse relationship between landholding and fertility. Latif and Chowdhury (1978) reported mixed results; a significant positive relation between fertility and landholding in one study area but no such relation in another region. Khuda (1985a; 1985b) found inconclusive relationships between landholding and fertility in two study areas.

Previous research studies have often hypothesized that households owning land should have higher per-capita income than those owning no land. Women belonging to households that own land are expected to have lower fertility since a negative relationship between fertility and per-capita income is more generally encountered (World Bank, 1974:147-148). Unfortunately, fertility differentials by land ownership could not be examined in any detail since 1985 CPS data on landholding are available simply in terms of whether an eligible woman belongs to a landowning or landless household. No information is available on the amount of land owned by the household.

Employment Status

According to the 1985 CPS, employed women have lower fertility than unemployed women. The TMFR for employed women is 4.8, while unemployed women have a TMFR of 5.8. In 1983, the TMFR for employed women is 5.2 and for unemployed women 5.9 (Table 19).

Data on cumulative fertility in the 1985 CPS show that employed women have fewer live births than unemployed women. This pattern is valid for cumulative fertility in the age groups 25-44 years. A similar relationship is observed for cumulative fertility in 1983 (Table 20). Differentials in TMFR with respect to women's employment status were more pronounced in 1985 than in 1983.

The finding that employed women have lower fertility than unemployed women is supported by Chowdhury (1974). Measuring fertility in terms of the child-women ratio, he found a significant inverse relationship between fertility and female labour force participation. 1975 BFS data showed that women who had ever worked outside the home for economic reasons consistently had a lower mean number of live births (3.6) than women who did not work (4.0) (GOB, 1978). Rahman and Ghani (1985), in a study of garment industry workers, found that provision of employment opportunities to illiterate and semi-educated women not only increases their household income but also encourages the use of contraception.

Fertility differentials based upon wife's employment status may be attributable to the following factors. Work outside the home delays marriage and also increases the chance of non-marriage for some women due to an increase in economic self-sufficiency (Chowdhury, 1977; Dube, 1974; United Nations, 1975). Employment provides satisfaction that can serve as an alternative to childbearing. In addition, a working women, by attaining economic independence, does not have to depend on her children for economic security in old age. Finally, a working wife, by being an earning member of the family, improves her status and finds greater opportunity to participate in family decision-making and increase husband-wife communication. With greater joint husband-wife participation in decision-making, the use of contraceptive methods tends to be higher and fertility lower (Chowdhury, 1976).

Only 6 percent of eligible women in the 1985 CPS, as opposed to 11 percent in the 1983 CPS, are employed. Employment is defined in both surveys to include those women having only paid employment (paid in either cash or kind). All women having unpaid employment and those who are reported to be unemployed are included in the unemployed category. Hence, in Bangladesh the small proportion of eligible women having paid employment are either (1) extremely poor and have to supplement their family income by their earnings or (2) better educated women concentrated mainly in urban and semi-urban areas. Perhaps because of these factors, the observed relationship between fertility and employment status is not straight-forward. More importantly, it is not possible to undertake an analysis of fertility differentials among different occupational groups because neither the 1983 nor 1985 CPS provide data on the occupational composition of employed women.

CONCLUDING REMARKS

Socio-economic differentials in fertility have been examined using 1983 and 1985 CPS data. Fertility differentials tend to be more pronounced in the case of current rather than cumulative fertility. Findings indicate an inverse relationship between fertility and the level of education for respondents and respondent's husbands. Fertility is lower among urban women than among rural women; lower among non-Muslim than Muslim women; and lower among women having paid employment than among those who are unemployed. Furthermore, fertility is lower among women using modern contraceptive methods compared to those using either traditional methods or no contraception. Results also reveal that fertility is lower for women living in households/localities with electricity, lower among women having no desire for additional children, and lower among women with husbands having white collar jobs.

This differential analysis suggests certain polices to be implemented to reduce fertility. In the short run, adequate measures should be undertaken to increase the contraceptive prevalence rate among eligible couples, particularly an increase in the prevalence rate for modern methods. In the long run, the following measures may be undertaken: (a) upgrading average educational attainment levels from no schooling to primary schooling, and from primary schooling to secondary schooling for males and females; (b) extension of the rural electrification

programme; (c) strengthening and extending IEM activities of the family planning programme and MCH activities so as to lower fertility and mortality and thereby reduce the desire for additional children; and (d) creating employment opportunities for illiterate and semi-educated women in non-agricultural occupations.

Table 1

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age, by Rural-Urban Areas in Bangladesh, 1983 and 1985

Age group	Rural		Urban	
	1983	1985	1983	1985
15-19	258 (1401)	256 (1166)	265 (136)	259 (355)
20-24	283 (1445)	283 (1450)	290 (162)	250 (516)
25-29	250 (1328)	225 (1394)	211 (175)	141 (560)
30-34	202 (892)	179 (1066)	189 (95)	122 (409)
35-39	125 (714)	132 (806)	125 (80)	108 (278)
40-44	63 (522)	61 (570)	19 (54)	35 (143)
45-49	9 (457)	27 (475)	0 (39)	27 (112)
TMFR	6.0	5.8	5.5	4.7

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 2

Mean Number of Children Everborn Per Currently Married Woman by Rural-Urban Area and Age Group in Bangladesh, 1983 and 1985

Age group	Rural		Urban	
	1983	1985	1983	1985
15-19	0.9 (1401)	0.8 (1166)	0.9 (136)	0.8 (355)
20-24	2.4 (1446)	2.2 (1450)	2.1 (162)	2.0 (516)
25-29	4.0 (1329)	3.8 (1394)	3.6 (175)	3.3 (560)
30-34	5.7 (892)	5.3 (1066)	5.2 (95)	4.7 (409)
35-39	6.8 (714)	6.7 (806)	6.2 (80)	6.2 (278)
40-44	7.7 (522)	7.7 (570)	7.9 (54)	7.4 (143)
45-49	7.9 (457)	7.7 (475)	6.1 (39)	7.7 (112)
Mean	4.1	4.1	3.7	3.8

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985,).
(ii) 1985 CPS.

Table 3

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age by Religion in Bangladesh, 1983 and 1985

Age group	Religion			
	Muslim		Non-Muslim	
	1983	1985	1983	1985
15-19	256 (1365)	268 (1154)	256 (172)	148 (128)
20-24	284 (1427)	280 (1468)	291 (179)	271 (151)
25-29	255 (1352)	226 (1395)	159 (151)	138 (182)
30-34	208 (854)	178 (1061)	144 (132)	132 (139)
35-39	120 (694)	139 (798)	172 (99)	50 (99)
40-44	57 (508)	63 (547)	88 (68)	33 (70)
45-49	7 (441)	29 (467)	18 (55)	7 (45)
TMFR	5.9	5.9	5.6	3.9

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 4

Mean Number of Children Everborn Per Currently Married Woman by Religion and Age Group in Bangladesh, 1983 and 1985

Age group	Religion			
	Muslim		Non-Muslim	
	1983	1985	1983	1985
15-19	0.9 (1365)	0.8 (1154)	0.9 (172)	0.7 (128)
20-24	2.4 (1428)	2.2 (1468)	2.1 (178)	2.0 (151)
25-29	4.0 (1353)	3.8 (1395)	3.5 (151)	3.3 (182)
30-34	5.7 (854)	5.3 (1061)	5.2 (132)	4.9 (139)
35-39	6.8 (694)	6.7 (798)	6.4 (97)	6.2 (99)
40-44	7.8 (508)	7.8 (547)	6.8 (68)	6.8 (70)
45-49	7.9 (441)	7.8 (467)	7.3 (55)	7.1 (45)
Mean	4.1	4.3	3.7	3.7

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 5

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age, by Education in Bangladesh, 1983 and 1985

Age group	Education					
	No Schooling		Primary Schooling		Secondary schooling & above	
	1983	1985	1983	1985	1983	1985
15-19	253 (1011)	278 (787)	281 (385)	221 (349)	228 (158)	221 (140)
20-24	280 (1011)	288 (1006)	301 (402)	279 (412)	272 (169)	236 (190)
25-29	244 (977)	237 (1066)	275 (353)	176 (338)	211 (152)	152 (163)
30-34	210 (713)	175 (836)	204 (211)	182 (267)	73 (55)	106 (88)
35-39	132 (562)	145 (667)	108 (194)	91 (175)	31 (32)	39 (51)
40-44	65 (449)	65 (491)	37 (108)	23 (102)	67 (15)	121 (19)
45-49	5 (400)	28 (435)	26 (77)	15 (65)	0 (12)	0 (11)
TMFR	5.9	6.1	6.2	4.9	4.4	4.4

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 6

Mean Number of Children Everborn Per Currently Married Woman, by Education and Age Group in Bangladesh 1983 and 1985

Age group	Education					
	No Schooling		Primary Schooling		Secondary schooling & above	
	1983	1985	1983	1985	1983	1985
15-19	0.9 (966)	0.8 (787)	0.9 (385)	0.7 (349)	0.8 (158)	0.5 (140)
20-24	2.5 (1011)	2.3 (1006)	2.4 (403)	2.3 (412)	1.7 (169)	1.6 (190)
25-29	4.1 (978)	3.8 (1066)	4.1 (353)	3.7 (338)	3.0 (152)	2.9 (163)
30-34	5.8 (713)	5.4 (836)	5.6 (211)	5.3 (267)	4.3 (55)	3.9 (88)
35-39	6.7 (562)	6.8 (667)	7.2 (194)	6.4 (175)	5.5 (32)	5.4 (51)
40-44	7.6 (449)	7.8 (491)	7.6 (108)	7.6 (102)	7.0 (15)	7.4 (19)
45-49	7.9 (400)	7.7 (435)	7.8 (77)	8.1 (65)	6.1 (12)	8.3 (11)
Mean	4.1	4.2	4.1	4.1	3.2	3.4

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 7

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age, by Education of Husband in Bangladesh, 1983 and 1985

Age group	Husband's Education						
	No Schooling		Primary Schooling		Secondary sch-ooling & above		Don't Know
	1983	1985	1983	1985	1983	1985	1983
15-19	257 (72[illegible])	247 (660)	231 (268)	282 (283)	253 (430)	252 (305)	303 (99)
20-24	281 (752)	265 (741)	291 (275)	341 (363)	284 (464)	251 (486)	300 (100)
25-29	250 (709)	235 (770)	219 (265)	204 (334)	243 (412)	192 (447)	295 (95)
30-34	197 (482)	171 (583)	232 (198)	184 (283)	161 (217)	139 (310)	250 (72)
35-39	123 (390)	151 (454)	181 (155)	116 (215)	86 (175)	106 (208)	117 (60)
40-44	74 (309)	65 (323)	40 (108)	65 (142)	47 (106)	44 (137)	20 (50)
45-49	8 (253)	31 (268)	9 (109)	17 (133)	0 (88)	34 (89)	23 (44)
TMFR	6.0	5.8	6.2	6.0	5.4	5.1	6.5

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 8

Mean Number of Children Everborn Per Currently Married Woman, by Husband's Education and Age Group in Bangladesh, 1983 and 1985

Age group	Husband's Education: No Schooling		Primary Schooling		Secondary schooling & above		Don't Know
	1983	1985	1983	1985	1983	1985	1983
15-19	0.9 (725)	0.8 (660)	0.9 (268)	0.9 (283)	0.9 (430)	0.6 (305)	1.1 (99)
20-24	2.4 (753)	2.2 (741)	2.6 (275)	2.4 (363)	2.2 (464)	2.0 (486)	2.4 (100)
25-29	4.1 (710)	3.8 (770)	4.1 (265)	3.8 (334)	3.7 (412)	3.5 (447)	3.9 (95)
30-34	5.6 (482)	5.3 (583)	6.1 (198)	5.4 (283)	5.4 (217)	5.0 (310)	5.7 (72)
35-39	6.7 (390)	6.8 (454)	6.9 (155)	6.6 (215)	6.6 (175)	6.4 (208)	6.7 (60)
40-44	7.7 (309)	7.7 (323)	7.9 (102)	8.1 (142)	7.9 (103)	7.1 (137)	6.6 (50)
45-49	7.8 (253)	7.7 (268)	8.1 (109)	7.6 (133)	7.6 (88)	7.9 (89)	8.2 (44
Mean	4.1	4.1	4.2	4.2	3.8	3.9	4.0

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 9

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age by Occupation of Husband in Bangladesh, 1985

Age group	Agricul-turist	Share cropper	Labour	Busi-ness men	White co-llar job Holder	Other
15-19	265 (402)	235 (114)	248 (372)	292 (180)	199 (152)	334 (61)
20-24	284 (463)	334 (157)	259 (438)	285 (239)	234 (242)	379 (81)
25-29	237 (484)	236 (110)	218 (423)	192 (236)	161 (252)	294 (73)
30-34	172 (358)	119 (101)	186 (311)	203 (159)	159 (197)	167 (74)
35-39	133 (305)	93 (76)	172 (236)	116 (106)	92 (127)	57 (47)
40-44	59 (244)	52 (58)	51 (118)	91 (66)	59 (79)	51 (52)
45-49	15 (216)	25 (40)	51 (104)	0 (54)	56 (53)	30 (44)
TMFR	5.8	5.5	5.9	5.9	4.8	6.6

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Agriculturist: Owns land, cultivated by himself and others
Sharecropper : Cultivates other's land on share basis
Labour : Agricultural landless labour plus day labourer
Businessmen : Businessmen and small traders
White Collar Job : Government service, private service, teachers, professionals like advocates, engineers, diploma engineers, doctors, technicians,
Others : Unemployed/retired persons, other professionals like weavers, fishermen, barbers, tailors, blacksmiths, and others
Source : 1985 CPS

Table 10

Mean Number of Children Everborn Per Currently Married Woman, by Occupation of Husband and Age Group in Bangladesh, 1985

Age group	Agricul-turist	Share cropper	Labour	Busi-ness men	White co-llar job Holder	Other
15-19	0.7 (402)	0.8 (114)	0.8 (372)	0.8 (180)	0.6 (152)	0.8 (61)
20-24	2.2 (463)	2.3 (157)	2.3 (438)	2.1 (239)	1.9 (242)	2.3 (81)
25-29	3.8 (484)	3.7 (110)	3.7 (423)	3.7 (236)	3.4 (252)	3.6 (73)
30-34	5.4 (358)	5.2 (101)	5.4 (311)	5.3 (159)	4.8 (197)	5.3 (74)
35-39	6.9 (305)	6.9 (76)	6.6 (236)	6.4 (106)	6.2 (127)	6.2 (47)
40-44	7.8 (244)	7.4 (58)	7.6 (118)	8.4 (66)	7.3 (79)	7.5 (52)
45-49	7.7 (216)	8.2 (40)	7.7 (104)	8.3 (54)	7.3 (53)	7.5 (44)
Mean	4.1	4.1	4.1	4.1	3.7	4.0

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Agriculturist: Owns land, cultivated by himself and others
Sharecropper : Cultivates other's land on share basis
Labour : Agricultural landless labour plus day labourer
Businessmen : Businessmen and small traders
White Collar Job : Government service, private service, teachers, professionals like advocates, engineers, diploma engineers, doctors, technicians,
Others : Unemployed/retired persons, other professionals like weavers, fishermen, barbers, tailors, blacksmiths, and others
Source : 1985 CPS

Table 11

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age by the Household/Locality Having Electricity or Not in Bangladesh, 1985

Age group	Household having electricity/locality having electricity	Household Not having electricity/locality having electricity	Neither household nor locality has electricity
15-19	289 (140)	264 (222)	249 (921)
20-24	242 (230)	287 (286)	285 (1103)
25-29	138 (205)	164 (265)	242 (1107)
30-34	129 (152)	174 (250)	181 (798)
35-39	73 (117)	89 (164)	150 (616)
40-44	19 (70)	35 (114)	72 (432)
45-49	23 (71)	12 (85)	32 (356)
TMFR	4.6	5.1	6.1

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 12

Mean Number of Children Everborn Per Currently Married Woman by the Household/Locality Having Electricity or Not by Age Group in Bangladesh, 1985

Age group	Household having electricity/locality having electricity	Household Not having electricity/locality having electricity	Neither household nor locality has electricity
15-19	0.7 (140)	0.8 (222)	0.8 (921)
20-24	1.9 (230)	2.3 (286)	2.2 (1103)
25-29	3.3 (205)	3.8 (265)	3.8 (1107)
30-34	4.8 (152)	5.5 (250)	5.3 (798)
35-39	6.1 (117)	6.6 (164)	6.8 (616)
40-44	7.2 (70)	7.8 (114)	7.7 (432)
45-49	8.0 (71)	7.5 (85)	7.7 (356)
Mean	3.8	4.1	4.1

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 13

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age, by Current Use Status in Bangladesh, 1983 and 1985

Age group	Current use status: Modern method		Traditional Method		Non-users	
	1983	1985	1983	1985	1983	1985
15-19	178 (90)	208 (75)	265 (49)	146 (43)	260 (1398)	263 (1164)
20-24	113 (213)	128 (258)	273 (77)	212 (93)	311 (1316)	315 (1268)
25-29	69 (289)	48 (423)	107 (75)	110 (106)	298 (1139)	294 (1049)
30-34	42 (192)	38 (318)	113 (71)	129 (109)	249 (723)	235 (773)
35-39	39 (153)	38 (210)	50 (80)	54 (99)	157 (560)	174 (588)
40-44	14 (74)	9 (106)	28 (36)	65 (57)	69 (466)	70 (455)
45-49	25 (40)	0 (48)	59 (17)	69 (29)	5 (439)	28 (435)
TMFR	2.4	2.3	4.5	3.9	6.7	6.9

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Modern Methods - Oral Pill, Condom, Vaginal Method, Injection, IUD Tubectomy and Vasectomy

Traditional Methods - Safe Period, Withdrawal, Abstinence, and Other

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 14

Mean Number of Children Everborn Per Currently Married Woman, by Current Use Status and Age Group in Bangladesh, 1983 and 1985

Age group	Current use status: Modern method		Traditional Method		Non-users	
	1983	1985	1983	1985	1983	1985
15-19	1.3 (90)	1.1 (75)	1.1 (49)	0.9 (43)	0.9 (1398)	0.7 (1164)
20-24	2.4 (213)	2.5 (258)	2.5 (77)	2.2 (93)	2.3 (1316)	2.1 (1268)
25-29	3.7 (289)	3.7 (423)	3.9 (75)	3.9 (106)	4.0 (1140)	3.7 (1049)
30-34	5.3 (192)	5.1 (318)	5.6 (71)	5.3 (109)	5.7 (723)	5.2 (773)
35-39	6.6 (153)	6.3 (210)	6.9 (80)	6.6 (99)	6.7 (560)	6.8 (588)
40-44	7.5 (74)	7.3 (106)	8.0 (36)	7.6 (57)	7.6 (466)	7.8 (455)
45-49	7.6 (40)	8.2 (48)	8.3 (17)	7.8 (29)	7.8 (439)	7.7 (435)
Mean	4.0	4.1	4.2	4.1	4.0	4.1

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Modern Methods - Oral Pill, Condom, Vaginal Method, Injection, IUD Tubectomy and Vasectomy

Traditional Methods - Safe Period, Withdrawal, Abstinence, and Other

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 15

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age by the Desire for Children in Bangladesh, 1985

Age group	Desire for children	No desire for children	Not decided/ Uncertain
15-19	243 (1167)*	400 (75)	350 (40)
20-24	269 (1090)	295 (460)	340 (69)
25-29	247 (635)	181 (859)	329 (83)
30-34	233 (312)	146 (843)	250 (45)
35-39	212 (122)	109 (741)	274 (34)
40-44	240 (35)	47 (564)	111 (18)
45-49	161 (19)	22 (488)	61 (5)
TMFR	8.0	6.0	8.6

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 16

Mean Number of Children Everborn Per Currently Married Woman by the Desire for Children and Age Group in Bangladesh, 1985

(The Eligible Woman Sample)

Age group	Desire for children	No desire for children	Not decided/ Uncertain
15-19	0.7 (1167)*	1.7 (75)	1.2 (40)
20-24	1.8 (1090)	2.9 (460)	2.7 (69)
25-29	3.1 (635)	4.2 (859)	4.2 (83)
30-34	4.3 (312)	5.6 (843)	5.6 (45)
35-39	5.7 (122)	6.8 (741)	6.5 (34)
40-44	5.9 (35)	7.8 (564)	7.9 (18)
45-49	4.3 (19)	7.8 (488)	9.5 (5)
Mean	3.2	4.6	4.5

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 17

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age by Land Ownership in Bangladesh 1983 and 1985

Age group	Land Ownership			
	Ownland		Does not ownland	
	1983	1985	1983	1985
15-19	262 (1044)	248 (853)	243 (493)	271 (429)
20-24	290 (1076)	270 (1030)	272 (529)	296 (589)
25-29	252 (986)	222 (987)	237 (515)	205 (590)
30-34	183 (644)	175 (757)	234 (342)	170 (443)
35-39	126 (533)	134 (575)	123 (260)	120 (322)
40-44	56 (395)	67 (438)	67 (180)	41 (179)
45-49	3 (367)	23 (357)	23 (130)	36 (155)
TMFR	5.9	5.7	6.0	5.7

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 18

Mean Number of Children Everborn Per Currently Married Woman, by Land Ownership and Age Group in Bangladesh, 1983 and 1985

Age group	Land Ownership			
	Ownland		Does not ownland	
	1983	1985	1983	1985
15-19	0.9 (1044)	0.7 (853)	1.0 (493)	0.9 (429)
20-24	2.4 (1077)	2.1 (1030)	2.3 (529)	2.3 (589)
25-29	3.9 (987)	3.8 (987)	4.0 (515)	3.6 (590)
30-34	5.7 (644)	5.3 (757)	5.5 (342)	5.2 (443)
35-39	7.0 (533)	6.7 (575)	6.6 (260)	6.6 (322)
40-44	7.7 (395)	7.7 (438)	8.3 (180)	7.7 (179)
45-49	8.0 (367)	7.7 (357)	7.3 (130)	7.8 (155)
Mean	4.1	4.1	4.0	4.1

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 19

Age-Specific Fertility Rate Among Currently Married Women Under 50 Years of Age, by Employment Status in Bangladesh, 1983 and 1985

Age group	Employment Status			
	Employed		Unemployed	
	1983	1985	1983	1985
15-19	250 (80)	319 (39)	251 (1457)	254 (1244)
20-24	259 (147)	277 (90	286 (1459)	279 (1529)
25-29	234 (175)	123 (105)	248 (1328)	222 (1472)
30-34	183 (109)	135 (104)	201 (875)	177 (1096)
35-39	99 (71)	62 (54)	127 (723)	133 (843)
40-44	22 (46)	0 (32)	62 (529)	63 (585)
45-49	0 (35)	48 (21)	9 (460)	26 (491)
TMFR	5.2	4.8	5.9	5.8

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Khuda and Howlader (1985).
(ii) 1985 CPS.

Table 20

Mean Number of Children Everborn Per Currently Married Woman, by Employment Status and Age Group in Bangladesh, 1983 and 1985

Age group	Employment Status			
	Employed		Unemployed	
	1983	1985	1983	1985
15-19	0.9 (80)	0.9 (39)	0.9 (1457)	0.7 (1244)
20-24	2.3 (147)	2.2 (90)	2.4 (1460)	2.2 (1529)
25-29	3.8 (175)	3.4 (105)	4.0 (1329)	3.7 (1472)
30-34	5.1 (109)	4.9 (104)	5.7 (875)	5.3 (1096)
35-39	6.3 (71)	6.5 (54)	6.8 (723)	6.7 (843)
40-44	7.0 (46)	6.5 (32)	7.8 (529)	7.8 (585)
45-49	7.3 (35)	7.7 (21)	7.9 (460)	7.7 (491)
Mean	3.8	3.9	4.1	4.1

* Figures within the parenthesis are the number of currently married women.

(i) 118 cases in 1985 CPS data and 158 cases in 1983 CPS data are excluded from the table due to omission of age group <15.

Source: (i) Huda and Howlader (1985).
(ii) 1985 CPS.

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Chapter Three

DETERMINANTS OF CHILD MORTALITY IN BANGLADESH

Elizabeth Frankenberg and Khan Matin

INTRODUCTION

Chapter One discussed the difficulties of estimating levels of infant and child mortality in Bangladesh. These difficulties arise both from the variable quality of data and from the inability to apply methodologies robust to situations of changing fertility and mortality. Despite the inherent problems in measuring mortality, Chapter One calculated national level mortality estimates using the Trussell variant of the Brass childhood mortality method. Application of this technique yielded a q(2) estimate for the period 1982-1983 of .1889. This q(2) implies an infant mortality rate of about 140 and a life expectancy around 50 years.

Underlying the national figures for infant and child mortality are patterns of variation in mortality by various socio-economic and demographic characteristics. Chapter Three uses data from the 1985 Contraceptive Prevalence Survey to explore these patterns. Individual characteristics considered include the respondent's religion, educational level, employment status, current use of contraception, and desire for additional children. Education of the respondent's spouse is also analyzed. At the household level characteristics of interest are land ownership, place of residence (urban and rural), and electrification.

METHODOLOGY

This paper uses a Child Mortality Index to analyze differential mortality. The Child Mortality Index (CMI) is defined as the proportion of children ever born that have died. For each respondent who has had at least one live birth, the CMI is calculated by dividing the total number of dead children by the total number of children ever born. For a group of women sharing some characteristic, a summary measure of mortality associated with that characteristic may then be calculated by averaging the CMIs of the individuals. For example, one may analyze the effect of religion on child mortality by comparing the average CMI of Muslim respondents to the CMI of non-Muslim respondents.

One obvious problem with the CMI is that its value is largely dependent on age of the mother. The older a woman,

the older her children and the longer those children have been exposed to risks of mortality. Clearly, in analyzing differential mortality by comparing CMIs for various characteristics, one must control for the effect of age. In this analysis, women are subdivided into three age groups: age less than 25, age 25 to 34, and age greater than 34. Then, for every category of each characteristic, an average CMI for each of the three age groups is calculated. This procedure has been employed for all of the characteristics of interest. Results may be found in Tables 1 through 10.

Small cell frequencies in certain tabulations pose an additional problem in interpreting CMI differentials. In these tabulations, CMI differentials may be unstable and should be interpreted with caution.

In addition to bivariate analysis, this analysis uses multivariate regression to examine the combined effect of socio-economic and demographic variables in explaining levels of mortality. The regression equation, which uses the proportion of children ever born that have died as the dependent variable, is estimated for the national CPS sample.

THE STUDY POPULATION

The respondents interviewed in the 1985 CPS Eligible Woman Sample were ever-married women under 50 years of age. Only 30.3% of the respondents in the sample had attended any school and only 6.9% were employed at the time of the interview. About one third of the respondents came from families that did not own land. Similarly, about one third of the respondents were ever users of contraception. For the respondents who were currently married at the time of the interview, 29.8% were using contraception (Mitra and Associates, 1987).

Use of the child mortality index and analysis of mortality variations among users and nonusers of contraception made it necessary to partition the sample. Only women who had at least one live birth and were eligible for contraceptive use (currently married women) were included. After removal of women not meeting these requirements, eligible respondents in the weighted national sample numbered 6,818.

BIVARIATE ANALYSIS OF DIFFERENTIAL MORTALITY

Bivariate results are presented in Tables 1 through 10 for both the 1983 and 1985 CPS. In each table women are divided into three age groups and into categories relevant to the particular variable in question. Each cell contains the

average proportion of children ever born that have died and the number of observations from which the proportion is derived (in parentheses).

Educational Attainment

Research in developing countries has documented an inverse relationship between level of child mortality and level of parental education (Caldwell, 1979; Preston, 1978; Cochrane, 1980). Despite accumulating international evidence that parental education reduces child mortality, research in Bangladesh has not conclusively established this inverse relationship. For example, in a multivariate analysis Chowdhury (1981) found weak relationships between socio-economic status and neo-natal and infant mortality in Matlab. Similarly Phillips and Mazumder (1984), estimating a logistic regression model from data from four thanas, found a negative but insignificant relationship between mother's education and child mortality. The lack of relationship may result from the presence of other variables that serve as proxies for education. In contrast to the findings mentioned above, D'Souza (1982) found lower child mortality rates with increasing education of both mothers and heads of households.

Table 1 presents the CMI by age of mother and husband's education as reported by the 1983 and 1985 CPS. In 1983 the CMI declines by level of husband's education within all three respondent age catagories. A strong negative association between the CMI and husband's educational attainment is also evident in 1985. For the youngest group of respondents (aged 15-24), women with husbands that have some primary school education have a slightly higher proportion of dead children (16.5 percent) than do respondents with illiterate husbands (16.0 percent). However, for all other ages and educational levels, the CMI decreases with increasing paternal education.

Table 2 shows the impact of maternal education on CMI. The effect of mother's education in lowering the CMI is even more dramatic than that of father's education. In 1983 the CMI among illiterate women ranged from 18.2 percent for the youngest age group to 26.0 for the oldest age group. The CMI range among secondary school graduates was much lower (from 9.5 for the youngest age group to 14.5 for the oldest age group). The 1985 results are the same. For illiterate women the CMI is smallest for women 15 to 24 (16.1 percent) and largest for women 35 to 49 (25.2 percent). The CMI decreases with education to a range of 10.8 percent (15-24 age group) to 13.7 percent (35-49 age group). These findings strongly suggest that female secondary education is more critical than male secondary schooling in reducing child mortality.

Residence

Differential mortality by urban-rural residence is another phenomenon widely observed in the developing world (Mitra, 1979; Ruzicka, 1983). Urban-rural variations in socio-economic status, access to health care, and environmental conditions may give rise to mortality variations by residence.

Table 3 illustrates the differences in CMI by age of mother and residence. In both 1983 and 1985, child mortality is lower in urban than in rural areas for all respondent age categories. In addition, age-specific urban/rural CMI differentials do not change between 1983 and 1985, which suggests that the differential pattern in the child mortality index is not increasing in magnitude over time.

Religion

The predominant religion in Bangladesh is Islam, practiced by 89.4 percent of the population (Mitra and Associates, 1987). Of the remaining 10.6 percent of the population, the majority are Hindu, with only a small representation of Christians and Buddhists.

Table 4 explores variation in child mortality by Muslim and Non-Muslim religious persuasion. The CMI in both 1983 and 1985 does not vary substantially by religion. Thus it appears that religion is unrelated to the level of the CMI.

Land Ownership

Bangladesh is primarily an agrarian nation, with 84.8 percent of its residents living in villages (Mitra and Associates, 1987). Most of these village residents work in jobs related to agriculture. Consequently, landownership is a sensitive indicator of economic status. Given the inverse relationship between economic status and child mortality, CMIs should vary with land ownership.

CMIs by age and land ownership are calculated separately for urban and rural samples. Though some urban residents do own land, differences in the proportion of families owning land by urban-rural residence is substantial. In the 1985 CPS, 64 percent of ever-married women living in rural areas come from families owning land. In contrast, only 44.5% of ever-married women living in urban areas come from families owning land (Mitra and Associates, 1987).

Table 5 shows CMIs for 1983 and 1985 by age, land-ownership, and residence. Differential patterns of child

mortality by age and land ownership are the same for rural and urban residents in both 1983 and 1985, but absolute levels of the CMI are quite different. In both rural and urban areas, families owning land have significantly lower CMIs than do families without land.

Landownership constitutes a rough measure of income and overall wealth status in Bangladesh. It is not surprising to find that respondents from poorer (landless) households have higher child mortality. What is somewhat remarkable is that CMI differentials by land ownership status in rural areas are not more pronounced. The implication of this finding is that the income status of households owning and not-owning land may not vary substantially for the majority of rural households. To assess this issue further, CMI differentials by size of landholding are required. This information was not collected in the 1985 CPS

Employment Status of Respondents

Bangladesh society is extremely conservative with respect to women's roles. A large number of women follow the practice of purdah, which prohibits working outside the home. Among women interviewed in the 1985 CPS, only 6.9 percent described themselves as currently employed (5.8 percent are paid for their work; 1.1 percent are unpaid). Women who are employed outside the home may fall into one of two categories: women who work because of economic necessity, and women who work for a source of pleasure or to achieve a higher standard of living (Ware, 1984).

Infant mortality by employment status of women could follow any of several patterns. If women's employment has a negative impact on child care or health during pregnancy, mortality will be higher among the children of working mothers. If the quality of child care does not suffer when mothers are employed, then child mortality should not vary with employment status of the mother. Another possibility is that women's employment status is associated with other socio-economic characteristics that produce variation in mortality rates, but that employment status by itself does not directly or indirectly cause these mortality variations. For example, the children of women working to stay above some absolute level of poverty may be exposed to poor personal hygiene and sanitation conditions and may have less access to health care, which in turn might lead to higher than average child mortality.

Table 6 examines CMI patterns by age and employment status in 1983 and 1985. Unemployed women have a lower CMI than employed women. The greatest variation occurs in

the youngest age group. Among employed women less than 25 years of age in 1985, 19.8 percent of children ever born have died. For unemployed women the figure is 14.6 percent. The difference narrows among women in the 25-34 year age group to 19.4 percent and 18.3 percent for employed and unemployed women respectively. In the oldest age group, the CMI is 26.8 percent for employed women and 23.6 percent for unemployed women.

Electrification of Household

Electrification of respondent's household is another socio-economic indicator of interest in Bangladesh. Previous research has explored the relationship between household electrification and fertility (Robinson, 1985) and has generally concluded that electrification is associated with lower fertility. The electrification of households is thought to be an important mechanism through which new ideas and modes of behaviour are inculcated in traditional societies (e.g. through radio and enhanced utilization of educational materials). In addition, electrification of households is thought to provide a reasonable measure of income distribution and overall socio-economic status. If electrification encourages the development of anti-natalist sentiment in traditional societies, it may also be the case that electrified households are associated with lower child mortality.

As with land ownership, the percentage distribution of respondents by electrification status differs for rural and urban residence. In urban areas, 68 percent of respondents live in homes with electricity, whereas in rural areas only 6.5 percent live in electrified homes.

Table 7 presents differentials in CMI by electrification status for urban and rural areas from the 1985 CPS (the 1983 CPS did not collect information on electrification). For both residence areas, the CMI is only slightly higher for respondents without electricity than for those with electricity. The differentials in urban and rural areas are roughly similar.

Parity and Current Use of Family Planning

Relationships between parity, current use of family planning, and the CMI are complicated by the effects of age. In Bangladesh there is a strong relationship between age and current use of family planning, with most current users above the age of 25 (Mitra and Associates, 1987). As with other variables, age effects are controlled by comparing mortality differentials by parity and current use for three age groups.

Before differential CMI's are reported, however, it is important to discuss the relationships between parity, child mortality, and contraceptive use.

An important dynamic in fertility and subsequent child mortality is the birth interval. Children born very close together in time (short birth intervals) are more likely to die than children whose births are spaced further apart (Nortman, 1978; Koenig, et al., 1986, Trussell and Pebley, 1986). A number of interrelated factors combine to raise the child mortality experience of women bearing many children close together in time. Babies born in these circumstances are more likely to compete with other siblings for food and attention, they are likely to be weaned early, and their mothers are more prone to experience complications of pregnancy and childbirth (Population Reports, 1984).

From this relationship, along with knowledge of nuptiality patterns in Bangladesh, one may construct expectations regarding differential mortality by parity. These expectations are based on two assumptions:

1) because age at marriage in Bangladesh is uniformly young, marriage durations are approximately equal within an age group;
2) knowledge of current age of a woman and her current parity gives a fairly good indication of the average interval between births in a population with relatively low contraceptive use.

If these two assumptions hold, which seems likely below age 35 in Bangladesh, then within age groups, we would expect women with higher parities to have shorter birth intervals and correspondingly higher CMIs than women of the same age with lower parities.

Table 8 shows CMIs by age and three parity categories (parity 1-2, 3-4, and 5+) in 1983 and 1985. As is readily apparent, the pattern of association between parity and CMI by age is similar in both years. For women under 25 in 1985, the CMI of mothers with five or more children is three times higher than it is for mothers with one or two children. For women 25-34, the CMI for mothers with five or more children is more than twice as high as it is for mothers with one or two children. High parity women have greater CMIs owing to their longer exposure to the risk of child mortality and shorter birth intervals.

Above age 35, the pattern of CMIs by parity is quite different. Women with three or four children have the lowest CMIs, followed by women with one or two children. Women of

parity five or more have the highest CMIs. Women with five or more children would be likely to have a relatively high CMI at any age given the postulated relationship between birth intervals and child mortality.

The high CMI for women older than 35 with parity 1-2 is somewhat curious. The low cell frequency for this category (N = 63 in 1983 and 60 in 1985) may be responsible for generating this result. However, it is also possible that older low parity women may be predisposed to higher child mortality. The child mortality risks associated with parity 1 are generally higher than for subsequent parities (Bongaarts, 1987). First babies are more likely to be born underweight and prematurely, which predisposes infants to greater mortality risk (Population Reports, 1984). Therefore, women aged 35+ with a high proportion of first parity offspring might be expected to have somewhat higher child mortality than women over 35 with three or four children.

In both 1983 and 1985, the CMI for women above age 35 with only 1-2 children is higher than among women of the same parity below age 35. Some older women may have lower average parities due to physiological factors that inhibit fecundity (e.g. poor nutritional status). These same factors may raise child mortality. Anemic women, for example, suffer more complications during pregnancy and childbirth, have more premature births, and experience greater perinatal loss than nonanemic women (Population Reports, 1981).

The relationships described above are ones in which a woman's parity relative to her age influences the mortality experience of her children. In countries like Bangladesh, where fertility is high, contraceptive prevalence relatively low, and breastfeeding duration long, a reverse relationship exists as well; namely, child mortality can effect fertility by shortening the birth interval.

When a child dies and breastfeeding stops, the ovulatory changes that accompany breastfeeding and reduce fecundity also cease. The mother's risk of conception then increases and on average the time to next birth is decreased (Huffman and Lamphere, 1984). As previously stated, babies born after short intervals experience greater mortality than babies born after longer intervals. Thus, when the death of one baby has the effect of shortening the interval to the birth of a second baby, that second baby has a lower probability of survival than if its sibling had survived, continued breastfeeding, and extended the birth interval by postponing conception (Population Reports 1984).

Given this relationship between birth intervals and child mortality, one would expect that women currently using contraception would have lower CMI's to the extent that current contraceptive use indicates efforts to space births and reduce high parity births (Population Reports, 1984). Table 9 shows the distribution of CMIs with regard to current use of family planning in 1983 and 1985. For each age group in both years, current users have lower CMIs than nonusers.

This pattern may result from the effect of contraception in lengthening birth intervals and reducing first births among young women and high parity births among older women (Population Reports, 1984). Another explanation is the association between contraceptive use, socio-economic status, and health-related behavior. If current users tend to be more educated, have greater access to family planning and health services, and generally come from higher socio-economic backgrounds than non-contraceptors, one would expect contraceptors to experience lower child mortality.

Children Wanted in Future

The final characteristic in the bivariate analysis is variation in CMI by desire for additional children. As can be seen in Table 10, 1983 and 1985 CMI patterns in relation to the desire for more children are quite similar. In each age group, women who desire more children have higher CMIs than women who do not want additional children.

MULTIVARIATE ANALYSIS OF CHILD MORTALITY

In addition to the bivariate examination of mortality differentials, this paper uses multivariate regression to assess the determinants of child mortality. This exercise examines the relative strength and patterns of association among socio-economic and demographic determinants of child mortality.

The dependent variable in the equation is the child mortality index. Independent variables are the number of children ever-born (TNCEB), educational level of the respondent (EDUC), employment status (EMP), land ownership (LAND), electrification of the household (ELEC), religion (RELIG), and current use of family planning (CUFP). Table 11 provides full definitions of these variables. Since age of the respondent and the total number of children ever-born are highly inter-correlated, the variable AGE was not included in the final equation employed to estimate the determinants of child mortality.

Results

Six variables are significant at the .01 level of significance. These variables are TNCEB, CUFPM, EDUC, LAND, EMP, and ELEC. The only variable not found to be significant was RELIG, which is consistent with findings presented in the preceding bivariate differential analysis.

Results confirm that higher parity women have greater child mortality. With each increase in parity, the proportion of children ever-born that have died rises by 2.2 percentage points. To a considerable extent, this association is a function of age; namely, as the number of children ever-born increases with the age of the respondent, so does a child's duration of exposure to the risk of mortality.

Table 11 also reports that current use of family planning is negatively related to the CMI in 1985. The CMI for women who are currently using contraception is, on average, 4.75 percentage points lower than for non-users. Women who are using contraception may tend to have longer birth intervals and fewer high risk births, and therefore may be likely to experience fewer child deaths. As noted previously, contraceptive users also tend to be from better socio-economic backgrounds, which reduces the risk of child mortality.

Respondent's level of educational attainment is negatively related to the CMI. This relationship is not unexpected, and can be explained by the fact that more highly educated women tend to delay their age at marriage and age at first birth, are often more knowledgeable concerning issues of child care (e.g, child nutrition, personal hygiene and sanitation), have greater access to primary and curative medical care and come from higher socio-economic backgrounds and are thus better able to provide for their children.

Despite the high proportion of women that do not work outside the home for cash or in-kind payment, results in Table 11 show that there is a significant positive relationship between CMI and employment. CMIs for employed women are, on average, 3.7 percentage points higher than among non-employed women. Possible interpretations of this finding are 1) women who work do so at the expense of the welfare of their children, and 2) women who work may be forced to do so by the poor economic circumstances of the household. Employed women may tend to be disproportionately

selected from very poor households that are at greater risk of experiencing a child death.

Two household status variables are also significant predictors of the CMI; namely, land ownership status and electrification of the household. The coefficients for both variables are negative. For households that own land, the proportion of children ever-born that have died is 2.08 percentage points lower than in households that do not own land. The CMI in electrified households is 2.77 percentage points lower than in non-electrified households. Both of these measures point to the importance of socio-economic status in predicting child mortality.

The results of this regression analysis largely confirm the relationships between child mortality and socio-economic characteristics of the mother that were identified in bivariate analysis. Parity and current employment of the respondent are positively related to child mortality while current use of family planning, education of the respondent, land ownership and household electrification are negatively related to the CMI.

Goodness of Fit

Table 11 includes two goodness of fit statistics for this model; namely, R =.103 and F = 129.8. The low value of R indicates that the model explains only a very small proportion of the variation in CMI. The F ratio is accompanied by a P value of 0.0. From this P value we can conclude that there is no possibility that the distribution of CMIs by the variables examined could have occurred by chance.

The low R value of the model is cause for some concern. This result may be partly due to the large number of binary variables included in the equation. In any case, the low R values indicate the need for continued research on differential mortality in Bangladesh.

CONCLUSIONS

The bivariate and multivariate analyses of child mortality in Bangladesh provide information on patterns underlying national level mortality estimates of Chapter One. Child mortality in Bangladesh varies both with socio-economic status of the child's household and with demographic characteristics of the child's mother.

In Bangladesh, as in many other developing nations, children from high socio-economic backgrounds experience

lower mortality than children from low socio-economic environments. Variables considered in reaching this conclusion are religion, employment status, educational level, rural-urban residence, land ownership, and electrification status.

Of these variables, religion is the only indicator that does not have a strong pattern of association with mortality. Increasing educational levels for both respondents and spouses are strongly and negatively related to the CMI. Current employment of the respondent is positively related to the CMI. Urban residents have lower CMIs than rural residents. In both rural and urban areas, land ownership is negatively associated with the CMI. Household electrification is also negatively related to CMI in both rural and urban areas.

The relationships between CMI and the socio-economic variables considered are not surprising. As socio-economic status rises, knowledge of and access to family planning and health facilities increases. Similarly, higher socio-economic status is associated with improved personal hygiene, nutritional status, and household sanitation, all of which may serve to reduce child mortality.

The positive relationship between CMI and employment is consistent with bivariate results. Given the conservative attitudes towards women's roles in Bangladesh, a possible explanation is that most women who work do so because they have no other means of avoiding absolute poverty. The children of these destitute women may then be exposed to disadvantages that accompany low economic standing and result in higher mortality.

Demographic variables considered in the analyses are parity of the mother, current use of contraception, and desire for additional children The CMI is positively related to parity for most age groups. This relationship is partly dependent on the association between mother's age, parity, and the interval between births. Current use of family planning is negatively related to the CMI. The positive relationship between desire for additional children and CMI is intuitively obvious; mothers who have experienced a child death are less likely to have attained their desired family size and therefore are more inclined to want additional children.

Table 1: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Educational Level of Husband

Age Group	Educational Level of Husband			
	Illiterate	Primary	Secondary	College/Univ
	CMI (n)	CMI (n)	CMI (n)	CMI (n)
1983 CPS				
15-24	18.6 (1186)	15.0 (423)	14.1 (490)	10.0 (197)
25-34	21.4 (1167)	20.8 (456)	16.8 (437)	7.7 (174)
35-49	27.2 (937)	23.4 (362)	20.9 (314)	11.1 (47)
1985 CPS				
15-24	16.0 (1043)	16.5 (500)	12.8 (413)	7.8 (157)
25-34	20.7 (1313)	19.2 (601)	14.2 (534)	9.5 (209)
35-49	26.5 (1030)	23.4 (484)	18.6 (366)	13.2 (67)

Table 2: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Educational Level of Respondent

Age Group	Educational Level of Respondent			
	Illiterate	Primary	Secondary	College/Univ
	CMI (n)	CMI (n)	CMI (n)	CMI (n)
1983 CPS				
15-24	18.2 (1568)	15.1 (630)	9.5 (223)	4.4 (17)
25-34	20.9 (1661)	17.9 (555)	10.0 (159)	2.4 (36)
35-49	26.0 (1390)	22.5 (373)	14.5 (54)	6.8 (4)
1985 CPS				
15-24	16.1 (1372)	13.3 (564)	10.8 (190)	2.7 (16)
25-34	20.3 (1850)	15.3 (592)	10.3 (204)	6.1 (41)
35-49	25.2 (1571)	19.4 (340)	13.7 (69)	14.0 (13)

Table 3: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Place of Residence

Age Group	Residence	
	Urban CMI (n)	Rural CMI (n)
1983 CPS		
15-24	12.9 (670)	17.0 (2250)
25-34	15.2 (757)	19.8 (2175)
35-49	20.[illegible] (494)	25.4 (1665)
1985 CPS		
15-24	11.2 (657)	15.2 (1941)
25-34	14.2 (938)	18.8 (2398)
35-49	19.9 (526)	24.1 (1831)

Table 4: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Religion

Age Group	Religion	
	Muslim	Non-Muslim
	CMI (n)	CMI (n)
1983 CPS		
15-24	16.6 (2211)	16.5 (271)
25-34	19.4 (2164)	18.1 (274)
35-49	24.9 (1617)	25.8 (217)
1985 CPS		
15-24	15.0 (1952)	14.0 (205)
25-34	18.4 (2392)	17.4 (313)
35-49	23.8 (1793)	23.6 (210)

Table 5: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Land Ownership

Age Group	Land Ownership Status			
	Urban		Rural	
	Yes	No	Yes	No
	CMI (n)	CMI (n)	CMI (n)	CMI (n)
1983 CPS				
15-24	11.8 (343)	14.0 (326)	16.8 (1534)	17.6 (715)
25-34	12.7 (343)	17.2 (413)	19.0 (1477)	21.4 (696)
35-49	19.0 (214)	21.1 (279)	24.3 (1201)	28.3 (463)
1985 CPS				
15-24	10.1 (322)	12.3 (335)	15.1 (1239)	15.6 (702)
25-34	11.3 (435)	16.8 (503)	17.9 (1559)	20.5 (839)
35-49	17.6 (202)	21.4 (323)	22.3 (1288)	28.6 (543)

Table 6: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Employment Status

Age Group	Employment Status	
	Employed	Unemployed
	CMI (n)	CMI (n)
1983 CPS		
15-24	21.1 (149)	16.3 (2334)
25-34	18.5 (239)	19.4 (2197)
35-49	26.6 (127)	24.7 (1708)
1985 CPS		
15-24	19.8 (108)	14.6 (2049)
25-34	19.4 (201)	18.2 (2504)
35-49	26.8 (105)	23.6 (1898)

Table 7: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Electrification Status

Age Group	Electrification Status			
	Urban		Rural	
	Yes	No	Yes	No
	CMI (n)	CMI (n)	CMI (n)	CMI (n)
1985 CPS				
15-24	11.1 (596)	11.9 (61)	12.9 (463)	15.9 (1478)
25-34	14.2 (884)	14.1 (54)	18.6 (557)	18.8 (1841)
35-49	19.6 (484)	23.6 (42)	22.2 (455)	24.8 (1376)

Table 8: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Parity Level

Age Group	Parity Level of the Respondent		
	1-2	3-4	5+
	CMI (n)	CMI (n)	CMI (n)
1983 CPS			
15-24	14.0 (1696)	21.1 (706)	31.9 (80)
25-34	12.7 (312)	14.7 (841)	23.8 (1284)
35-49	24.6 (63)	22.3 (165)	25.2 (1809)
1985 CPS			
15-24	11.3 (1510)	21.7 (571)	33.0 (76)
25-34	10.5 (420)	14.7 (1040)	24.0 (1245)
35-49	21.4 (60)	15.7 (219)	25.0 (1725)

Table 9: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Current Use of Family Planning

Age Group	Current Use of Family Planning	
	Yes	No
	CMI (n)	CMI (n)
1983 CPS		
15-24	10.0 (389)	16.6 (1706)
25-34	14.6 (624)	20.6 (1494)
35-49	20.8 (401)	26.1 (1344)
1985 CPS		
15-24	10.9 (424)	14.6 (1498)
25-34	14.9 (950)	19.8 (1495)
35-49	19.1 (547)	25.8 (1360)

Table 10: Child Mortality Index (Percent of Children Ever Born Dead) By Age and Desire for Additional Children

Age Group	Desire for Additional Children	
	Yes	No
	CMI (n)	CMI (n)
1983 CPS		
15-24	15.0 (1658)	11.5 (590)
25-34	21.8 (813)	17.0 (1473)
35-49	30.2 (158)	24.0 (1630)
1985 CPS		
15-24	14.2 (1480)	10.1 (532)
25-34	20.4 (861)	16.5 (1701)
35-49	29.4 (150)	23.2 (1791)

Table 11: Analysis of the Child Mortality Index (Proportion of Children Ever-Born that have Died) by Current Use of Family Planning, Total Number of Children Ever-Born, Educational Attainment, Land Ownership, Religion, Employment, and Electrification Status

Dependent Variable - CMI

Independent Variables

	B	BETA	SE	T	SIGNIFICANCE OF T VALUE
TNCEB	.02212	.27615	.00094	23.502	.0000*
CUFP	-.04754	-.09334	.00600	-7.922	.0000*
EDUC	-.00588	-.06130	.00123	-4.748	.0000*
LAND	-.02080	-.04365	.00568	-3.662	.0003*
EMP	.03709	.03831	.01132	3.276	.0011*
ELEC	-.03773	-.03977	.00867	-3.200	.0014*
RELIG	-	-	-	-.794	.4271
(Constant)	.13694	-	.00759	18.034	.0000

* - Significant at the .01 level

Summary Measures for Equation

Multiple R = .32197 F = 128.84

R^2 = .10366 P = 0.0

SE = .21636 N = 6742

Table 11 (Continued)

Variable Definitions

TNCEB - Total Number of Children Ever-Born
(Continuous Variable)

CUFP - Current Use of Family Planning
(Yes = 1, No = 0)

EDUC - Education of the Respondent
No schooling = 0
Some Primary (<1-4 Years) = 2.5
Completed Primary (5 years) = 5
Lower Secondary (6-7 years) = 6.5
Upper Secondary (8-9 years) = 8.5
College/University (10-12 years) = 11

LAND - Landownership Status of the Family
(Owning Land = 1, Not Owning Land = 0)

EMP - Employment Status of the Respondent
(Employed = 1, Not Employed = 0)

ELEC - Electrification Status of the Household
(Electrified = 1, Not Electrified = 0)

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Chapter Four

UNMET CONTRACEPTIVE NEED AND REASONS FOR NON-USE

Barkat-E-Khuda and Sushil Ranjan Howlader

1. INTRODUCTION

Despite the almost universal awareness of family planning in Bangladesh and given that the organized family planning movement dates back to the early 1960s, contraceptive prevalence remains at a relatively low level of 29.8 percent (Mitra and Associates, 1987). In view of this, two significant policy issues are examined in this chapter: the unmet contraceptive need (UCN) and the reasons for non-use of family planning. Data from the 1985 CPS are used for the analysis. Section 2 of this paper defines the concept of UCN, measures the extent of UCN, and examines the differentials in UCN by selected characteristics of the respondents. Section 3 examines the reasons for non-use and related differentials, and also examines the importance of "desire for additional children" as the major reason for non use. Section 4 summarizes the paper and puts forth some of the programmatic and policy implications.

2. UNMET CONTRACEPTIVE NEED

2.1 The Concept

The term "UCN" is conventionally defined as the percentage of currently married women in their reproductive ages, who (i) do not want any more children, and (ii) are not contracepting (Measure 1), (Westoff, 1978; Westoff and Pebley, 1982; Mitra and Pebley, 1982; Hatmadji and Pebley, 1982; Rahman and Pebley, 1982; Regrie, 1982; Khuda and Howlader, 1986a). Several modifications are generally applied to the concept. The first modification confines analysis to currently married non-pregnant women (Measure 2). The second specification limits analysis to currently married, non-pregnant, and non-breastfeeding (1) women (Measure 3).

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1. The 1985 CPS did not collect information relating to the duration and extent of breastfeeding. Information on breastfeeding was derived from the question relating to reasons for non-use, and breastfeeding was given as one of the reasons.

An additional modification limits analysis to currently married, non-pregnant, non-breastfeeding, and fecund (1) women (Measure 4).

Regarding the practice of family planning, we have considered: (a) those not practising any FP method, i.e. neither modern nor traditional methods (Measure 1 through 4), and (b) those not practising any modern method, i.e. those practising traditional methods (Measures 1A through 4A). From the program point of view, UCN exists among users of traditional methods because the program is geared to supply modern methods of contraception to them.

We discuss below the various measures (2) developed to ascertain the extent of unmet need for contraception.

Measure -1: Gives the proportion of all currently married women under 50 years of age (regardless of their current pregnancy status) who said that they wanted no more children and who were currently not practicing any family planning method.

Measure -1A: Gives the proportion of all currently married women under 50 years of age (regardless of current pregnancy status) who said that they wanted no more children and who were currently using only traditional methods.

Measure -2: Gives the proportion of all currently married, non-pregnant women under 50 years of age who said that they wanted no more children and who were currently not practicing any family planning method.

Measure-2A: Gives the proportion of all currently married women, non-pregnant women under 50 years of age who said that they wanted no more children and who were currently not practicing a modern method of family planning.

Measure-3: Gives the proportion of all currently married, non-pregnant and non-breastfeeding women under 50 years of

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2. The 1985 CPS did not ask any question to ascertain the fecundity status of women. Information on fecundity was obtained from the CPS question relating to the main reasons for non-use. This analysis assumes that the proportion of women fecund in age-group 40-49 years is similar to the proportion fecund in other age groups.
3. The same approach and measures were used by the authors in an earlier paper using the 1983 CPS data. See Khuda and Howlader, 1986a.

age who said that they wanted no more children and who were currently not practicing any family planning method.

Measure-3A: Gives the proportion of all currently married, non-pregnant and non-breastfeeding women under 50 years of age who said that they wanted no more children and were currently not practising a modern method

Measure-4: Gives the proportion of all currently married, non-pregnant, non-breastfeeding and fecund women under the age of 50 years of age who said that they wanted no more children and were currently not using any family planning method.

Measure-4A: Gives the proportion of all currently married non-pregnant, non-breastfeeding fecund women under 50 years of age who said that they wanted no more children and were currently not using a modern method.

2.2 Extent of Unmet Contraceptive Need:

Estimates of UCN, based on the measures discussed in the preceding section, are presented in Table 1. Using the first approach, i.e. women who do not want any more children and are not contracepting, estimate of unmet need ranges from 18.9 percent to 30.2 percent. When users of traditional methods who do not want any more children are included, unmet need ranges from 26.2 percent to 39.9 percent. This approach has the effect of raising the level of unmet need from 5 to 9 percent, depending on the measure used. There is a difference of about 12 percent between the "ceiling" measure and the "floor" measure, i.e. when all currently married women are taken into account the extent of unmet need is about 12 percent higher than when only currently married, non-pregnant, non-breastfeeding and fecund women are considered.

2.3 Differentials in unmet need:

The variables considered have been categorized into four groups; namely, demographic, social, economic, and program. Measure 1 is employed to assess the UCN differentials reported in Table 2. Differentials based on other measures largely conform to the patterns obtained for Measure 1.

2.3.1. Demographic Characteristics

a. Age

UCN rises among older women of reproductive age since the proportion of women not wanting more children

increases with age. A similar relationship was observed from the 1983 CPS data (Khuda and Howlader, 1986a) as well as World Fertility Survey (WFS) data. As can be seen in Table 2, only 15.6 percent of all currently married women aged 20-24 were not using contraception and said they did not want any more children, while among women aged 45-49 this figure was 79.8 percent. However, if one considers the total number of women sampled in these two age groups with UCN, the differentials in UCN by age narrow considerably; namely, 253 women aged 20-24 reported UCN (10.7 percent of all women with UCN), while 409 women aged 45-49 had UCN (17.3 percent of all women with UCN). From this perspective, one may conclude that while UCN is higher among older women, the number of younger women with UCN is not inconsiderable.

b. Number of Living Children

UCN rises with the number of living children, because the proportion of currently married women wanting no more children increases with age and the number of living children. For currently married women with no more than two children, UCN is only 23.0 percent, while at least 49.9 percent of women with five or more children said they do not want any more children and were not using contraception. This finding suggests that there is still considerable scope to increase the use of contraception among older high parity women. However, if the total number of women with UCN by age is considered, one finds that 50.5 percent of women with UCN were concentrated in parities 3-5, which implies that the greatest absolute increase in the use of family planning might occur if services are targeted to these women.

c. Recent Live Birth Status

Recent live birth status is measured by whether a respondent's last birth occurred in the twelve months preceding the survey. UCN is only slightly higher among women whose last birth occurred during the reference period (36.0 percent) than among women whose last birth occurred earlier (33.7 percent). This slight differential could be attributed to the fact that women with a recent live birth might be less inclined to want additional children and use contraception for up to one year post-partum (owing in part to the long durations of breastfeeding and lactational amenorrhea commonly encountered in Bangladesh).

2.3.2. Social Characteristics.

a. Education

UCN is inversely associated with education, and the relationship is consistent for most age groups. UCN for respondents that did not attend school is 33.8 percent, for those attending primary school 24.7 percent, secondary school 16.1 percent, and college/university 8.4 percent. A similar relationship was observed from the 1983 CPS data and studies based upon the WFS data.

This finding is understandable since the proportion of women who desire no more children tends to increase by level of education. In addition, as reported in the 1985 CPS Final Report (Mitra and Associates, 1987) the contraceptive prevalence rate (CPR) increases with higher educational attainment. A more highly educated respondent will tend to have lower family size norms, have greater access to and knowledge of contraceptive services, and therefore be more inclined to use contraception and have lower UCN.

b. Husband's Education

A similar though weaker relationship is observed in the case of husband's education, although there is practically no difference in UCN between those whose husbands did not go to school and those who attended primary school. Better educated men tend to marry women who are also relatively better educated, and hence, there is probably a combined effect of husband's and wife's educational level on contraceptive use and UCN.

c. Place of Residence

UCN is lower among women living in urban areas (21.6 percent) than among women living in rural areas (31.2 percent), and the relationship is consistent for all age groups. A similar relationship was observed from the 1983 CPS data. This pattern may result from the fact that urban women who do not want additional children are likely to have greater access to and knowledge of contraception, which tends to lower UCN in urban relative to rural areas. This differential would likely be more pronounced if the proportion of rural women not desiring additional children was equivalent to levels reported by urban women.

d. Religion

UCN is lower among non-Muslims (23.1 percent) than among Muslims (31.0 percent) for all age groups. A similar relationship was obtained from the 1983 CPS data.

This finding is not totally unexpected in that contraceptive prevalence is higher among non-Muslims than Muslims (Mitra and Associates, 1987), which may indicate that non-Muslims are more inclined to use contraception when no additional children are wanted.

2.3.3. Economic Characteristics

a. Employment Status

UCN is higher among "non-working" women than among "working" women, especially among women aged 30 years and above. There is practically no difference between those receiving cash payment and those not receiving cash payment. A similar relationship was observed using the 1983 CPS data. This finding may partly result from higher contraceptive prevalence among "working" than "non-working" women (Mitra and Associates, 1987), which implies that working women who do not want additional children may more readily use contraception. However, given the relatively small number of women reported as "working", these results must be treated with caution.

b. Landownership

UCN is slightly higher among women belonging to landed households (31.0 percent) than among women belonging to landless households (28.8 percent). This relationship is most pronounced for women aged 30-39. Other age groups report little variation in UCN by landowning status. Data on landholding are available only in a dichotomous form, i.e. whether a respondent belonged to a landless or a landed household. A more meaningful relationship with landholding would probably have emerged if data on the amount of land owned had been collected.

c. Electricity

Women belonging to households with electricity have lower UCN (25.3 percent) than respondents belonging to households without electricity (30.9 percent). This relationship is consistent for all age groups. Similarly, UCN is lower for women residing in areas where there is electricity (28.7 percent) than among respondents residing in areas where there is no electricity (30.9 percent). These relationships strongly suggest that UCN is negatively related to the socio-economic status of households and localities. However it is unclear from these results whether electrification per se, or other criteria such as education, urban/rural status and access to mass media may underlie these differentials.

2.3.4. Program Characteristics

a. Field Work Visit

Women who reported that they had been visited by a fieldworker at least once during the six months preceding the CPS survey data have slightly lower UCN (29.4 percent) than those who had not been visited (31.3 percent). A fieldworker's visit probably has a positive effect on the adoption and continued use of contraception, and thus it is not surprising that UCN is lower among women visited by fieldworkers.

b. Future Intention to Contracept

Those intending to contracept in the future have much lower UCN (29.2 percent) than those not intending to contracept (57.7 percent). The fact that such a large proportion of women with UCN say they do not intend to use contraception in the future suggests that the family planning program needs to better inform these women about the benefits of contraception (especially since they have expressed preferences consistent with fertility limitation) and to ensure that services are readily available.

3. NON-USE OF CONTRACEPTION

3.1. Main reasons for not contracepting:

Those not contracepting at the time of the survey were asked to state the main reason for not using. It is important to stress that some of the respondents may have had more than one reason for not contracepting. In addition, some may not have been able to discern the main reason responsible for non-use. Given these limitations, the main reasons for women not using contraceptives are presented in table 3. Among all currently married non-users (type 1), Table 3 shows that desire for additional children is the single most important reason for non-use. When infecund, breastfeeding and amenorrhic women are excluded (type 2) from the analysis, the desire for additional children gains in relative strength (from 40 to 60 percent). Likewise, husband's objection, religiosity, nonavailability of methods, health reasons and fear of side effects also gain in relative importance.

When analysis is confined to non-users who do not want additional children (types 3 and 4), the data show that

"health reasons" emerge as the most important reason for non-use (no probing was done to identify what these health reasons are), followed by religiosity and husband's objections. Fear of side effects and nonavailability of methods also gain in relative importance. The findings have significant policy implications. The program must improve its IEC activities to overcome much of the socio-cultural resistance to the adoption of family planning as well as remove fear of side effects. The program must also give due consideration to meeting the health concerns of these women. It is likely that among those who reported health reasons, some may have been suffering from actual health related problems prohibiting the use of contraception while others may have perceived potential health hazards in the event of using family planning.

3.2. Differentials in the main reasons for non-use of contraception:

Differentials in the main reasons for not contracepting have been analyzed for all currently married non-users (type 1, table 3) by their selected characteristics. The characteristics have been categorized into four groups, namely, demographic, social, economic, and program. The results are presented in table 4.

3.2.1. Demographic Characteristics

a. Age

The relationship between desire for additional children as a reason for non-use and age of women is in the expected direction; namely, declining with an increase in age (and to a very low level beyond 30 years of age). Infecundability as a reason for non-use increases with age, and is very high among women beyond 40 years of age. The proportion reporting breastfeeding and postpartum amenorrhea rises with an increase in age, and then falls as age advances beyond 35 years since the number of women giving birth declines. There is no clear association with age in relation to the other stated reasons for non-use.

b. Number of Living Children

Desire for additional children is inversely related with the number of living children. The proportion of women not-using owing to a desire for additional children declines substantially beyond two children, and becomes negligible beyond four children (Table 5). Infecundabilty increases with the number of living children. However, it is not clear why husband's objection increases with the number of children,

although it ultimately declines at higher parities. The proportion reporting health reasons is higher among those with a large number of children. Religiosity is more frequently mentioned by women having more children than by those with fewer children. Postpartum amenorrhea rises with the number of children, and then declines beyond six children. Reasons such as fear of side-effects, non-availability of methods, and breastfeeding do not seem to vary substantially with the number of living children, nor do variations demonstrate any clear pattern.

3.2.2. Social Characteristics

a. Education

Contrary to expectations, the desire for additional children is higher among women with education beyond the primary level than among those with lower levels of education. The explanation lies in the fact that most women with schooling beyond the primary level are relatively young, have not yet completed their family size, and hence, have a strong desire for additional children.

Some favourable effects of education are also discernible from the table. Education modernizes attitudes and increases exposure to new ideas and modes of behaviour. This is reflected in the relatively low proportion of women with education beyond the primary level reporting religiosity, fear of side effects and nonavailability of methods as a reason for non-use.

b. Husband's Education

Desire for additional children is slightly lower among women whose husbands had schooling beyond the primary level than among those whose husbands had lower levels of education. However, desire for additional children is most pronounced among women with husbands having college (and above) education. This may have resulted from the late marriage of women who are yet to complete their family size, and therefore, desire additional children.

c. Place of Residence

Desire for additional children is higher among rural than urban women. A similar finding is observed with respect to husband's objection, fear of side effects, religiosity and non-availability of methods. However, the reverse is true with respect to health reasons, infecundability, breastfeeding, and postpartum amenorrhea.

d. Religion

The desire for additional children is higher among non-Muslim than Muslim women. This finding is somewhat curious in that contraceptive use tends to be higher and fertility lower among non-Muslim women (see Mitra and Associates, 1987 and Chapter Two of this report). That Muslim women are traditionally more conservative is reflected in the higher proportions reporting religiosity and husband's objection compared to non-Muslims. Fear of side effects and non-availability of contraceptives are more frequently mentioned by Muslim than non-Muslim women.

3.2.3. Economic Characteristics

a. Employment

Differentials in the main reasons for non-use by employment status are not pronounced. Even if differentials by employment were found significant, the findings should not be given great importance because the number of employed women is very small.

b. Landownership

No marked differentials in the main reason for non-use of family planning by landownership is discernible. This seems to be largely due to the nature of data on landholding, as observed earlier.

c. Electricity

Electricity is likely to have favourable effects on the use of contraceptives via its correlation to education, employment, and socio-economic mobility. Desire for additional children, husband's objection, fear of side effects and religiosity are less frequently mentioned by women belonging to households having electricity than among women belonging to households having no electricity. A similar but less pronounced relationship is observed if electricity in the locality is considered.

3.2.4. Program Characteristics

Fieldworker's Visit

Through regular visits to eligible couples, fieldworkers can motivate women to accept family planning. Desire for additional children is somewhat less frequently mentioned by women who had been visited by fieldworkers than those who had not been visited. The relationship is unclear regarding other reasons for non-use.

3.3. Desire for additional children as the major

A desire for additional children is often given as a reason for non-use among currently married non-users (table 3). However, how important really is this reason for nonuse? We shall examine below women who gave desire for additional children as a reason for non-use with respect to the number and sex composition of their living children. This will help identify target groups for the program.

The number and sex composition of children among parents in a traditional society such as Bangladesh are very important in determining their contraceptive behaviour. In such a context, the value of children, particularly sons, is quite high (Cain, 1977; Khuda, 1977 and 1988), and this often influences the number and sex composition of children a couple will desire.

Table 5 shows the percentage distribution of the number of women who gave desire for additional children as a reason for non-use of family planning by the number and sex composition of their living children.

Among these women, the proportion declines with an increase in the number of children of either sex. Women with no living children account for 36.6 percent of the total number of women not contracepting because they desire additional children. However, women with one living child of either sex account for a relatively low proportion of the total. Women with two living children account for an even lower proportion, and it becomes negligible among women with three or more children. Thus, women with fewer than two living children account for about two-thirds of the total number of women not contracepting because of a desire for additional children.

Although son preference is high among Bangladeshi women, it is perhaps not as high as it is sometimes believed to be. As table 5 shows women with one daughter and those with one son respectively account for 15.2 percent and 13.2 percent of the total number of women not contracepting because of a desire for additional children, indicating that the difference is small. This suggests that although son preference exists among Bangladeshi women, it is perhaps not strong enough to significantly affect reasons for non-use, and thus, fertility.

4. SUMMARY AND CONCLUSIONS

The extent of unmet contraceptive need ranges from 18.9 percent to 30.2 percent for currently married women who are not using any method of contraception, and from 26.2 percent to 39.9 percent for currently married women not using modern methods but currently practicing traditional methods. There are therefore substantial differences between the standard "ceiling" and "floor" measures of UCN in Bangladesh. However, even if the program is able to meet the "floor" measures of UCN in the future, contraceptive prevalence will record quite a sharp increase. Of the different variables considered in the differential analysis of UCN, six factors appear to be important. These are: (1) future intention to contracept, (2) education, (3) electricity, (4) place of residence, (5) parity and (6) religion.

Desire for additional children is the most important reason for nonuse of contraception among all currently married non-users. However, of those desiring additional children about two-thirds are those with fewer than two living children, suggesting that the remaining one third are the priority target group for the program. Moreover, when the main reasons for non-use are examined for currently married non-users who do not desire additional children, issues such as health reasons, religiosity, husband's objection, fear of side effects, and non-availability of methods gain in importance.

The overall findings of the paper indicate that although "substantial" unmet need exists in the country, several factors may inhibit many of the non-users from practicing contraception in the future. Should the program strive to meet UCN in the future, supply mechanisms will have to be improved and strengthened to overcome many of the barriers to the adoption of family planning. Special mention may be made of the following: improving the frequency and quality of fieldworker visit, strengthening the supervisory system, and developing innovative IEC messages to overcome sociocultural barriers. The program must also give due consideration to counselling, quality level clinical services and follow-up to deal with the fear of, and actual, side effects and other perceived health related barriers. However, the measures suggested above can raise CPR upto a certain desired level, and any increase beyond that level requires an improvement in the socio-economic conditions of the population.

Table 1

Measures of Unmet Contraceptive Need in Bangladesh, 1985 (Percents)

MEASURES	EXTENT OF UNMET NEED
Measure 1	30.2
Measure 1A	39.9
Measure 2	29.5
Measure 2A	34.6
Measure 3	27.9
Measure 3A	33.0
Measure 4	18.9
Measure 4A	26.2

Table 2

Unmet Need by Characteristics of Respondents
In Bangladesh, 1985 (Measure 1)

Demographic Characteristics

Age

Age Group	N	% UCN	Total Women With UCN
< 15	118	0.3	0
15-19	1282	5.5	71
20-24	1619	15.6	253
25-29	1577	24.8	391
30-34	1200	35.0	420
35-39	897	46.6	418
40-44	617	65.2	402
45-49	512	79.8	409
All	7822	30.2	2364

Number of Living Children

Total number of living children	Age (20	20-29	30-39	40-49	All	Women With UCN
0	0.6 (739)	0.7 (275)	(47)	18.0 (17)	0.3 (1077)	10
1	5.5 (511)	5.1 (601)	26.2 (70)	79.4 (24)	8.0 (1207)	97
2	23.4 (139)	17.9 (929)	28.2 (180)	85.0 (60)	23.0 (1308)	301
3	34.7 (9)	27.6 (769)	33.5 (301)	76.6 (99)	33.2 (1178)	391
4	- (0)	33.2 (388)	38.6 (464)	69.0 (130)	40.5 (982)	398
5	- (0)	42.7 (163)	41.1 (442)	76.2 (192)	49.9 (797)	398
6	- (0)	47.8 (54)	52.0 (315)	66.9 (203)	56.9 (571)	325
7	- (0)	28.9 (10)	52.5 (174)	70.3 (169)	60.4 (353)	213
8	- (0)	100.0 (3)	48.4 (71)	68.4 (116)	61.4 (190)	117
9+	- (0)	50.0 (4)	54.4 (34)	77.3 (119)	71.6 (157)	112
N	5.0 (1400)	20.1 (3196)	40.0 (2097)	71.8 (1129)	30.2 (7822)	2362

Recent Live Birth Status

Last birth status	Age (20	20-29	30-39	40-49	All	Women With UCN
Yes	12.2 (336)	35.5 (791)	57.5 (323)	66.5 (51)	36.0 (1501)	540
No	6.4 (391)	16.5 (2185)	37.4 (1738)	72.6 (1067)	33.7 (5381)	1814
N	9.1 (727)	21.5 (2977)	40.6 (2061)	72.3 (1117)	34.2 (6882)	2354

Social Characteristics

Education of Respondent

Education of Respondent	Age <20	20-29	30-39	40-49	All	Women With UCN
Did not attend school	5.0 (865)	21.3 (2072)	42.7 (1503)	74.2 (926)	33.8 (5366)	1814
Primary school	4.7 (379)	19.9 (750)	35.3 (442)	63.0 (167)	24.7 (1738)	429
High school	5.8 (143)	14.4 (307)	25.9 (114)	52.0 (25)	16.1 (589)	95
College/University	- (6)	6.5 (46)	10.4 (25)	26.7 (5)	8.4 (82)	7
N	5.0 (1393)	20.1 (3176)	39.8 (2084)	71.8 (1123)	30.1 (7776)	2345

Husband's Education

Husbands' Education	Age <20	20-29	30-39	40-49	All	Women With UCN
Did not attend school	5.0 (718)	19.7 (1511)	42.5 (1037)	74.3 (592)	31.5 (3857)	1215
Primary school	6.7 (312)	22.5 (697)	40.3 (498)	71.5 (276)	32.3 (1783)	576
High school	3.7 (254)	21.4 (660)	37.9 (394)	67.0 (198)	28.7 (1506)	432
College/University	4.3 (78)	14.3 (272)	19.7 (124)	49.4 (28)	16.0 (502)	60
N	5.1 (1362)	20.2 (3140)	39.7 (2053)	71.6 (1094)	30.1 (7649)	2303

Place of Residence

Type of residence	Age (20	20-29	30-39	40-49	All	Women With UCW
Rural	5.2 (1276)	20.9 (2844)	41.3 (1872)	72.5 (1045)	31.2 (7037)	2196
Urban	3.7 (379)	13.8 (1076)	28.4 (687)	62.7 (255)	21.6 (2397)	518
Total	4.8 (1655)	19.0 (3920)	37.9 (2559)	70.6 (1300)	28.7 (9434)	2714

Religion

Religion	Age (20	20-29	30-39	40-49	All	Women With UCW
Muslim	5.5 (1258)	20.8 (2863)	41.3 (1859)	72.9 (1014)	31.0 (6994)	2168
Non Muslim	0.9 (142)	14.7 (334)	29.7 (238)	61.8 (114)	23.1 (828)	191
N	5.0 (1400)	20.1 (3196)	40.0 (2097)	71.8 (1129)	30.2 (7822)	2359

Economic Characteristics

Employment Status

Emp. status of Respondent	Age <20	20-29	30-39	40-49	All	Women With UCN
Employment with cash	6.7 (30)	16.6 (168)	26.1 (136)	58.0 (44)	24.0 (378)	91
Employment without cash	- (11)	23.2 (27)	25.8 (22)	55.6 (9)	24.5 (69)	17
No employment	5.0 (1360)	20.3 (3001)	41.1 (1939)	72.5 (1076)	30.6 (7375)	2257
N	5.0 (1400)	20.1 (3196)	40.0 (2097)	71.8 (1129)	30.2 (7822)	2365

Landownership

Landownership of family	Age <20	20-29	30-39	40-49	All	Women With UCN
Own land	4.6 (935)	20.1 (2071)	41.4 (1332)	72.1 (794)	31.0 (5078)	1574
Does not ownland	5.9 (465)	20.2 (1180)	37.4 (765)	71.1 (334)	28.8 (2744)	790
N	5.0 (1400)	20.1 (3196)	40.0 (2097)	71.8 (1128)	30.2 (7822)	2364

Electricity in Household

Electricity in own house	Age <20	20-29	30-39	40-49	All	Women With UCN
Yes	3.7 (150)	14.3 (434)	33.5 (269)	66.1 (141)	25.3 (994)	251
No	5.2 (1250)	21.1 (2762)	40.9 (1828)	72.0 (988)	30.9 (6828)	2110
N	5.0 (1400)	20.1 (3196)	40.0 (2097)	71.8 (1129)	30.2 (7822)	2361

Electricity in Locality

Electricity in Locality	Age <20	20-29	30-39	40-49	All	Women With UCN
Yes	5.7 (386)	19.2 (984)	36.6 (681)	66.8 (340)	28.7 (2391)	686
No	4.8 (1014)	20.6 (2213)	41.6 (1416)	74.0 (788)	30.9 (5431)	1678
N	5.0 (1400)	20.1 (3196)	40.0 (2097)	71.8 (1129)	30.2 (7822)	2364

Program Characteristics

Fieldworker Visit

Field Worker Visit	Age <20	20-29	30-39	40-49	All	Women With UCN
Yes	6.4 (298)	19.6 (873)	39.2 (541)	67.7 (265)	29.4 (1977)	581
No	4.7 (1093)	21.1 (2239)	41.9 (1493)	73.7 (856)	31.3 (5681)	1778
N	5.1 (1391)	20.7 (3112)	41.1 (2034)	72.3 (1121)	30.8 (7658)	4723

Future Intention to Contracept

Intention to use method in future	Age <20	20-29	30-39	40-49	All	Women With UCN
Yes	6.0 (788)	29.5 (1403)	55.8 (567)	73.9 (80)	29.2 (2839)	829
No	6.1 (261)	23.8 (617)	68.5 (658)	93.0 (772)	57.7 (2308)	1332
N	5.3 (1049)	27.8 (2020)	62.6 (1225)	91.2 (852)	42.0 (5147)	2161

Table-3

REASONS FOR NON-USE OF FAMILY PLANNING AMONG NON-USERS BY TPES IN BANGLADESH-1985

Reasons	Percentage distributions of non-users by types			
	a 1	b 2	c 3	d 4
Desire for additional children	40.2	60.1	NA	NA
Husbands objection	5.0	7.5	6.7	16.5
Religiosity	7.2	10.8	8.2	20.1
Infecundity	16.3	NA	37.8	NA
Breastfeeding and amenorrhea	16.9	NA	21.5	NA
Non-availability of methods	2.3	3.4	4.4	10.8
Health reasons	5.1	7.7	10.2	25.0
Fear of side effects	2.7	4.0	4.7	11.6
Don't know/No response	4.3	6.5	6.5	16.0
N	5018	3352	2083	848

(a) All currently married non-users.

(b) All currently married non-users, excluding infecund breastfeeding and amenorrhic women.

(c) All currently married non-users, who do not want additional children measure 1

(d) All currently married non-users, who do not want additional children (Measure 1), excluding infecund, breastfeeding and amenorrhic women.

Table 4

Main Reasons For Non Use of Contraception By Characteristics of Respondents in Bangladesh-1985

Characteristics	Want additional children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Post amenorrhea	Others	Don't know not reasons	Total
Age												
15	88.0	3.9	-	-	-	-	1.9	1.0	1.0	2.3	1.9	100.0
	(91)	(4)					(2)	(1)	(1)	(2)	(2)	(103)
15-19	74.4	2.7	1.0	0.6	2.7	0.2	1.3	2.5	11.5	1.6	1.4	99.9
	(714)	(26)	(10)	(6)	(26)	(2)	(13)	(24)	(110)	(15)	(14)	(960)
20-24	56.2	4.2	3.3	2.3	4.0	0.5	2.2	5.1	17.9	2.0	2.1	99.8
	(593)	(44)	(35)	(24)	(43)	(5)	(24)	(54)	(189)	(22)	(22)	(1054)
25-29	40.8	8.3	6.4	3.9	7.8	1.6	2.7	6.0	18.7	2.4	1.5	100.1
	(354)	(72)	(56)	(34)	(68)	(14)	(23)	(52)	(162)	(21)	(13)	(867)
30-34	24.7	8.3	8.9	4.5	13.7	8.3	4.3	5.9	14.9	3.7	2.7	99.9
	(163)	(55)	(59)	(30)	(91)	(55)	(28)	(39)	(99)	(25)	(18)	(663)
35-39	13.6	6.0	13.1	4.5	10.9	26.7	2.5	3.0	13.5	2.4	3.7	99.9
	(70)	(31)	(67)	(23)	(56)	(137)	(13)	(15)	(70)	(12)	(19)	(514)
40-44	4.9	3.5	4.9	3.0	11.3	60.4	2.2	2.4	2.7	3.2	1.4	99.9
	(21)	(15)	(21)	(13)	(49)	(261)	(10)	(10)	(12)	(14)	(6)	(432)
45-49	2.1	1.0	2.3	0.5	7.4	80.2	0.7	0.2	2.2	1.4	2.0	100.0
	(9)	(4)	(10)	(2)	(31)	(342)	(3)	(1)	(9)	(6)	(8)	(426)
N	40.1	5.0	5.1	2.6	7.2	16.3	2.3	3.9	13.0	2.3	2.0	99.8
	(2015)	(252)	(258)	(133)	(363)	(816	(115)	(197)	(651)	(117)	(102)	(5018)

Number of Living Children

Total number of living children	Want additional children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Postamenorrhea	Others	Don't know not reasons	Total
0	90.9	1.3	0.5	0.2	0.8	2.4	0.6	-	0.3	1.5	1.7	100.2
	(726)	10)	(4)	(1)	(6)	(19)	(5)		(2)	(12)	(14)	(799)
1	66.4	1.8	2.2	1.1	2.6	3.3	0.8	3.8	14.4	2.3	1.3	100.0
	(563)	(15)	(19)	(9)	(22)	(28)	(7)	(32)	(122)	(20)	(11)	(848)
2	45.5	5.8	3.9	1.5	5.2	8.7	2.5	5.3	17.1	2.3	2.3	100.1
	(375)	(48)	(32)	(12)	(43)	(72)	(21)	(44)	(140)	(19)	(19)	(823)
3	27.4	7.1	7.1	3.9	7.3	14.3	2.6	6.0	18.4	3.2	2.8	100.1
	(186)	(49)	(48)	(26)	(50)	(98)	(18)	(41)	(125)	(22)	(19)	(681)
4	16.0	8.3	9.8	4.4	11.2	20.1	3.6	5.4	15.8	2.8	2.6	100.0
	(87)	(45)	(53)	(24)	(61)	(109)	(20)	(29)	(86)	(15)	(14)	(543)
5	9.9	7.5	7.8	5.0	13.0	27.9	3.8	3.4	16.1	2.6	3.0	100.0
	(49)	(37)	(39)	(25)	(64)	(138)	(19)	(17)	(79)	(13)	(15)	(493)
6	4.1	7.2	9.0	5.3	11.8	36.9	2.8	5.5	14.1	1.9	1.4	100.0
	(15)	(26)	(33)	(19)	(43)	(134)	(10)	(20)	(51)	(7)	(5)	(363)
7	4.4	5.5	7.2	3.0	18.6	40.7	4.8	2.8	10.3	2.2	0.6	100.1
	(10)	(13)	(17)	(7)	(43)	(94)	(11)	(6)	(24)	(5)	(1)	(230)
8	1.6	4.6	5.7	2.4	16.9	47.3	3.3	4.1	10.1	1.1	3.0	100.1
	(2)	(6)	(7)	(3)	(21)	(58)	(4)	(5)	(12)	(1)	(4)	(123)
9+	1.8	2.6	6.7	5.3	10.3	59.2	0.9	2.6	7.0	2.6	0.9	99.9
	(2)	(3)	(8)	(6)	(12)	(67)	(1)	(3)	(8)	(3)	(1)	(113)
N	40.2	5.0	5.1	2.6	7.2	16.3	2.3	3.9	13.0	2.3	2.0	99.9
	(2015)	(251)	(258)	(133)	(363)	(816)	(115)	(197)	(650)	(117)	(102)	(5016)

Characteristics	Want addition children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Post amenorrhea	Others	Don't know not reasons	Total
Education of Respondents												
Never attend school	38.0 (1384)	5.1 (184)	5.0 (182)	2.8 (102)	7.3 (264)	18.8 (685)	2.6 (96)	4.0 (144)	12.4 (451)	2.0 (74)	2.0 (73)	100 0 (3639)
Primary school	43.6 (456)	5.0 (52)	5.3 (55)	2.7 (29)	7.8 (82)	10.8 (113)	1.5 (16)	3.8 (40)	14.7 (154)	2.8 (30)	1.9 (20)	99.9 (1046)
High school	54.0 (150)	5.0 (14)	7.2 (20)	0.5 (1)	4.7 (13)	4.4 (12)	1.2 (3)	4.2 (12)	12.3 (34)	4.1 (11)	2.4 (7)	100.0 (277)
College/University	37.0 (8)	-	1.6	-	1.6	12.9 (3)	1.6	6.4 (1)	30.8 (6)	4.9 (1)	3.2 (1)	100.0 (20)
Madrasha	57.2 (11)	5.4 (1)	1.8	5.4 (1)	5.4 (1)	5.4 (1)	-	-	7.1 (1)	7.1 (1)	5.4 (1)	100.2 (19)
Others	37.3 (6)	-	-	-	17.7 (3)	13.7 (2)	-	-	25.5 (4)	-	5.9 (1)	100.1 (17)
N	40.1 (2015)	5.0 (252)	5.1 (258)	2.6 (133)	7.2 (363)	16.3 (816)	2.3 (115)	3.9 (197)	13.0 (651)	2.3 (117)	2.0 (102)	99.8 (5018)

Characteristics	Want additional children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Post amenorrhea	Others	Don't know not reasons	Total
Husband's Education												
Did not attend school	40.8 (1068)	5.0 (130)	4.4 (116)	2.6 (69)	7.2 (189)	17.0 (446)	2.8 (72)	4.0 (105)	12.2 (319)	1.7 (45)	2.2 (57)	99.9 (2614)
Primary school	39.2 (464)	5.1 (60)	5.1 (61)	3.0 (35)	6.9 (82)	16.2 (192)	1.9 (22)	4.3 (51)	13.4 (159)	2.9 (35)	1.9 (23)	99.9 (1185)
High school	38.8 (342)	4.8 (42)	7.4 (65)	2.5 (22)	7.6 (67)	15.7 (138)	1.9 (17)	3.2 (28)	13.3 (117)	3.1 (27)	1.8 (16)	100.1 (881)
College/ University	45.3 (96)	3.8 (8)	5.3 (11)	1.6 (3)	5.5 (12)	6.2 (13)	0.3 (1)	5.2 (11)	19.7 (42)	4.4 (9)	2.8 (6)	100.1 (212)
Madrasha	39.2 (16)	19.2 (8)	7.2 (3)	-	16.8 (7)	9.6 (4)	-	2.4 (1)	5.6 (2)	-	-	100.0 (42)
Don't	34.2 (27)	3.8 (3)	2.9 (2)	3.3 (3)	8.3 (7)	25.8 (21)	3.8 (3)	1.3 (1)	15.0 (12)	1.3 (1)	0.4	100.1 (80)
Others	25.0 (1)	25.0 (1)	-	-	-	50.0 (2)	-	-	-	-	-	100.0 (4)
N	40.2 (2015)	5.0 (252)	5.1 (258)	2.6 (133)	7.2 (363)	16.3 (816)	2.3 (115)	3.9 (197)	13.0 (651)	2.3 (117)	2.0 (102)	99.9 (5018)

Characteristics	Want additional children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Post menopausal	Others	Don't know not reasons	Total
Place of Residence												
Rural	40.3	5.1	5.0	2.7	7.5	16.1	2.4	3.9	12.8	2.2	1.9	99.9
	(1880)	(238)	(233)	(126)	(351)	(751)	(111)	(182)	(597)	(103)	(89)	(4661)
Urban	37.7	3.9	7.0	1.8	3.5	18.1	1.2	4.1	15.2	3.9	1.9	100.1
	(411)	(42)	(76)	(20)	(38)	(197)	(13)	(45)	(166)	(42)	(20)	(1090)
N	39.8	4.9	5.4	2.5	6.8	16.5	2.2	3.9	13.3	2.5	2.2	100.0
	(2291)	(280)	(309)	(146)	(389)	(948)	(124)	(227)	(763)	(145)	(129)	(5751)
Religion												
Muslim	39.1	5.1	5.0	2.7	7.6	16.1	2.4	4.0	13.3	2.5	2.1	99.9
	(1778)	(234)	(229)	(123)	(348)	(734)	(109)	(182)	(607)	(113)	(95)	(4553)
Non-Muslim	50.8	3.9	6.2	2.0	3.3	17.5	1.4	3.1	9.6	0.8	1.5	100.1
	(236)	(18)	(29)	(9)	(15)	(82)	(6)	(15)	(45)	(4)	(7)	(465)
N	40.1	5.0	5.1	2.6	7.2	16.3	2.3	3.9	13.0	2.3	2.0	99.8
	(2015)	(252)	(258)	(133)	(363)	(816)	(115)	(197)	(651)	(117)	(102)	(5018)
Employment												
Employed with cash	40.8	5.1	4.5	3.0	5.2	17.2	3.2	4.0	10.8	4.5	1.7	100.0
	(81)	(10)	(9)	(6)	(10)	(34)	(6)	(8)	(21)	(9)	(3)	(198)
Employed without cash	45.3	5.1	7.7	-	7.7	14.5	8.5	2.6	5.1	2.6	0.8	99.9
	(18)	(2)	(3)		(3)	(6)	(3)	(1)	(2)	(1)	(-)	(39)
Not	40.1	5.0	5.1	2.6	7.3	16.2	2.2	3.9	13.1	2.2	2.1	99.8
	(1916)	(240)	(246)	(127)	(350)	(776)	(106)	(188)	(628)	(107)	(98)	(4781)
N	40.1	5.0	5.1	2.6	7.2	16.3	2.3	3.9	13.0	2.3	2.0	99.8
	(2015)	(252)	(258)	(133)	(363)	(816)	(115)	(197)	(651)	(117)	(102)	(5018)

Characteristics	Want additional children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Post menopausal	Others	Don't know not reasons	Total
Land Ownership Status												
Owns land	39.9 (1303)	5.0 (164)	5.0 (162)	2.8 (91)	7.6 (249)	16.9 (552)	2.2 (73)	3.7 (120)	12.4 (406)	2.4 (77)	2.0 (67)	99.9 (3264)
Does not owniand	40.6 (711)	5.0 (88)	5.6 (96)	2.4 (42)	6.5 (114)	15.0 (263)	2.4 (42)	4.4 (77)	14.0 (245)	2.3 (40)	2.0 (35)	100.1 (1753)
N	40.2 (2015)	5.0 (252)	5.1 (258)	2.6 (133)	7.2 (363)	16.2 (815)	2.3 (115)	3.9 (197)	13.0 (651)	2.3 (117)	2.0 (102)	99.8 (5018)
Electricity in Household												
Yes	36.6 (179)	3.7 (18)	6.4 (31)	1.9 (9)	3.1 (15)	21.3 (104)	1.3 (6)	4.7 (23)	14.2 (69)	3.2 (16)	3.5 (17)	99.9 (489)
No	40.5 (1836)	5.2 (234)	5.0 (226)	2.7 (123)	7.7 (349)	15.7 (712)	2.4 (109)	3.8 (174)	12.9 (582)	2.2 (101)	1.9 (85)	100.0 (4529)
N	40.1 (2015)	5.0 (252)	5.1 (258)	2.6 (133)	7.2 (363)	16.3 (816)	2.3 (115)	3.9 (197)	13.0 (651)	2.3 (117)	2.0 (102)	99.8 (5018)
Electricity in Locality												
Yes	37.2 (503)	5.5 (74)	5.7 (78)	2.2 (30)	6.1 (83)	18.1 (245)	1.6 (22)	3.5 (47)	14.0 (189)	3.2 43)	2.8 (37)	99.9 (1352)
No	41.2 (1511)	4.8 (177)	4.9 (180)	2.8 (103)	7.7 (281)	15.6 (570)	2.5 93)	4.1 (150)	12.6 (462)	2.0 (74)	1.8 65)	100.0 (3666)
N	40.1 (2015)	5.0 (252)	5.1 (258)	2.6 (133)	7.2 (363)	16.3 (816)	2.3 (115)	3.9 (197)	13.0 (651)	2.3 (117)	2.0 (102)	99.8 (5018)

Characteristics	Want additional children	Husband objects	Health reasons	Fear of side effects	Religious reasons	Wife believes she is unable to have children	Methods not available	Breast feeding	Post amenorrhea	Others	Don't know not reasons	Total
Fieldworker Visit												
Yes	38.9	5.3	6.4	3.7	6.7	15.3	1.0	5.4	14.5	1.8	1.0	100.0
	(463)	(63)	(77)	(45)	(80)	(182)	(11)	(65)	(172)	(22)	(12)	(1191)
No	40.6	4.9	4.7	2.3	7.4	16.5	2.7	3.5	12.5	2.5	2.4	100.0
	(1552)	(188)	(181)	(88)	(284)	(633)	(104)	(132)	(478)	(95)	(90)	(3826)
N	40.2	5.0	5.1	2.6	7.2	16.3	2.3	3.9	13.0	2.3	2.0	99.9
	(2015)	(252)	(258)	(133)	(363)	(816)	(115)	(197)	(650)	(117)	(102)	(5017)

Table-5

PERCENTAGE DISTRIBUTION OF WOMEN NOT CONTRACEPTING BECAUSE THEY DESIRE ADDITIONAL CHILDREN BY THE NUMBER AND SEX COMPOSITION OF THIER LIVING CHILDREN IN BANGLADESH 1985.

Child group	Number of children by sex composition.	Percentage of Total N =
0- Child group	0 child	36.6
1- Child group	1 son	15.2
2- Child group	2 daughters	13.2
	1 daughter and 1 son	7.5
	2 sons	4.4
3- Child group	3 daughters	2.3
	2 daughters and 1 son	3.3
	1 daughter and 2 sons	2.2
	3 sons	1.5
4- Child group	4 daughters	1.2
	3 daughters and 1 son	1.1
	2 daughters and 2 sons	1.0
	1 daughter and 3 sons	0.7
	4 sons	0.4
5- Child group	5 daughters	0.3
	4 daughters and 1 son	0.7
	3 daughters and 2 sons	0.5
	2 daughters and 3 sons	0.6
	1 daughter and 4 sons	0.2
	5 sons	0.2

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Chapter Five

DURATION OF CONTRACEPTIVE USE IN BANGLADESH

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INTRODUCTION

The International Conference on Population, held in Mexico City in August, 1984, generated a variety of recommendations on world population problems. In regard to reproduction and the family, governments were urged to make information, education, and access to the means to achieve desired family size universally available (Brown, 1984).

In Bangladesh, as in many countries, the goals of the family planning program are two-tiered. By making information, education, and access to family planning services universally available, the program hopes to create an environment requires that two conditions prevail within society:

i) availability of a wide range of effective contraceptives from which couples may choose the most appropriate method;

ii) a desire among couples to choose an appropriate method and use it to space births or limit family size.

If these conditions exist, the possibility for fertility decline also exists.

To measure the success of family planning programs, government planners frequently use contraceptive prevalence as an indicator. This measure may indicate availability of family planning, but taken alone it provides little information on underlying strengths and weaknesses of a program. The prevalence rate at a particular instant gives no indication of method mix, effectiveness of methods within the society, or average age/parity at acceptance, all of which have major implications for fertility decline.

Evaluation and improvement of a program's effectiveness requires measurement of duration of use by method and by socio-economic and demographic characteristics of users. Program managers may use this data, which reflects use-effectiveness of different methods in reality to rank methods by their observed "field" effectiveness and their acceptability to various subgroups of the population. Clinic

staff and field workers may then be trained to encourage new acceptors to choose the most effective method that is also appropriate on the grounds of parity, religion, and other individual characteristics. If couples choose methods well-suited to their current needs for family planning, the likelihood of effective and prolonged use is increased.

The above discussion is particularly relevant to Bangladesh, which is passing through a crucial transition in its efforts to slow the pace of population growth. Evidence indicates fertility has declined somewhat since the mid seventies (Islam, 1988). The reduction in CBR from about 50 to about 40 over this period results primarily from rising contraceptive prevalence. If this decline is to continue, however, information on continuation rates by method and by socio-economic and demographic characteristics must be incorporated into program planning.

Currently, sterilization acceptors account for a large portion of contraceptive prevalence in Bangladesh (about 37 percent of the overall method mix). Though these permanent methods are obviously highly effective, they are only attractive to couples who have already achieved their desired family size. The non-reversibility of these methods may make them inappropriate to young, low parity couples who wish to use family planning to space births; consequently, the proportion of sterilization acceptors among couples eligible for family planning may not be increased beyond some maximum level. Furthermore, the irreversibility of the method implies a long and exhaustive process of motivation. If the government establishes a family planning program with balanced targets for permanent and temporary methods, the program can make required headway for rapid decline in the level of fertility.

Before effective birth spacing programs can be implemented, however, background information about method effectiveness in the specific cultural context in question is necessary. Planners should incorporate information about availability of different methods, socio-economic and demographic characteristics of couples considering acceptance of these methods, method-specific durations of use, and reasons for discontinuation. A program based on this analysis will be cost effective as well because workers will minimize time spent trying to motivate couples to accept inappropriate methods.

Several technical measures of use effectiveness exist for comparing different methods. These measures differ in the manner in which they treat the period of nonuse that is followed by complete termination of that method. Demographic

effectiveness, first introduced by Tietze in 1959, includes both periods of intermittent used and periods of non-use that end in termination of a method. Use-effectiveness now refers to effectiveness which covers all periods of use, but excludes periods of nonuse that terminate in discontinuation (Tietze and Lewit, 1968). Extended use-effectiveness, in which periods of use and nonuse are measured separately, is most relevant to modern methods.

Regardless of which measurement is chosen to represent use-effectiveness of different methods, comparison of methods in a effort to rank them by appropriateness and efficacy in the particular setting in which they are to be used is not complete without comparing durations of use by method. Time and energy spent recruiting a couple to accept a nonpermanent method is not well utilized if that couple contracepts for only a few months. The likelihood of this situation arising declines if clinicians and fieldworkers use information on duration of use by method for various socio-economic and demographic characteristics in recommending methods to potential acceptors.

Two sources of data are available for calculation of method-specific duration of use. The first of these sources is the Management Information System Unit of the Family Planning Directorate of Bangladesh (Choudhuri et al., 1986), which collects information from 11,604 households in 12 wards. Though informative, these data do not provide national level estimates of duration of use.

The 1985 CPS also contains information from which duration of use and continuation rates may be calculated. This study calculates duration of first-segment use of contraception during 1983-85 (from the 1985 CPS). The study also estimates 12 month continuation rates for various methods by selected socio-economic and demographic characteristics.

DATA

The 1985 CPS data come from 10,305 ever-married women under 50 years of age. The rural and urban strata constituted 7682 and 2623 ever-married women respectively. The weight for the rural individual sample was unity. The weight for the urban individual sample was .32753 (Mitra, 1987). The total number of ever-married women for the weighted national sample was 8541. The data analyzed in this paper are from the weighted ever-married sample. Interviews of respondents took place over a period from December, 1985 to July, 1986. Respondents reported month-by-month use or non-use of contraception for the three year period from

January, 1983 to December 1985 (termed the reference period).

QUALITY OF DATA

Data limitations posed some serious problems for the analysis. First, respondents appear to have overreported past use of contraception relative to current use (see Table 9.1, p. 230, Mitra, 1987). Average monthly rates for periods further back in time should be lower, given memory lapse, than rates for recent periods. Second, because the data are retrospective it does not include any information on users who died during the reference period. Third, interviewers did not cross check stated use and non-use of family planning methods. This problem is particularly relevant to traditional methods of withdrawal and safe period and to modern methods of oral pill and condom that require constant vigilance on the part of the user. While reliability at the individual level is not high, aggregate estimates may be more reliable (Laing, 1985). However, overstatement of use probably renders estimates higher than their true values.

From an understanding of how the data were collected it becomes clear that respondents may have substantially overreported durations of use. Interviewers asked respondents "In what month and year did you begin using (method), after which you have been continuously using it until now or before you stopped using it in (month)?". On the questionnaire one cell referred to each month in the reference period and was kept blank if respondents had not used any method in that month. If respondents began using contraception before January, 1983 they were coded as beginning in January, 1983. Certainly this procedure resulted in overreporting for this month. From Table 8 it is apparent that a general bias toward reporting longer durations of use occurred as well. Excluding sterilization, from one-third to one-half of continuing users at the cutoff point reported to have been using contraception for durations of 31 months. It is highly unlikely that women really practiced methods such as safe period and withdrawal continuously for three years.

The accumulated evidence of overreporting as well as the other data limitations discussed above warn against too literal an interpretation of the specific numbers reported in the tables. Analysis of the general patterns in the tables, however, provides an idea of differential use of contraception by method and characteristics of users in Bangladesh.

CONTINUATION RATE

Several measures of continuation rates exist. i.e. first-segment continuation rate. first-use continuation rate, and all-method continuation rate. The first-segment continuation rate is the probability that an acceptor of a particular method will continue to use that method uninterruptedly for a specified period. The probability multiplied by 100 gives percentage of users expected to use a method uninterruptedly for a specific period of time (Balakrishnan, Kantner, and Allingham, 1975; Laing, 1982). First-segment rates provide only a snapshot of an acceptor's use of one method during one period of time. In this paper, first-segment rates imply nothing about the user's past history of use of other methods, nor do they imply that the user has never before used the method in question.

This paper does not use the cross-sectional approach developed by Laing (1985) because of certain demerits of the method, particularly when applied to the set of data under consideration. The cross-sectional approach first obtains monthly continuation rates (MCR's), then converts these to annual continuation rates (ACR's) by the following formula:

$$ACR=100(MCR)^{12}.$$

These rates can lead to distorted estimates if monthly continuation rates vary with duration of use. It is very likely, as is evident from subsequent discussions, that such variations occur. Continuation rates vary over duration to a large extent even within twelve months. Variations in monthly continuation rates among different methods of contraception will further affect these estimates. The errors associated with the conversion of monthly continuation rates to annual continuation rates by the cross-sectional approach may confound the differential analysis as well.

This study uses the life table approach to:

a) estimate duration of use following acceptance of a method during the reference period;

b) analyze the continuation differentials for selected demographic and socio-economic characteristics.

For the first objective, this paper presents first-segment continuation rates by method within the reference period for selected demographic and socio-economic characteristics of users. For the second objective, the paper presents twelve-month continuation rates for selected demographic and socio-economic characteristics. A brief

overview of the methods estimation for continuation rates follows (see Balaikrishnan, Kantner, and Allingham (1975) and Laing (1982) for details).

First-segment methods of contraception were regrouped to obtain reasonable cell frequencies for the analysis. New categories are oral pill, condom, sterilization (male and female), IUD, safe period, and "others." The "others" category includes vaginal methods, injection, menstrual regulation (MR), withdrawal, abstinence, etc. For obvious reasons continuation rates for sterilization are not shown.

Single-Decrement Life Table Approach

The data inputs required for obtaining monthly continuation rates (MCR) are:

(1) number of months from January, 1983 until the month of termination or cut-off point, December, 1985, for respondent;

(2) information regarding terminal status (TS) at cut-point, i.e. if termination occurred before cut-off point then TS=T. Then Cx+ Tx denotes the total number of users continuing or terminated during the month x.

Now let us observe the following notations:

x = the duration of use of a method of contraception;

Nx = the number of users observed at duration x;

N_x^* = the number of observed user months of exposure to the risk of termination.

Then the monthly termination rates (MTR) for the month x is obtained by the following formula:

$$MTR = (Tx/N_x^*)$$

where $N_x^* = Nx - Cx/2$ The monthly continuation rate for the month x is:

$$MCRx = 1 - MTRx.$$

Multiple Decrement Life Table Approach

The sample size imposes a serious limitation on the data for using the multiple-decrement life table. Even after grouping the data in three month intervals, numbers of observations by reasons of not currently using contraception were too small for analysis.

A further problem is lack of data on reason for termination of first-segment use of a method. When questioning respondents on their history of contraceptive use, interviewers did not ask reasons for termination of first-segment use. However, interviewers did obtain reasons for not using family planning methods from respondents who were not current users of any method at the time of interview. In the absence of more direct data we may use this data to obtain a general idea about the reasons for terminating use of a method. Thus, in this paper, reasons for non-use are interpreted broadly as reasons for termination. Four broad categories comprise reasons for non-use:

(a) Category 1 (P) is related to additional children. It consists of desire for additional children, currently breastfeeding, or post-partum amenorrhea;

(b) Category 2 (M) represents medical reasons, including health reasons and fear of side effects;

(c) Category 3 (R) consists of various types of constraints imposed on a user, such as religion, objections of her husband, or non-availability of a method, etc.;

(d) Category 4 (O) represents all other reasons.

Another category (S) refers to those women who terminated use of one method in order to switch to another method.

As mentioned above, data problems limit use of the multiple decrement table. The table may be used to identify a general pattern of reasons for termination. A much larger sample would be needed before the actual decrement rates could be accepted as accurate. The paper presents a multiple-decrement table only for oral pill, a method for which numbers of observations were relatively large.

Let us observe the following notations:

x = duration in three month intervals;

$N_x^{(T)}$ = the number of women using oral pill at the beginning of the quarter;

Px = number of women terminating use of oral pill for reasons mentioned in category 1 during quarter x;

Mx = number of women terminating use of oral pill for reasons mentioned in category 2 during quarter x;

Rx = number of women terminating use of oral pill for reasons mentioned in category 3 during quarter x;

Ox = number of women terminating use of oral pill for reasons mentioned in category 4 during quarter x;

Sx = number of women switching over from oral pill to other methods during quarter x.

The total number of terminations during the xth quarter is then given by:

$$T_x = P_x + M_x + R_x + O_x + S_x.$$

Letting Wx denote the number of continuing users during the quarter x and i(x) denote the number of terminators during quarter x, the probability of termination due to the ith reason, where i may be P,M,R,S, or O is given by the formula:

$$q_x = (i_x/N_x^{*(T)}).$$

where $N_x^{*(T)} = N_x^{(T)} - W_x/2$ is the number of user months of exposure to risk of termination.

The probability of termination due to any of the reasons

$$q_x^{(T)} = q_x^{(P)} + q_x^{(M)} + q_x^{(R)} + q_x^{(S)} + q_x^{(O)},$$

and the quarterly continuation rate for the xth quarter is

$$p_x^{(T)} = 1 - q_x^{(T)}$$

The continuation rate at the end of the xth quarter of use of oral pill is

$$P_x^{(T)} = \Pi\, p_x^{(T)}.$$

FIRST-SEGMENT CONTRACEPTION

The reference period for first-segment use of contraception was the three-year period between January, 1983 and December, 1985. First-segment use refers to a period of time within the reference period during which a user uninterruptedly used a method of contraception. December, 1985 was set as the cut-off point for first-segment use of contraception.

Out of 8541 ever-married women, 91.6 percent were currently married and 8.4 percent were divorced, separated, or widowed at the time of interview. For first-segment use of contraception all the ever-married women were considered to take into account all the women who were exposed to first-segment use during the 1983-85 period.

Table 1A shows the first-segment use of contraception among ever-married women under 50 years of age by method. It is evident from the table that 18.6 percent of the first-segment users used modern methods while 6.0 percent used traditional methods. From Table 1B current use of contraception shows 18.4 percent and 6.9 percent using modern and traditional methods respectively. Hence the percentage of users of any method during the first-segment period, among ever-married women, was 24.6 percent, as compared to 25 percent among the currently married women. All of the ever-married women were not exposed to first-segment use of contraception because some divorce, separation, or widowhood took place before the reference period, 1983-85. In that case these percentages are somewhat underestimated because some women who did not have any need for use of contraceptive were included in the denominator as women eligible to have used contraception.

Among the ever-married women, 2104 were found to be first-segment users compared to 1979 current users. This discrepancy indicates that the assumption of no deaths among ever-married women who used contraception might have little effect on the overall estimates. Furthermore, since the bulk of mortality to women in this age group occurs during pregnancy or childbirth (pregnancy-related mortality) and since women who were using contraception were not exposed to the risk of pregnancy-related mortality, continuation rates are not likely to be distorted by exclusion of women who used contraception for part of the reference period but died before close of the reference period.

A comparison of first-segment use and current use by method shows that oral pill users dropped from 6.7 percent for first-segment use to 5.1 percent for current use. Tubectomy use increased from 6.5 percent to 7.8 percent between the two periods. For other methods the rates were almost the same between the two time periods of use.

CURRENT USE

Table 2 shows the percent distribution of first-segment users of contraception by current use of family planning methods, controlling for first-segment method. Current use marks the status of use and nonuse at the time of interview. A time lag separates current use status from status at the end of the first-segment reference period; consequently, a number of women who terminated use of a method during the first-segment period might have become acceptors of a new method and have used this method continuously up to the date of interview.

The proportion of current users of contraception included:

(i) continuing users from first-segment methods;

(ii) those first-segment users who terminated their use of a particular method later readopted that method or began practicing a new one.

Among first-segment users of contraception about two-thirds of the oral pill and condom users were currently using family planning methods, whereas about three fourths of the first-segment users of IUD and safe period were current users of family planning methods. The largest portion of first-segment users who were also current users belonged to the "others" category (83.1 percent).

CHANGE IN METHOD

The percent distribution of first-segment users who changed methods by method using at the end of the period of reference is shown in Table 3. Among the first-segment users, all of the sterilization acceptors were still using this method at the end of the reference period (1). About 87 percent of the safe period users and 84 percent of those

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1. Most recent use or current use refers to respondent's use at the time of the interview, hence the explanation given earlier about the current use of contraceptives is also applicable here.

categorized in the "others" category were using the same method. About 74 percent, 70 percent, and 73 percent of the IUD, condom, and oral pill users, respectively, were continuing users of the same method. Slightly less than one-sixth of IUD users changed their method from IUD to oral pill. The percentage of first-segment oral pill users who were using IUD at the end of the reference period was about 5 percent. Similarly, switch-over from condom to oral pill was about twelve percent in contrast to about seven percent from oral pill to condom. Sterilization gained 2.6 percent from switch-over from oral pill, 1.9 percent from "others", and 1.7 percent from safe period. The overall increase in number of acceptors of tubectomy from first-segment to most recent period of use was from 32.0 percent to 37.0 percent (Table 4). Use of IUDs increased between first-segment and current period from 5.4 to 5.7 percent. No substantial decline took place for condom, safe period, and "others". Use of oral pill, on the other hand, shrank from 27.2 percent to 20.3 percent between the end of first-segment period and date of interview.

REASONS FOR CURRENTLY NOT USING ANY FAMILY PLANNING METHODS

Data were not available for reasons for terminating use of first-segment method from the 1985 CPS. However, as a distant surrogate we can use the method-specific distribution of reasons for current non-use among current non-users who were first-segment users, controlling for first-segment method.

Table 5 gives a loose idea about the reasons for first-segment drop-outs. From Table 5 we observe that, with the exception of IUD, all other terminations occurred primarily for reasons associated with additional children, such as desire for additional children, currently breastfeeding, or post-partum abstinence. For users of condom and safe period the percentages attributable to these reasons were 79.3 percent and 77.7 percent respectively, whereas for oral pill and "others" the percentage of terminations caused by reasons related to additional children was about 62 percent. Among IUD users the largest proportion of terminations (about 46 percent) occurred for health reasons or fear of side effects. It is noteworthy that even for IUD users the reasons related to additional children are a major cause of dropout.

Table 6 presents the percent distribution of continuing users at cut-off and termination points during the reference period for various first-segment methods. For all methods the percent of continuing users exceeded 50 percent of total users. The largest proportion of continuing users were obviously sterilization acceptors (93.3 percent) with only

five recorded cases of method failure. About 70 percent of "others" and 67 percent of safe period users were continuing to use these methods at the cut-off point. About 60 percent of the IUD users and around 50 percent of the condom and oral pill users were found to be continuing users at the cut-off point.

Table 7 presents the method-specific pattern of terminations. More than 40 percent of the terminations took place during the first six months of duration of the first-segment method for "others" (51.9 percent), condom (50.0 percent) and oral pill (41.9 percent). A little more than one fourth (28.9 percent) of the IUD users had terminated use of their first-segment method during the first six months of use. More than 60 percent of the terminations occurred during the first twelve months of use of condoms (81.9 percent), "others" (68.8 percent), and oral pill (62.6 percent). Among safe period terminations about 58 percent took place during the first twelve months of first-segment use. About one-tenth of IUD terminations of use occurred during 31 to 36 months of duration; the vast majority occurred at much shorter durations.

FIRST-SEGMENT CONTINUATION RATES AND THEIR DIFFERENTIALS

This section presents first-segment continuation rates for selected characteristics of respondents. Characteristics analyzed include place of residence, age of respondent, number of living children, desire for additional children, educational attainment of respondent, educational attainment of husband, electricity in own house, employment status of respondents, and landownership of family. The tables accompanying this section present differential continuation rates by method and by characteristic for intervals within the 36 month reference period.

First-Segment Continuation Rates

First-segment continuation rates per 100 acceptors by various methods are shown in Table 9. If 100 acceptors begin using a method at time 0, then after six months we expect that about 90 users will still be using safe period and IUD, while 84 will be using "others". Most of the drop-outs are expected to be users of oral pill (22 percent) and condom (25 percent).

After 12 months of use IUD, safe period, and "others" are expected to retain 80 of the initial 100 acceptors. The rates of drop-out for oral pill and condom during the first year of use are 45 and 37 respectively. After two years the pattern remains almost the same, with two-thirds of the

IUD, safe period, and "others" users, and less than half of the acceptors of pill and condom still using their first-segment method.

At the end of 36 months a different pattern is observed. Although more than 60 percent of "others" users are expected to use their first-segment methods at 36 months, for IUD the continuation rate is 43; only two points more than for condom. The continuation rate for oral pill users is the lowest, at 34 continuing users per 100 acceptors.

As mentioned in the quality of data section, respondents grossly overreported past use. Consequently, continuation rates are also overestimated. The consistently high rates for safe period and for "others" results from such overreporting.

Laing (1984) observed from Philippines data that the rhythm methods are not appropriate for younger couples, who usually have a high coital frequency. In terms of contraceptive effectiveness this type of natural family planning method is less reliable. To ensure avoidance of accidental pregnancy more effective methods should be suggested to those women who are seriously thinking about limiting family size.

Place of Residence

From Table 10 it is clear that the twelve month continuation rates for oral pill, condom, and IUD users were higher for urban areas. The reverse was true for safe period and "others". However, it is impossible to tell whether this outcome reflects true patterns of use or differentials patterns of reporting by place of residence.

The continuation rate was highest for urban IUD acceptors (84 per 100), followed by rural acceptors of safe period and "others" (about 80 per 100). Rural users of oral pill and condom had the lowest continuation rates, at 54.3 and 63.8 percent respectively.

Fairly large differentials appeared between rural and urban residents for all methods. For condom, the rural rate was 54.3 percent while the urban rate was 64.2 percent. For "others" the rural rate was 79.6 percent while the urban rate was 64.8 percent. Variations by place of residence for oral pills, and IUD were not as substantial.

Age of Respondent

Table 11 provides twelve-month continuation rates per 100 acceptors by age of respondent. The continuation rates appear to have a direct relationship with age. As age of respondents increases continuation rates increase. The exception in the case of IUD within the 30 to 34 age group may be attributable to the small number of cases. The estimates for condom and IUD for the age groups 35 to 39 and 40 to 49 are not shown here because of small numbers of cases (less than 20).

Exceptions in increasing continuation rates with age were also observed for "others" and safe period users in the age groups 30-34 and 40-49. For these methods the younger users had higher continuation rates. It is surprising that users of safe period and "others" below age 30 should continue naural family planning for twelve months without any interruption. The only explanation here is that the estimates are influenced by gross overreporting for these methods.

Number of Living Children

From Table 12 we may draw a general conclusion that continuation rates are directly related to number of living children for all methods except IUD. Estimates of continuation rates for IUD among respondents having numbers of living children 0-1 or six or more, as well as estimates for condom for respondents having 6 or more children, are excluded because of the small numbers of cases.

For oral pill, the continuation rate gradually increased from 55.1 for respondents having 0-1 children to 71.3 for respondents with 4 or 5 children. Similarly, for safe period, the continuation rate increased from 65.1 percent for women with one child to 88.3 for women with 4 to 5 children. For condom and "others", the continuation rate rose until respondents had three living children, then the rate declined. For condom there was sharp rise in the continuation rate from 39.8 percent for respondents with 0-1 living children to 62.7 percent for those having 2 or 3 living children. For IUD the continuation rates declined slightly, from 83 percent for women having 2-3 living children to about 80 percent for women having 4-5 living children.

If the decline in IUD continuation rates with number of living children is considered as a sampling fluctuation then Table 12 supports the hypothesis that women with more living children would be more conscientious about continued

effective use of family planning methods. Laing (1984) observed a similar relationship in the Philippines.

Desire for Additional Children

Continuation rates appear to be higher for women who did not want additional children than for women who did, irrespective of first-segment method (Table 13). The difference in the continuation rates was substantial for condom users (43.1 for those desiring more children, 65.5 for those not desiring additional children). For all other methods the variations were not large. This outcome is surprising given the expected influence of desire for more children on continued use of contraception. Laing noted a similar pattern in the Philippines (1979).

Educational Attainment of Respondents

Not steadfast conclusion emerges from analysis of continuation rates by level of education of the respondents (Table 14). As education increased from no schooling to primary schooling, continuation rates increased for oral pill and "others" but decreased for condom, IUD, and safe period. For oral pill users the continuation rate for secondary level and above remained below 60 percent, in contrast to 62.4 percent for no schooling and 68.6 percent for primary level of education. For condom, however, respondents with secondary school education had substantially higher continuation rates (65.0 percent) than women having lower levels of education (54.6 percent to 56.9 percent). Safe period continuation rates consistently decline from 81.8 percent for respondents with no education to 78.6 percent among women with primary education to 73.3 percent for secondary level of education.

Educational Attainment of Husband

Educational attainment of husband appeared to be almost unrelated to the continuation rate of a family planning method (Table 15). For oral pill, continuation rates among women with husbands having primary or higher of schooling were within the range of 66 to 68 percent. For women with husbands who had never been to school, the rate was 61.6 percent. For condom, an increase from 43.8 for husbands with no education to 58.7 percent for men with college level and above was observed, but the increase from no schooling to secondary level of schooling was not substantial. Given the small numbers of respondents in the highest educational categories, the sharp increase in this category does not necessarily reflect reality. For IUD, safe period, and "others" the same patterns hold but small cell size preclude

generalizing these results to the population as a whole.

Electricity in Own House

The respondents belonging to families having electricity in their home appeared to have greater continuation rates for oral pill, condom, and IUD while continuation rates were lower for safe period and "others", as compared to the respondents not having electricity in their own home (Table 16). Differential patterns for electricity are similar to those for place of residence; however, variations in continuation rates for oral pill, condom, and IUD were much higher by electrification status than by place of residence. For instance, among the respondents having electricity, continuation rates for condom were about 72 per 100 acceptors compared to about 50 per 100 acceptors for those not having electricity. For IUD, rates varied from 90.9 for those having electricity in their own home to 76.6 percent for those not having electricity in their own home. If electrification is thought of as a component of modernization, then the findings of this study support the hypothesis that modernization can initiate institutional changes which favour the small family norm (Whitney, 1976; Lapham and Mauldin, 1985).

Employment Status of Respondent

Small cell sizes for employed women prevent comparison of continuation rates for employed and unemployed women. Among unemployed women, however, we may examine continuation rates by method (Table 17). Safe period has the highest continuation rate (93 per 100 acceptors), followed by IUD (78.7 percent). The continuation rates for condom and oral pill were relatively low, at 57.8 and 66 percent respectively.

Land Ownership of Family

Except for IUD, every method had higher continuation rates for women from landowning families than for women from non-landowning families (Table 18). The variations between the two groups were pronounced for safe period and condom. For safe period the rate was about 93 percent for respondents whose families owned land, while the rate was only 78.4 percent for respondents from non-landowning families. For condom the rates varied from 60.9 percent to 49.1 percent for women from landed and landless families respectively. Rates for oral pill and IUD did not vary substantially. These patterns indicate that women from landowning families tend to be more conscientious about continued use of family planning. A possible explanation for this variation may be differential

quality of services by socio-economic status. Schuler et al. (1985) observed that quality of services is positively associated with the socio-economic status of the client in Nepal.

MULTIPLE DECREMENT LIFE TABLE FOR ORAL PILL

Table 19 presents the multiple decrement life table for first-segment users of oral pill by reasons for current non-use of family planning methods. As mentioned earlier, small cell frequencies for each cause by duration render this table appropriate for only very limited uses. Similarly, readers should interpret data on reasons for nonuse carefully. As mentioned earlier, the CPS did not collect direct data on reasons for termination of first-segment method. This study substitutes reasons for current non-use for reasons of first-segment termination. Keeping these limitations in mind, Table 19 shows only a general pattern of decrement.

It is evident from the table that up to a twelve-month duration of use of oral pill, switch-over from oral pill to other methods remained the single-most important reasons for non-use of oral pill. Switch-over was followed by reasons related to additional children. Between thirteen and twenty-two months of use, reasons related to additional children appear to be the most important reason for termination. After 22 months most terminations results from switch-overs, until 34 to 36 months, when they may be attributed to medical reasons.

CONCLUSION

This paper provides continuation rates by method for Bangladesh. It then identifies differential patterns of continuation rates by method and selected characteristics. The findings of this paper should be of use to policy makers, in identifying appropriate target groups for each method.

Data limitations restrict the findings of this paper somewhat. Respondents overreported past use of methods in the 1985 CPS. Overreporting of traditional methods, such as safe period, was unrealistically high. Use of "others" methods, which includes withdrawal, abstinence, etc., also appears overreported.

A further problem is lack of information on reasons for termination of use. The 1985 CPS collected a history of contraceptive use for the period between January, 1983 and December, 1985. Terminations within this period are known but reasons for termination are not. As a substitute, the paper uses the pattern of reasons for not currently using

contraception, controlled for first-segment method use.

Despite data limitations, a number of useful findings emerged from the analysis. For one, a marked variation appeared between first-segment and most recent use of methods such as oral pill and sterilization. The percentage of sterilization acceptors increased while the percentage of oral pill users declined substantially. this decline is attributable to switch-over from oral pill to other me' thods Thus, as a first-segment method, oral pill appears quite popular. In terms of continued use, however, the effectiveness of oral pill diminishes rapidly. Other methods had almost the same proportions using at both first-segment period and most recent use.

The pattern of reasons for current non-use among women who were first-segment users is the expected one for Bangladesh. Except for first-segment IUD users, women most frequently gave reasons related to additional children as the main reason for not currently using a method. For first-segment users of IUD, health reasons were the main factors for current non-use. These findings indicate that respondents generally use nonpermanent methods of family planning for birth spacing.

A number of patterns appeared when differential continuation rates were calculated for various socio-economic and demographic characteristics. Age and number of living children are directly related to continuation rates. Since an older woman is expected to have more children than a younger counterpart, these two factors tend to have a similar relationship with continuation of family planning methods. The direct relationship between number of living children and continuation rate supports the hypothesis that women with relatively more children have higher continued use of family planning methods. Educational attainment of respondents and their husbands do not show any association with continued use of contraceptive methods in Bangladesh. However, place of residence and electricity in own house have a substantial impact on the continuation of contraceptive use. Both the direction and magnitude of continuation differentials by these variables are similar. Another indicator of economic status, landownership, shows higher continued use of family planning methods among women from landowning families than among women from landless families.

For three of the four variables discussed above, higher continuation rates accompany higher socio-economic status. This finding is quite interesting in light of a growing international consensus that beyond some limit a family planning program cannot be successfully implemented if

socio-economic level is very low (Whitney, 1976; Lapham and Mauldin, 1985). The large differentials in continuation rates by household electrification status, residence, and landownership may indicate that this hypothesis may be partially true in Bangladesh. Similar continuation rates for all levels of education, however, would argue against such a theory.

Another possible explanation for variations in continuation rates by socio-economic status is that wealthier clients may receive better treatment by clinic staff and fieldworkers. Evidence exists that socio-economic status of a client and quality of treatment are positively associated (Schuler et al. 1985). If this pattern is true in Bangladesh it is not surprising that women of higher status have higher continuation rates. Again, however, the lack of a discernible pattern in continuation rates by education must be taken as evidence against such an hypothesis.

Continuation rates are lower, irrespective of method, for women desiring additional children than for women who do not desire additional children, but this magnitude is relatively small (with the exception of condom). This finding implies that desire and lack of desire for additional children have almost the same impact on a woman's continued use of contraception.

The results of this analysis have several implications for the family planning program in Bangladesh. In the past, the program has emphasized permanent methods of tubectomy and vasectomy. These methods are attractive only to older women of relatively high parity. From 1983 to 1985 the proportion of sterilization acceptors among users of modern methods declined, indicating the need to popularize other methods of contraception. In doing so, the program should identify target groups on the basis of differentials in duration of use by method and various characteristics. For example, younger couples should be encouraged to accept pills and condoms, while older couples with many children should be motivated to accept more permanent methods such as IUD or sterilization. Policy makers should note that for first segment IUD users who were not using a method at time of interview, health reasons were the most frequently given reasons for current non-use. An effort should be made to improve IUD insertion and follow-up services so that drop-outs related to health problems are minimized.

Another point that emerges from this analysis is the link between long durations of contraceptive use and socio-economic status. Women from landowning families, from urban

areas, and from homes with electricity had longer durations of use than women from landless families, from rural areas, or from non-electrified homes.

Policy makers should consider two potential interpretations of this pattern. First, there may be some point beyond which effective use of contraception cannot increase or fertility decrease unless economic development occurs. Second, women of higher socio-economic standing may obtain better health and family planning services than women from less advantaged backgrounds. Family planning officials should continue to emphasize to clinic staff and field workers the need to provide a consistently high quality service to all clients regardless of socio-economic status.

Table 1a

First Segment Use of Contraception Among Ever Married Women Under 50 Years of Age, by Method

Contraception Status	Number of Ever Married Women	Percent
Modern Methods	1589	18.6
Oral pill	573	6.7
Condom	151	1.8
Vaginal method	23	0.3
Injection	45	0.5
IUD	113	1.3
Tubectomy	556	6.5
Vasectomy	118	1.4
MR	10	0.1
Traditional Methods	515	6.0
Safe period	328	3.8
Withdrawal	60	0.7
Abstinance	27	0.5
Others	100	1.2
Any Method	2104	24.6
No Method (including breast feeding and pregnancy)	6437	75.4
Total	8541	100.0

Table 1b

Curent Use of Contraception among Currently Married Women Under 50 Years of Age, by Method, CPS, 1985

Contraception Status	Number of Currently Married Women	Percent
Modern Methods	1439	18.4
Oral pill	399	5.1
Condom	139	1.8
Vaginal method	15	0.2
Injection	37	0.5
IUD	113	1.4
Tubectomy	615	7.8
Vasectomy	121	1.5
Traditional Methods	540	6.9
Safe period	298	3.8
Withdrawal	71	0.9
Abstinence	41	0.5
Others	130	1.7
Any Method	1979	25.2
No Method	5860	74.8
Total	7838	100.0

Mitra and Associates, Bangladesh Contraceptive Prevalence Survey-1985 Key Tables, (Dhaka: Mitra and Associates, 1987).

Table 2

Percent Distribution of First Segment Users of Contraception by Current Use of Family Planning Method, Contolling for First Segment Methods

Current Use of FP Method	First segment method				
	Oral pill	Condom	IUD	Safe period	Others
Yes	64.6	69.2	74.1	78.5	83.1
No	35.4	30.8	25.9	21.5	16.9
Total	100.0	100.0	100.0	100.0	100.0
N	573	151	113	328	266

Table 3

Percent Distribution of First Segment Users Who Changed Method, by Method Currently Using, Controlling for First Segment Methods

First Segment Method	Method Currently Using						
	Oral pill	Condom	IUD	Steri-liza-tion	Safe Period	Others	Total
Oral pill	72.6	6.8	5.1	2.6	4.3	8.5	100.0
Condom	11.5	69.7	5.1	1.3	5.7	6.7	100.0
IUD	15.4	6.7	73.8	0.8	1.6	1.6	100.0
Sterilization	-	-	-	100.0	-	-	100.0
Safe period	1.7	1.5	0.8	1.7	87.2	7.2	100.0
Others	7.3	2.9	1.8	1.9	2.3	83.8	100.0

Table-4

Percent Distribution of Users of FP Methods by First Segment and Most Recent Methods

Method	First Segment	Most Recent	Difference
Oral pill	27.2	20.3	-6.9
Condom	7.2	7.0	-0.2
Sterilization	32.0	37.0	5.0
Safe period	15.6	15.1	-0.5
IUD	5.4	5.7	0.3
Others	12.6	14.9	-0.7
Total	100.0	100.0	
N	2104	1979	

Table 5

Percent Distribution of Current Drop-outs among First Segment Users by Reasons for Currently not Using Any FP Method, Controlling for First Segment Methods

Reason for Currently Not Using any FP Method	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
Want additional children, breast-feeding post-partum amenorrhea	62.5	79.3	41.9	77.7	62.2
Health reasons, fear of side-effects	23.0	10.6	45.5	4.3	11.8
Religion, Husband objects, method not not available	5.4	6.7	4.7	8.6	9.2
Other Reasons	9.2	3.4	7.9	9.4	16.8
Total	100.1	100.0	100.0	100.0	100.0
N	149	31	22	46	30

Table 6

Percent Distribution of Continuing and Terminated Users for Various First Segment Methods

Status	First Segment Methods					
	Oral pill	Condom	Sterilization	IUD	Safe period	Others
Continuing	50.4	51.0	99.3	58.9	67.4	70.3
Termination	49.6	49.0	0.7	41.1	32.6	29.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	573	151	673	113	328	226

Table 7

Percent Distribution of Terminations by Duration of Use, Controlling for First Segment Methods

Duration of Use (Month)	Oral pill	Condom	Sterilization	IUD	Safe period	Others
1-6	41.9	50.0	20.0	28.9	28.8	51.9
7-12	20.7	31.9	20.0	17.8	28.8	16.9
13-18	11.6	5.6	60.0	2.2	13.5	6.5
19-24	12.3	11.1	-	20.0	15.4	15.6
25-30	9.1	1.4	-	20.0	7.7	6.5
31-36	4.5	-	-	11.1	5.8	2.6
Total	100.1	100.0	100.0	100.0	100.0	100.0
N	284	74	5	46	106	79

Table 8

Percent Continuing Users at Cut-off Point by Duration of Use of Contraception, Controlling for First Segment Methods

'Duration' (Month)	First Segment Methods					
	Oral pill	Condom	Sterilization	IUD	Safe period	Others
1-6	23.8	18.3	2.4	15.7	17.2	20.4
7-12	16.7	18.3	6.5	18.3	14.1	21.0
13-18	10.7	14.3	6.5	10.7	5.5	5.9
19-24	10.7	15.7	9.6	16.7	13.1	8.6
25-30	3.8	2.6	5.9	1.6	3.1	2.7
31-36	34.3	30.8	69.2	37.1	47.0	41.4
Total	100.0	100.0	100.1	100.1	100.0	100.0
N	289	77	668	66	221	187

Table 9

First Segment Continuation Rates Per 100 Acceptors by Various Methods

Month	Number continuing per 100 acceptors				
	Oral pill	Condom	IUD	Safe period	Others
0	100	100	100	100	100
6	78	75	88	90	84
12	63	55	79	79	78
18	57	52	78	73	75
24	47	42	66	66	67
30	38	41	52	62	63
36	34	41	43	58	62
N	573	151	113	328	266

Table 10

Twelve-Month Continuation Rates Per 100 Acceptors by Place of Residence, Controlling for First Segment Methods

Place of Residence	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
Rural	63.8	54.3	77.6	79.4	79.6
Urban	68.7	64.2	83.8	70.5	64.8
N	573	151	113	328	266

Table 11

Twelve Month Continuation Rates Per 100 Acceptors by Age, Controlling for First Segment Methods

Age	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
< 25	52.3	45.2	71.1	68.0	68.0
25-29	65.0	63.1	78.8	79.3	81.0
30-34	70.3	85.4	72.3	80.8	70.8
35-39	71.8	(-)	(-)	93.8	83.4
40+	85.1	(-)	(-)	81.4	93.6
N	573	151	113	328	266

Note: Parentheses denote the number of cases less than 20.

Table 12

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Number of Living Children, Controlling for First-Methods

Number of living children	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
0-1	55.1	39.8	(-)	65.1	68.4
2 - 3	67.4	62.7	83.0	80.0	81.1
4 - 5	71.3	52.6	79.9	88.3	77.3
6+	67.6	(-)	(-)	77.0	83.6
N	573	151	113	328	266

Note: Parentheses denote the number of cases less than 20.

Table 13

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Desire for Additional Children, Controlling for First Segment Methods

Desire for Additional Children	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
Yes	62.2	43.1	(-)	73.2	75.9
No	69.1	65.5	79.0	79.5	80.5
N	573	151	113	328	266

Note: Parentheses denote the number of cases less than 20.

Table 14

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Education of Respondent, Controlling for First Segment Methods

Education of Respondent	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
No schooling	62.4	56.9	81.1	81.8	78.2
Primary	68.6	54.6	73.5	78.6	81.4
Secondary	56.7	65.0	80.2	73.3	71.3
College and above	58.6	(-)	(-)	(-)	(-)
N	573	151	113	328	266

Note: Parentheses denote the number of cases less than 20.

Table 15

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Education of Husband, Controlling for First Segment Methods

Education of Husband	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
No schooling	61.6	43.8	81.2	79.3	75.4
Primary	68.1	45.9	(-)	75.4	80.4
Secondary	66.2	48.8	79.0	80.5	82.4
College and above	67.4	58.7	90.5	81.7	79.9
N	573	151	113	328	266

Note: Parentheses denote the number of cases less than 20.

Table 16

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Electicity in Own House, Controlling for First Segment Methods

Electricity in own house	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
Yes	70.7	71.9	90.9	71.2	63.7
No	61.7	49.5	76.6	80.5	88.2
N	573	151	113	328	266

Table 17

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Employment Status of Respondent, Controlling for First Segment Methods

Employment status of respondents	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
Employed with cash	58.2	(-)	(-)	(-)	80.4
Employed without cash	(-)	(-)	(-)	(-)	(-)
Unemployed	66.0	57.8	73.7	92.7	77.8
N	573	151	113	328	266

Note: Parenthesis denote the number of case less than 20.

Table 18

Twelve Month Continuation Rates Per 100 Acceptors of First Segment Method by Landownership of Family, Controlling for First Segment Methods

Landownership of family	First Segment Method				
	Oral pill	Condom	IUD	Safe period	Others
Yes	66.1	60.9	79.7	92.7	79.9
No	62.8	49.1	84.9	78.4	71.5
N	573	151	113	328	266

Table 19

Multiple Decrement Life Table for First Segment Users of Oral Pill by Reasons for Current Non-use of FP Methods-CPS, 1985

Month (x,x+n)	(p) $q_{n\,x}$	(m) $q_{n\,x}$	(r) $q_{n\,x}$	(s) $q_{n\,x}$	(O) $q_{n\,x}$	(T) $q_{n\,x}$	(T) $p_{n\,x}$	(T) P_{x}
1 - 3	0.0468	0.0162	0.0054	0.0629	0.0054	0.1367	0.8633	0.8633
4 - 6	0.02246	0.0067	-	0.0670	0.0067	0.1050	0.8950	0.7727
7 - 9	0.0133	0.0027	0.0027	0.0398	0.0027	0.0612	0.9388	0.7254
10-12	0.0363	0.0121	0.0060	0.0665	-	0.1209	0.8791	0.6377
13-15	0.0370	0.0074	-	0.0296	-	0.0740	0.9260	0.5905
16-18	0.0297	0.0169	-	0.0169	-	0.0635	0.9365	0.5530
19-21	0.0530	0.0048	-	0.0193	0.0048	0.0819	0.9181	0.5077
22-24	0.0286	0.0057	0.0057	0.0571	0.0057	0.1028	0.8972	0.4555
25-27	0.0344	0.0138	-	0.0344	0.0069	0.0895	0.9105	0.4147
28-30	-	-	-	0.0866	0.0079	0.0945	0.9055	0.3755
31-33	0.0092	0.0092	0.0092	0.0461	-	0.0737	0.9263	0.3479
34-36	-	0.0762	-	0.0571	0.0190	0.1523	0.8477	0.2949

Note: p,m,r,s and o are reasons for current non-use of FP method, grouped as follows:

p - Pregnancy related reasons such as want additional children, breastfeeding, post-partum amenorrhoea,

m - Medical reasons such as, health reasons and fear of side-effects

r - Various constraints such as, religion, husband objects, method not available

s - Change of method from oral pill

o - Other reasons

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Chapter Six

CHARACTERISTICS OF BREASTFEEDING IN BANGLADESH

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INTRODUCTION

Recent research has identified breastfeeding as a major topic of interest because of its manifold implications for maternal and child health. Evidence indicates that breastfeeding can provide an adequate nutrient source for child survival (Huffman and Lamphere, 1984). In addition, breastfeeding provides protection against pregnancy by increasing the duration of postpartum amenorrhea, thereby lengthening the birth interval (Smith, 1985). Also, breastfeeding exhibits a negative association with contraceptive use (Millman, 1985).

In a 1981 publication, Bongaarts and Jain identified four factors that explain almost all the variance in the fertility levels of populations. These factors are:

(i) the proportions married among females;

(ii) the prevalence of contraception;

(iii) the incidence of induced abortion;

(iv) the fertility-inhibiting effect of breastfeeding.

Breastfeeding can play a major role in fertility regulation but before the mid-seventies data was not sufficient to identify differential cross-cultural patterns or the exact nature of the relationship between breastfeeding and fertility.

The 1976 World Fertility Surveys provided data from which analysts conducted a cross-cultural analysis of breastfeeding and its determinants. Since 1976 considerable research has focused on identifying patterns in breastfeeding around the world. This research has uncovered a variety of trends in prevalence and duration of breastfeeding in developed, newly industrialized, and developing nations. Smith (1985) observed an increase in breastfeeding among educated women in the western part of the United States in the late 1960's. This increase spread over the entire country in the next decade. Similar trends were observed in northern European countries. In developing countries, increases in education and urbanization led to decreases in the duration of

breastfeeding (Smith, 1985). In Thailand and Malaysia, Huffman and Lamphere (1984) observed declines in breastfeeding following improvements in the standard of living. Huffman and Lamphere hypothesize that breastfeeding may not be an important determinant of child mortality under modernizing conditions. In Taiwan and Thailand, the average duration of breastfeeding dropped by five months over a decade. Declines in duration of breastfeeding were especially significant among urban residents and better-educated women (McCann et. al. 1981).

Until the 1985 Contraceptive Prevalence Survey little data existed on breastfeeding in Bangladesh. Using 1985 CPS data, this paper subdivides respondents by various socio-economic and demographic characteristics. For each subgroup the paper calculates both average duration of breastfeeding and breastfeeding continuation rates. These differential patterns of breastfeeding among various groups of women allow identification of the determinants of breastfeeding in Bangladesh. Unfortunately, except for the 1976 BFS, no comparable data on breastfeeding in Bangladesh exists from earlier periods, thus this paper does not examine trends in breastfeeding.

DATA AND METHODS

This study uses data from the 1985 Contraceptive Prevalence Survey. The weighted sample included 8541 ever-married women, out of which 7822 were currently married. Interviewers collected information on breastfeeding status of the youngest child from currently married women desiring additional children and having at least one living child under five. A total of 2644 respondents provided information. Of these 2644 women, 488 had stopped breastfeeding their youngest child by the date of interview. Interviewers asked these women (referred to as terminating cases) how long they had breastfed the child.

The subsample of women from whom data were collected proved a serious limitation for the study. Estimates are based only on information from women meeting three criteria:

(i) currently married;

(ii) having at least one living child no older than five years;

(iii) desiring additional children.

To the extent that the behaviour and characteristics of women meeting these criteria deviate from the behaviour and

characteristics of other women, the estimates in this study will tend to be biased. Another limiting factor for the study is lack of direct data on duration of breastfeeding for women who were still breastfeeding their youngest child at the date of the interview. For the purpose of this study, duration of breastfeeding for these women is estimated as age of the youngest child. This method assumes that mothers of these children breastfed without interruption from date of birth to date of interview. Out of 2644 women, 2156 were breastfeeding at the date of interview and are termed continuing cases. Breastfeeding durations for these women are counted as completed months.

Table 1 shows the frequency distribution of terminated cases and the mean age of youngest child by duration of breastfeeding. It is evident that the percent distribution of children by duration shows no pattern. However, the mean age of youngest child (mean duration of breastfeeding in this case) increases from 24.5 months for duration of less than 6 months to 50.8 months for duration of 36 to 60 months. Given the inconsistency in the age distribution of youngest children, the estimates provided from this set of data should be used and interpreted carefully.

Various methods exist for estimation of average duration of breastfeeding. One of the simplest methods is to accept the median duration of breastfeeding. However, because age of youngest child does not exceed five years and because mean and median age for terminated cases would not differ substantially, this paper uses the arithmetic mean for terminated cases. No reliable method exists for calculating average durations for continuing cases, thus average durations from terminated cases provide better estimates of average national durations than estimates obtained by combining continuing and terminated cases. To incorporate data from continuing cases this paper estimates continuation rates at various durations of breastfeeding using the life table approach described in Chapter 5.

Another limitation imposed on this paper by the 1985 CPS data relates to the definition of breastfeeding. In ascertaining durations of breastfeeding, interviewers asked only one question. No supplementary questions were asked. Thus, estimates presented here give only a very broad idea about the pattern of breastfeeding in Bangladesh.

AVERAGE DURATION OF BREASTFEEDING

Table 2 shows the average duration of breastfeeding in Bangladesh as obtained from various sources. Many studies provide estimates of the mean and median durations of

breastfeeding on the basis of BFS data. Of the six duration estimates found in Table 2, five derive from 1976 BFS data. The last estimate is the duration calculated in this paper from 1985 CPS data. Lestaeghe's estimate as cited from Huffman and Lamphere (Table 1 p. 107, 1984) is the highest (31 months) followed by the median and mean estimates of Bongaarts and Jain (1981), 29 months and 28.5 months respectively. However, Bongaarts and Jain's figures derive from open birth interval data. The mean and median duration of breastfeeding for 1976, based on closed birth intervals, are 23.6 and 23.8 months, respectively (Jain and Bongaarts 1981; Ahmed and Kabir, 1986) The estimated mean duration for 1985 based on terminated cases was 22.6 months. If this estimate is compared with the closed birth interval estimated provided by Jain and Bongaarts and Ahmed and Kabir then durations appear to have declined by about one month. It is difficult to say whether the decline results from a real change or from sampling and nonsampling errors.

Demographic Characteristics

Table 3 presents the mean duration of breastfeeding by selected demographic characteristics. Although we present estimates based on total and continuing cases, the differential analysis relies mainly on terminated cases for reasons discussed above. The demographic characteristics considered for differential analysis are age of respondent, total number of living children, number of children dead and current status of pregnancy.

Age of Respondent

The mean duration estimates increased up to age 40, from 18.47 months to 25.86 months. Small numbers of cases in the age groups 40 and above make the estimates for these age groups unreliable. Women below age 20 breastfed their children for substantially shorter durations than did women above 20 years of age. Women between the ages of 20 and 34 did not exhibit marked differences in duration by age, however duration increased slightly for women 35 to 39, in comparison to women 30 to 34. From this table we can conclude that mean duration of breastfeeding increases with age of mother.

Total Number of Living Children

The mean duration of breastfeeding generally increased with an increase in the total number of living children. The exception observed for women having three living children might be attributed to small numbers of terminated cases for this group. An increase in duration of breastfeeding from

20.64 months for women having one living child to 23.66 months for women having two children was similar to the increase in duration for women aged less than 20 to women aged 20-24 years. The longest duration of breastfeeding was observed among women having five or more children. Hence, according to these estimates, the more living children a woman has the longer her durations of breastfeeding. A similar finding was observed among American mothers (Hirschman and Butler, 1981).

Number of Children Dead

Total number of dead children appears to have almost no relationship with duration of breastfeeding. A small difference in duration for women with no dead children in comparison to women with at least one dead child does exist. Women with no dead children breastfeed an average of one month less than do women with one or more dead children. The increase in mean duration for women having four or more dead children is probably not reliable given the small numbers of terminated cases for this group.

Current Status of Pregnancy

Women who were pregnant at the time of interview had breastfed their child for 24.4 months, about 2.5 months longer than those who were not pregnant at interview. It is noteworthy that currently pregnant continuing women had a mean duration of about 27 months while currently pregnant women who had already terminated breastfeeding their youngest child had a duration of only 24.36 months. For continuing cases, mean duration of breastfeeding is a close approximation of the birth interval. Thus, breastfeeding may be functioning to space births by extending the birth interval.

Socio-Economic Characteristics

Table 4 presents the mean duration of breastfeeding by selected socio-economic characteristics for continuing and terminated cases. Socio-economic variables considered in this study are education of respondent, education of her spouse, religion, employment status of respondent, land ownership of family, electricity in own house, and place of residence.

Education of Respondent

It is clear from Table 4 that the mean duration of breastfeeding is negatively related to education of respondents. Mean duration decreases with an increase in level of education. The respondents having no schooling

breastfed their child, on average, about 26 months, followed by the respondents with some primary school education (20.6 months). Women who had college and above level of education breastfed their children for the shortest durations--about 15 months. Similar differences in average duration of breastfeeding by education were observed in Thailand's 1984 Contraceptive Prevalence Survey (Knodel, Kamnuansilpa, and Chamratrithirong, 1985).

Education of Husband

Education of husband also shows an inverse relationship with mean duration of breastfeeding. The table shows a decrease in the mean duration of breastfeeding from about 25 months for women having husbands with no schooling to about 17.6 months for women having husbands with an educational level of college and above. This relationship may result from the high level of association between level of education of a respondent and level of education of her spouse.

Religion

A moderate difference exists between the breastfeeding practices of Muslim and Hindu women. Among the Muslim women, mean duration of breastfeeding averaged 22.3 months, while for Hindus the figure was about 25.2 months.

Employment Status of the Respondent

Unemployed women in Bangladesh breastfeed their children for an average of 22.5 months, which is very similar to the overall mean duration. Unfortunately, small numbers of terminated cases for women employed with cash and for women employed without cash render unreliable average durations calculated for these groups.

Land Ownership of Family

Variation in mean duration of breastfeeding between women from families owning land and women from families not owning land is not substantial. Thus, land ownership does not appear to alter breastfeeding practices of mothers.

Electricity in Own House

Electricity in own house emerged as one of the variables within which average durations of breastfeeding varied most substantially. Mean duration of breastfeeding for women from homes with electricity was about 17.4 months, whereas for women from homes without electricity average duration was only 25.3 months. It is interesting that the effect of

electricity on duration is similar in magnitude to the effect of place of residence on average durations.

Place of Residence

Table 4 shows a marked variation in mean duration of breastfeeding for urban and rural residents. Respondents from urban areas had a mean duration of about 18 months, which was about 7 months shorter than the mean duration for respondents from rural areas. This differential is similar to a substantial rural-urban differential observed among Thai women (Knodel, Kamnuansilpa, and Chamratrithirong, 1985), and to a general negative effect of urban residence on duration of breastfeeding to which Huffman and Lamphere refer in their remarks (Huffman and Lamphere, 1984).

CONTINUATION RATES

The previous section of this paper presented socio-economic and demographic variations in mean duration of breastfeeding separately for continuing and terminated cases. The differential analysis relied upon duration estimates obtained from terminated cases. While data limitations made this approach necessary, it resulted in the elimination of information from a large proportion of continuing cases.

This section adopts a life table approach to analysis of differential patterns of breastfeeding. The life table method incorporates data from both terminated and continuing cases and provides an opportunity to see if patterns observed in the previous section hold for the much larger combined sample. One problem with this method is that its results are largely influenced by the censored observations, which occur in far greater numbers than do terminated observations.

Demographic Characteristics

Age of Respondent

No substantial variation emerged in the continuation rates of breastfeeding among various age groups at 6, 12, and 18 months of duration (Table 5). At 24 months of duration, however, a decline was observed from 83 percent continuation for respondents aged less than 20 to 73 percent continuation for respondents in the age group 25 to 29. For the age group 30 to 34, the continuation rate at 24 months was 74 percent; Above age 35 it increased to 86 percent. At 36 months the pattern by age remained almost the same as that observed at 24 months. Continuation rates decreased with age for the first three age groups, then consistently increased with age for women above 30.

The pattern of continuation rates by age differed from the age pattern of average durations of breastfeeding. Continuation rates indicate that younger and older women breastfeed for longer than do women in the middle of the age range. Mean duration estimates, however, indicate that duration consistently increases with age. In interpreting continuation rates one must keep in mind that the rates are overweighted by distributions of censored cases.

Number of Living Children

No clear pattern of variation in continuation rates by number of living children emerges from Table 6. Below durations of 24 months continuation rates vary only slightly with number of living children. At 36 months of duration, rates were more than 50 percent for women having less than two living children, then declined to only 44 percent for women having four living children. The continuation rate was highest (68 percent) for women with five living children, then declined to only 52 percent for women with six children. Marked differences in rates exist by number of living children at 24 months of duration, but one may discern no clear pattern. Variations observed between findings for average duration and for continuation rates largely result from the pattern of censoring incorporated into estimates for continuation rates.

Number of Children Dead

The total number of dead children does not show any specific relationship with the duration of breastfeeding. Almost 90 percent of the women, irrespective of number of children dead, continued breastfeeding up to 18 months. At 36 months of duration more than 50 out of 100 women continued to breastfeed (Table 7).

Current Status of Pregnancy

The continuation rates for women not pregnant at the time of interview were consistently higher than those for women who were pregnant at all durations of breastfeeding. Table 8 shows that at 36 months of duration 26 percent of currently pregnant women continue breastfeeding, while 55 percent of women not currently pregnant continue. These findings conflict with the pattern established by data on average duration of breastfeeding by status of pregnancy, where, among terminated cases, women who were currently pregnant had longer average breastfeeding durations than women not currently pregnant. The continuation rates presented here seem more plausible given the commonly

accepted relationship between breastfeeding and lengthened birth intervals. If breastfeeding truly functions to delay births, we would expect higher continuation rates for respondents who were not currently pregnant. Unfortunately the set of data under consideration here provides no means of solving this dilemma.

Socio-Economic Characteristics

Education of the Respondent

Continuation rates show an inverse pattern with level of education (Table 9). This relationship holds at all levels of duration for all levels of education and is similar to the pattern established from data on mean duration. For example, at 36 months of duration, continuation rates vary from 54 percent for women with no schooling to 15 percent for women with college and higher levels of education. At 18 months of duration, rates range from 94 percent for women with no schooling to 68 percent for women with college education and above.

Education of Husband

Table 10 shows continuation rates by educational attainment of husband and duration of breastfeeding. As with education of respondent, an inverse relationship between education of husband and continuation rate emerges. For example, at 36 months of duration more than one half of respondents with husbands that had no schooling continued to breastfeed their children, whereas only 25 percent of women whose husbands had been to college were still breastfeeding.

Religion

The direction of differential continuation rates by religion is clear from Table 11. At every duration Hindus are more likely to continue breastfeeding their children than are Muslims. The magnitude of the differential increases with level of duration. At a duration of six months a difference of only 2 points exists between rates, while at 36 months the difference has grown to 12 percentage points.

Employment Status

The pattern of continuation rates by employment status of the respondent varies with level of duration. For six to eighteen months of duration, continuation rates are about even for all women. At 24 and 30 months of duration, women employed for cash are more likely to continue breastfeeding than are women employed without cash or unemployed women. At

36 months of duration, however, women employed for cash are the least likely to continue breastfeeding. This evidence supports findings in Sri Lanka that women's work away from home has a significant effect in reducing breastfeeding (Akin et al., 1981).

Land Ownership of Family

The previous section concluded that average duration of breastfeeding was unrelated to landownership of the family. This finding appears to hold for continuation rates as well (Table 13). Rates change very little up to durations of 18 months, beyond which women from families owning land have slightly higher rates than do women from landless families.

Electricity in Own House

Continuation rates show marked differences with presence or absence of electricity in the respondent's home (Table 14). At every level of duration, rates are higher for women without electricity than for women with electricity. For instance, at a two year duration of breastfeeding 59 percent of those with electricity and 83 percent of those without electricity are expected to continue breastfeeding. At 36 months the difference in rates is 20 percentage points: 34 percent for women with electricity; 54 percent for women without electricity. This pattern partially supports observations of Huffman and Lamphere (1984) that modernization may be accompanied by decreases in duration of breastfeeding.

Place of Residence

Among possible indicators of level of modernization, urban-rural residence is a particularly sensitive one. Given the higher levels of modernization found in urban areas, it is no surprise that urban residents have consistently and substantially lower continuation rates than do rural residents (Table 15).

CONCLUSIONS

Developing countries are experiencing a transition in breastfeeding practice with modernization. Declines in duration of breastfeeding often accompany improvements in standard of living, employment status of women, and education. In Bangladesh, where breastfeeding continues to play an important role in the dynamics of child survival and birth intervals, a transition in breastfeeding practices has important implications.

This paper uses two indicators of breastfeeding practices: (i) average durations of breastfeeding; and (ii) continuation rates by duration. For each indicator differential patterns by various socio-economic and demographic characteristics are computed. Though data limitations result in some conflicting findings between the two measures, a definite pattern can be established for most of the characteristics.

Among the respondents, older women breastfeed for longer average durations than younger women. Similarly, a direct relationship emerges between duration of breastfeeding and total number of living children. Women who had no children die breastfed for slightly shorter durations than did women who had a child die, but among women with one or more dead children, total numbers dead did not affect average durations.

Findings by current status of pregnancy were inconclusive. Women who were pregnant at time of interview had lower continuation rates than did women who were not pregnant. For terminated cases women who were pregnant at interview had longer average durations of breastfeeding than women who were not pregnant. Further study is needed to ascertain the true relationship between current pregnancy status and duration of breastfeeding.

The hypothesis that modernizing conditions have a negative effect on duration of breastfeeding seems applicable to Bangladesh. Women with higher levels of education, women with more highly educated husbands, working women, and women living in urban areas breastfeed for shorter durations than their counterparts. Land ownership status of the family does not make any difference in the breastfeeding practice of women. Religion has a slight effect, with Hindus breastfeeding for longer periods than Muslims.

The findings presented in this paper are important for policy makers in many respects. Breastfeeding practice as a means of birth spacing and lowering child mortality should be reconsidered in the context of differential socio-economic patterns prevalent in Bangladesh. Changes taking place in demographic and socio-economic characteristics of the population will have implications for breastfeeding practice, which in turn has implications for levels of fertility and child mortality. These relationships must be considered in developing an integrated approach to reducing levels of fertility and mortality in Bangladesh.

Table 1

Frequency Distribution of Terminated Cases and Mean Age of Youngest Child by Duration of Breastfeeding, CPS, 1985

Duration of Breastfeeding (in month)	N	Mean Age of Youngest Child (in month)
< 6	67	24.58
6 - 12	47	32.64
12 - 18	68	36.31
18 - 24	112	37.49
24 - 30	90	42.21
30 - 36	64	46.47
36 - 60	40	50.83
Total	488	38.23

Table 2

Average Duration of Breastfeeding in Bangladesh from Various Sources

Source	Year	Measure	Duration (in_month)
Lesthaeghe (1)	1976	Mean	31.0
Jain and Bongaarts (2)	1976	Mean (open birth interval)	28.8
Jain and Bongaarts (2)	1976	Median (open birth interval)	29.0
Jain and Bongaarts (2)	1976	Mean (closed birth interval)	23.6
Ahmed and Kabir (3)	1976	Median (closed birth interval)	23.8
Shuaib and Islam	1985	Mean	22.6

Source: 1. Huffman and Lamphere (1984)
2. Jain and Bongaarts (1981)
3. Ahmed and Kabir (1986)

Table 3

Mean Duration of Breastfeeding by Selected Demographic Characteristics for Continuing and Terminated Cases

Mean Duration in Months (N is Given within Parenthesis)

Demographic Characteristics	Total		Continuing		Terminated	
Age of Respondent						
<20	13.35	(660)	12.80	(596)	18.47	(64)
20-24	17.66	(1006)	16.39	(807)	22.80	(199)
25-29	18.58	(591)	17.15	(450)	23.14	(141)
30-34	19.02	(264)	17.72	(206)	23.64	(58)
35-39	20.41	(93)	18.82	(72)	25.86	(21)
40-44	18.45	(22)	16.28	(18)	25.25	(4)
45-49	17.88	(8)	18.00	(7)	17.00	(1)
Total Number of Living Children						
1	16.89	(1105)	15.96	(886)	20.64	(219)
2	17.50	(747)	16.10	(608)	23.66	(139)
3	17.20	(400)	15.55	(331)	25.14	(69)
4	16.53	(189)	15.00	(155)	23.50	(34)
5+	16.18	(203)	14.78	(176)	25.30	(27)
Number of Children Died						
0	16.64	(1709)	15.51	(1409)	21.97	(300)
1	17.72	(592)	16.22	(474)	23.76	(118)
2	17.52	(202)	16.43	(167)	22.77	(35)
3	17.52	(79)	15.80	(60)	22.95	(19)
4+	18.85	(62)	16.72	(46)	25.00	(16)
Current Status of Pregnancy						
Pregnant	25.22	(224)	27.07	(71)	24.36	(153)
Not Pregnant	16.22	(2394)	15.32	(2061)	21.83	(333)
Don't Know	20.58	(26)	21.04	(24)	15.00	(2)

Table 4

Mean Duration of Breastfeeding by Selected Socio-economic Characteristics for Continuing and Terminated Cases

Mean Duration in Months (N in Parenthesis)

Socio-economic Characteristics	Total		Continuing		Terminated	
Education of Respondent						
No Schooling	17.23	(1692)	15.76	(1446)	25.84	(246)
Primary	17.02	(622)	16.09	(494)	20.60	(128)
Secondary	16.35	(255)	15.11	(171)	18.87	(84)
College and Above	13.86	(58)	12.68	(28)	14.97	(30)
Others	18.53	(17)	18.53	(17)	-	(-)
Education of Husband						
No Schooling	17.41	(1252)	16.20	(1079)	24.98	(173)
Primary	17.02	(565)	15.59	(474)	24.45	(91)
Secondary	17.06	(529)	15.67	(406)	21.63	(123)
College and Above	15.45	(243)	14.09	(149)	17.60	(94)
Others	15.33	(54)	14.10	(47)	23.57	(7)
Religion						
Islam	16.72	(2382)	15.42	(1936)	22.34	(446)
Hinduism	1984	(256)	18.82	(215)	25.17	(41)
Others	21.17	(6)	19.40	(5)	30.00	(1)
Employment Status of Respondent						
Employed with Cash	18.81	(111)	16.69	(86)	26.12	(25)
Employed without Cash	16.30	(20)	16.50	(16)	15.50	(4)
Unemployed	16.96	(2513)	15.72	(2054)	22.47	(459)

Table 4 Continued

Socio-economic Characteristics	Total		Continuing		Terminated	
Land Ownership of Family						
Yes	17.30	(1621)	15.96	(1306)	22.89	(315)
No	16.59	(1023)	15.48	(850)	22.06	(173)
Electricity in Own House						
Yes	15.89	(510)	15.15	(344)	17.42	(166)
No	17.30	(2134)	15.89	(1812)	25.27	(322)
Place of Residence						
Rural	17.41	(2027)	16.02	(1720)	25.19	(307)
Urban	15.79	(617)	14.71	(436)	18.20	(181)
Total	17.03	(2644)	15.76	(2156)	22.60	(488)

Table 5

Breastfeeding Continuation Rates Per 100 Women by Age of Respondent and Duration of Breastfeeding

Duration of Breastfeeding

Age	N	6	12	18	24	30	36
<20	660	97	95	92	83	81	61
20-24	1006	97	94	89	80	65	48
25-29	591	96	94	91	73	59	47
30-34	264	99	95	88	74	66	50
35+	123	97	96	90	86	74	62

Table 6

Breastfeeding Continuation Rates Per 100 Women by Number Living Children and Duration of Breastfeeding

Duration of Breastfeeding

Number of Living_children	N	6	12	18	24	30	36
1	1105	96	92	86	77	65	51
2	747	98	96	92	87	73	52
3	400	99	97	94	82	62	49
4	189	99	96	90	76	61	44
5	121	98	98	91	78	68	68
6+	82	99	99	93	85	73	52

Table 7

Breastfeeding Continuation Rates Per 100 Women by Number of Children Died and Duration of Breastfeeding

Duration of Breastfeeding

Number of Children Died	N	6	12	18	24	30	36
0	1709	97	94	90	79	66	50
1	592	98	96	96	76	62	47
2	200	98	95	86	80	69	56
3	79	99	91	87	68	51	44
4+	62	98	94	91	74	58	51

Table 8

Breastfeeding Continuation Rates Per 100 Women by Current Status of Pregnancy and Duration of Breastfeeding

Duration of Breastfeeding

Current Status of of Pregnancy	N	6	12	18	24	30	36
Pregnant	224	95	89	77	55	38	26
Not Pregnant	2394	97	95	91	82	71	55
Don't Know/Not Decided	26	96	96	96	96	78	78

Table-9

Breastfeeding Continuation Rates Per 100 Women by Educational Attainment of Respondents and Duration of Breastfeeding

Duration of Breastfeeding

Educational Attainment of Respondent	N	6	12	18	24	30	36
No Schooling	1692	99	98	94	84	71	54
Primary	622	96	92	87	74	60	50
Secondary	255	92	86	76	60	44	30
College and Above	58	80	72	68	44	39	15
Others	17	(-)	(-)	(-)	(-)	(-)	(-)

Note: Parentheses denote the number of cases less than 20.

Table 10

Breastfeeding Continuation Rates Per 100 Women by Educational Attainment of Husband and Duration of Breastfeeding

Duration of Breastfeeding

Eductional Attainment of Husband	N	6	12	18	24	30	36
No schooling	1252	99	98	93	85	73	56
Primary	565	98	96	93	82	65	53
Secondary	529	97	91	86	71	59	46
College and Above	243	95	90	79	59	42	25
Others	54	100	97	89	83	74	59

Table 11

Breastfeeding Continuation Rates Per 100 Women by Religion of Respondent and Duration of Breastfeeding

Duration of Breastfeeding

Religion(1)	N	6	12	18	24	30	36
Islam	2382	97	94	89	77	63	48
Hindusm	256	99	96	93	85	78	60

(1) Other religions are excluded due to the very small number of cases.

Table 12

Breastfeeding Continuation Rates Per 100 Women by Employment Status of Respondents and Duration of Breastfeeding

Duration of Breastfeeding

Employment Status	N	6	12	18	24	30	36
Employment with Cash	111	96	95	92	85	74	44
Employed without Cash	20	95	95	84	54	54	54
Unemployed	2513	97	95	90	78	64	50

Table 13

Breastfeeding Continuation Rates Per 100 Women by Land-ownership of Family and Duration of Breastfeeding

Duration of Breastfeeding

Land Ownership of Family	N	6	12	18	24	30	36
Yes	1621	97	95	89	77	63	49
No	1023	96	92	89	69	58	44

Table 14

Breastfeeding Continuation Rates Per 100 Women by Electricity in Own House and Duration of Breastfeeding

Electricity in Own House	N	Duration of Breastfeeding 6	12	18	24	30	36
Yes	510	90	82	75	59	48	34
No	2134	99	98	94	83	70	54

Table 15

Breastfeeding Continuation Rates Per 100 Women by Place of Residence and Duration of Breastfeeding

Place of Residence	N	Duration of Breastfeeding 6	12	18	24	30	36
Rural	2027	99	98	93	83	68	56
Urban	617	92	85	78	64	53	32

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Chapter Seven

DETERMINANTS OF ACCEPTANCE, CONTINUATION, AND TERMINATION OF FAMILY PLANNING METHODS IN BANGLADESH

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INTRODUCTION

Despite three decades of effort to reduce fertility in Bangladesh through promotion of family planning, targeted declines have yet to be achieved. The contraceptive prevalence rate is increasing but the impact of this rise is not clearly reflected in the level of fertility. Examination of factors associated with acceptance, termination, and duration of contraceptive use may help explain this enigma.

Several studies, in Bangladesh and in other countries, have identified important variables in decisions to accept, continue, and terminate use of family planning methods. A factor that continues to emerge as important in such decisions is the extent of knowledge of different methods of contraception. Family planning programs cannot hope to achieve high levels of effective contraceptive use if potential acceptors are not aware of the full range of contraceptive methods (particularly modern methods) available to them (Basu, 1984; Nair and Smith, 1984; Schuler et al., 1985). Nair and Smith observed that disapproval of contraception is the second most common reason for non-use of contraception in Bangladesh (desire for additional children is first). Much of this disapproval may result from limited knowledge about the variety of contraceptive methods available and their relative advantages and disadvantages.

Another factor with important implications for contraceptive use is child survival. If the child survival hypothesis is correct, decreasing infant and child mortality may increase motivation to use family planning (Taylor, Newman, and Kelly, 1976).

Similarly, factors associated with modernization (electrification, urbanization, education) may have an important effect on decisions related to use of contraception. Modernization factors can initiate institutional changes that favour birth spacing, and delay age at marriage and first birth. Additionally, economic factors such as employment of women and landownership may also affect acceptance, termination, and use duration of family planning methods.

Differential analysis of contraceptive practice in relation to the variables discussed above is of limited use. When these variables are considered individually their relative importance is obscured. Conclusions pertaining to the relative importance of the above measures are possible only when one model incorporates all variables of interest.

This paper uses linear logistic regression and proportional hazards models to identify the factors associated with acceptance, termination, and duration of use of contraceptives. Data are from the common sample of the 1983 and 1985 Contraceptive Prevalence Surveys. Limitations of this data constrain the results but underlying relationships of the variables can be determined with some degree of certainty.

DATA

Data collection for the 1985 CPS occurred between December, 1985 and July, 1986. Households selected for the 1985 CPS came from the same 200 areas (120 rural, 80 urban) as households selected for the 1983 CPS (for additional details see Mitra and Kamal, 1985; Mitra, 1987). Total respondents in the eligible woman sample numbered 9117 for the 1983 CPS, compared to 10,305 total respondents in the eligible woman sample for the 1985 CPS. In 1983 and 1985 interviews with a subsample of couples provided additional information on contraceptive use.

Because the 1983 and 1985 CPS samples come from the same 200 areas, a certain proportion of women gave interviews in both years. The total number of common respondents was 759, of which 606 were part of the eligible woman sample. The remaining 153 women were part of the couple sample. For the purposes of comparison with other chapters, we consider only women interviewed as part of the eligible woman sample. Consequently, the total number of respondents analyzed is 606.

In order to ascertain the degree of similarity between the common sample and the 1983 and 1985 national samples, we compare selected characteristics of the respondents. Table 1 shows the percentage distribution of respondents by various socio-economic and demographic characteristics. Characteristics selected for comparison are place of residence, age of respondent, educational attainment, employment status, desire for additional children, number of living sons, number of children dead, landownership of family, and religion.

For the common sample, 87.1 percent and 12.9 percent of the respondents are from rural and urban areas respectively. In comparing age distributions among the samples we find a larger proportion of respondents above age 25 in the 1985 common sample than in the 1983 common sample or in the 1983 and 1985 national samples. This result is expected because of the two year increase in age between 1983 and 1985 among women interviewed in the common sample. Distribution of respondents by religion and by family landownership status does not differ substantially among samples.

In both the 1985 common sample and the 1985 national sample a slightly higher proportion of women (around 92 percent) are unemployed than in the 1983 common sample and national sample (around 89.3 percent). The proportion of women desiring additional children declines from about 33 percent in the 1983 common sample and the 1983 and 1985 national samples to 28 percent in the 1985 common sample. Distribution of respondents by number of living sons and number of dead children differs somewhat between the common and national samples because fewer women in the common sample are childless (the NA category refers to women who have never had a live birth).

Table 2 presents the contraceptive method mix for the national samples and the common sample. The proportion of users in the 1983 national sample is about 19 percent, whereas it is 23.6 percent for the 1983 common sample. The proportion of users in the 1985 national sample is 25.3 percent, whereas it is 29.2 percent for the 1985 common sample. Within the common sample a marked increase between 1983 and 1985 appears in use of oral pill, safe period and sterilization, while use of withdrawal decreases.

The composition of the common sample does not vary substantially from that of the 1983 and 1985 national samples. Therefore, estimates based on the common sample may be generalized to the population as a whole.

METHODS

This study uses logistic regression and proportional hazards models to identify determinants of contraceptive use. Data used for first-segment durations of use in the proportional hazards model covers a period from the beginning of 1983 to the end of 1985. Chapter 5 defines first-segment duration of use, explains its computation, and discusses overreporting of first-segment durations of use in the 1985 CPS. To control for overreporting, this analysis considers only respondents who reported current use in the 1983 CPS.

Application of the logistic regression model allows identification of:

i) factors important in beginning use of family planning methods; and .
ii) risk factors in termination of use of family planning methods.

Application of the proportional hazards model provides an overview of factors influencing risk of terminating use of contraceptives at varying durations. Although small numbers of cases constrain the utility of the analysis, the results enable policy makers to better understand variables that influence contraceptive use-effectiveness (in terms of duration of use).

Linear Logistic Regression

The general logistic model expresses a qualitative dependent variable as a function of several independent variables, both qualitative and quantitative (Fox, 1984). Let Y be a dichotomous dependent variable with probabilities P and 1-P for values 1 and 0 respectively. For the ith observation, $Pr(Yi=1)=Pi$ and $Pr(Yi=0)=1-Pi$. Here $Pi/(1-Pi)$ is the odds ratio that Yi is 1 rather than 0. For the ith observation the vector of independent variables can be expressed as:

$$Xi1,\ Xi2, \ldots\ldots\ldots, Xip$$

where $X1, X2, \ldots\ldots\ldots, Xp$ are p independent variables under consideration. Then $Xi'B$ is the regression equation where B is a vector of regression parameters. The linear logistic is

$$Pi = 1/(1+e^{-Xi'B}) \text{ or } \log(Pi/(1-Pi))=Xi'B.$$

This paper fits a logistic model to two dependent variables. For the first model the dependent variable consists of respondents who were nonusers of contraception in 1983 and who remained nonusers or began using contraception by 1985. In this case

$Pi = Pr(Yi=1)$ - Probability that the ith respondent who did not use any family planning method in 1983 became an acceptor during the 1983-85 period and reported current use of contraception in the 1985 interview; and

$1-Pi=Pr(Yi=0)$ - Probability that the ith respondent who did not use any family planning method in 1983 also reported not using in 1985.

For the second model the dependent variable consists of women who reported current use of a contraceptive in 1983 and who were either still using a method or who had terminated use in 1985. Here,

$P_i = Pr(Y_i=1)$ - Probability that the ith respondent who reported current use of a method in 1983 stopped contracepting and reported non-use of contraception on 1985; and

$1-P_i = Pr(Y_i=0)$ - Probability that the ith respondent who reported current use of contraception in 1983 also reported current use of contraception in 1985.

From the first model we may identify factors associated with acceptance of family planning methods. From the second model we may identify factors associated with termination of use of family planning. For the logistic regressions we use SAS PROC LOGIST to run stepwise and full model estimates (see SUGI supplemental Library User's Guide, 1986).

The Proportional Hazards Model

This study fits the proportional hazards model developed by Cox (1972) and modified by Breslow (1974) to deal with tied data. For computational details see Herrell (1984). A hazard function is defined as the failure rate during a very short interval $(t, t+\Delta t)$ conditional upon the individual surviving to the beginning of the interval t. For instance, for interval $(t, t+\Delta t)$, the hazard function can be expressed as

$$\lambda(t) = \lim_{\Delta t \to 0} \frac{P\,(\text{an individual fails to continue using during the interval } (t,\ t+\Delta t))}{\Delta t}$$

If we consider T_i as the failure time for the ith individual and $X_i = (X_{i1}, X_{i2}, \ldots, X_{ip})'$ is the vector of independent variables or covariates associated with failure time, then the hazard function can be expressed as

$$\lambda i(Y) = \lambda(ti;X) = \frac{f(ti;X)}{1 - F(ti;X)},$$

where f (ti;X) is the density function and 1 - F (ti;X) is the survival function of Ti. The distribution of T in this case is dependent on the covariates X1,X2,.....Xp (Miller, 1981). Cox's proportional hazards model expresses the hazard function $\lambda(ti;X)$ with respect to the covariates X1,X2,.....Xp as follows:

$$\lambda i(Y) = \lambda(ti;X) = e^{Xi'B} \lambda o(Y),$$

where B is a row vector of regression parameters, Xi is the vector of independent variables for the ith observation, and $\lambda o(Y)$ is the hazard function if all variables equal zero. To eliminate $\lambda o(Y)$ Cox proposed use of conditional probabilities based on the above hazard function such that

P (failure of the ith individual at time ti, given that one failure in the risk set occurs at time ti) =

$$e^{Xi'B} / \sum_{j \in Ri} e^{Xj'B}$$

where Ri consists of the respondents exposed to the risk of failure at time ti .

In this study failure time corresponds to duration of first-segment use of a method of contraception during the 1983-85 period.

RESULTS

As mentioned above we use two logistic regression models and one proportional hazards model to identify factors influencing acceptance or termination of use of contraception. The first logistic regression model analyzes acceptance of family planning, while the second model considers termination of contraceptive use for the period 1983 to 1985. The proportional hazards model examines factors influencing the risk of terminating contraceptive use at varying durations.

Variables selected for all three models are age of respondent (AGE), educational attainment (HCPR), place of residence (AREA), religion (RR), employment status (EMP), landownership of family (LAND), total number of living sons (TNLS), total number of children dead (TNCD), desire for additional children (WANTC), electricity in own home (ELEC), and number of modern methods known (NMMK). Values for all of

these variables come from the 1983 CPS, except for electricity, which is available only from 1985 data.

Acceptance of Family Planning Methods

Table 3 presents logistic regression results with acceptance of family planning as the dependent variable. The full model, consisting of all the variables listed above, is significant at the 1 percent level. Observations numbered 271. None of these 271 women were using contraception in 1983. All were eligible for use in both 1983 and 1985. Of these 271 women, 58 began using contraceptives before the 1985 CPS interview date, while 213 remained nonusers.

In the full model, five variables emerged as significant. These variables are age, total number of living sons, total number of children died, desire for additional children, and number of modern methods known. All variables except total number of children died are significant at the 1 percent level. Probability of acceptance of contraception increases with total number of living sons and number of modern methods known (1). Probability of acceptance decreases with age, desire for additional children, and total number of children died.

It is interesting that place of residence, religion, and electrification are not significant in this model although they appear to have a substantial relationship with use of contraception in bivariate analysis. In Chapter 5, place of residence and electrification of home had similar impacts, in both direction and magnitude, on duration of contraceptive use. These variables, however, do not appear significant in affecting the decision to accept family planning methods. A possible explanation may be that factors such as total number of living sons, total number of children dead, desire for additional children, and number of modern methods known vary by place of residence and electrification. In other words, other variables explain the effect of place of residence and electrification on acceptance of family planning methods.

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1. Here total number of modern methods known represents awareness of the existence of these methods rather than a concrete understanding of the manner by which they reduce the chance of conception. See the 1985 CPS Final Report for further details.

Termination of Contraception

An understanding of factors associated with termination of contraception is important in analyzing constraints that prevent achievement of family planning targets.

Though the results of our study give some picture of these factors, our findings should be interpreted cautiously because of small sample size. Only 128 women satisfied conditions for this analysis (use in 1983; continued use or non-use in 1985). Of these 128 women, 36 terminated use of family planning before the date of interview in 1985, while 92 women reported using family planning at the date of interview. The full model, consistig of all the variables, was not significant. Upon application of a stepwise estimation procedure we obtained a significant model, which is presented in Table 4.

From Table 4 we see that age and family landownership exert significant influence on termination of contraceptive use. Both covariates are positively related with the risk of termination. With possession of land or an increase in age, probability of termination of use increases.

The relationship between landownership and termination results from different contraceptive method mixes for women from landowning and nonlandowning families. Among users from landowning families, 31.9 percent use IUD or sterilization, while 38.4 percent use traditional methods and 29.8 percent use injection, condom, or oral pill. Among users from non-landowning families, 62.6 percent use IUD or sterilization, while only 16.7 percent use traditional methods and 20.8 percent use oral pills or condoms. Given the concentration of users from non-landowning families among methods difficult or impossible to discontinue and the concentration of users from landowning families among methods easy to discontinue, it is not surprising that landownership is positively related to risk of termination.

Duration of Contraceptive Use

Duration of contraceptive use is a crucial link in our analysis of contraceptive practices. Chapter 5 discuses the manifold policy implications of variations in duration of use by method and by socio-economic characteristics of users. Chapter 5 also provides estimates of continuation rates for various methods, controlling for socio-economic and demographic characteristics of users. Estimates in Chapter 5 are affected by large numbers of censored observations (women who continued to use a method at the cut-off point of the contraceptive history survey). Consequently, continuation

rates presented in Chapter 5 are inadequate in identifying factors that influence duration of use.

The proportional hazards model used in this paper has several advantages over the method of estimation used in Chapter 5. First, by employing the product-limit method to estimate failure or continuation probabilities, the proportional hazards model deals efficiently with censored observations. Second, the model identifies risk factors associated with continuation or termination of family planning methods.

The proportional hazards model also has an advantage over the linear logistic regression model. The proportional hazards model is based on information on contraceptive use and termination over a two-year period. The linear logistic model, on the other hand, uses information from only two points in time. While linear logistic regression provides information on factors important in beginning or terminating contraceptive use, proportional hazards models identify factors that predict duration of use of contraception. As discussed in Chapter 5, duration of contraceptive use plays a fundamental role in the relationship between contraceptive prevalence and fertility decline.

In this section we fit a proportional hazards model to the risk of terminating use of contraception. The model uses the same set of variables mentioned above. Total number of uncensored and censored observations are 363 and 23, respectively.

Table 5 shows parameter estimates of the proportional hazards model for duration of use of contraception. Only four variables are significantly related to the risk of terminating contraception after certain durations of use. The factors that function as hazards to continued use of family planning are employment, total number of children dead, desire for additional children, and number of modern methods known. The effects are in the expected directions. Employment and number of modern methods known decrease the risk of termination of contraceptive use. Total number of children dead and desire for additional children increase the hazard of termination. Employment and total number of children dead are significant at the 5 percent level; desire for additional children and number of modern methods known are significant at the 1 percent level. Parameter estimates for the other indicators are not significant, hence we do not discuss their magnitude or direction of impact on the risk of termination.

A comparison of Tables 3 and 5 reveals that factors influencing acceptance of a method and factors influencing continuation of a method are only a little different. Employment has a significant negative relation with the risk of terminating method use but does not predict acceptance. Age of respondent, on the other hand, is negatively related to acceptance of contraception but is not important in predicting continued use of contraception.

DISCUSSION AND CONCLUSION

This paper identifies the factors associated with acceptance, termination, and duration of contraceptive use in Bangladesh. The data consists of a set of respondents interviewed both in the 1983 and 1985 Contraceptive Prevalence Surveys. A preliminary comparison of this common sample with the national sample shows that the distribution of respondents by various characteristics is quite similar, hence the results are valid at the national level. Though the data is nationally representative, small numbers of cases pose a serious limitation for the analysis.

We used two linear logistic regression models to analyze factors in the decision to accept or terminate use of family planning. The models are based on contraceptive use status at the time of interview in 1983 and in 1985. We used a proportional hazards model to analyze continuation of contraceptive use during the period 1983-85. The proportional hazards model effectively handles censored and uncensored observations.

We used linear logistic regression to identify determinants of acceptance of contraception. Significant variables are age, total number of living sons, total number of children died, desire for additional children, and number of modern methods known.

Total number of living sons positively affects the decision to use contraception. The significance of the number of living sons contradicts the finding of Nair and Smith (1984), who report that number of living sons has no substantial impact on use of contraception in Bangladesh and Thailand. However, they did observe that the number of living children was an important predictor of contraceptive use. This issue requires further examination. In Bangladesh, where average family size is large, the number of living children appears to serve as a reasonable proxy for number of living sons.

Number of modern methods known also positively affects the decision to use contraception. This finding is

consistent with other research in South Asia. Nair and Smith observed that disapproval of family planning is the second most common reason for non-use of contraceptives in Bangladesh. This disapproval exists because potential clients do not have adequate knowledge of the range of family planning methods available (Nair and Smith, 1984). Basu (1984) observed that the low rate of contraceptive use in India stems partly from lack of knowledge of modern reversible methods among potential clients. In Nepal, Schuler et al. (1985) found that inadequate transmission of information from clinic staff to clients (particularly lower-caste clients) was a significant barrier to acceptance of a family planning method. Given results of other research, our finding that knowledge of modern methods is significantly related to acceptance of contraception in Bangladesh is not surprising.

It is also not surprising that desire for additional children exerts a negative effect on the probability of acceptance of a method. Nair and Smith (1984) have shown that desire for additional children is the most common reason for non-use of contraception in Bangladesh. The negative effect of age on probability of acceptance is an interesting and somewhat unexpected finding.

This study also examines factors associated with termination of family planning methods; however, the results are affected by a small number of observations and should be interpreted with great caution. Linear logistic regression revealed that increasing age and possession of land may increase the probability of termination of contraceptive use. The concentration of users from non-landowning families among permanent methods of contraception is a possible explanation for the positive relationship between landholding and risk of termination.

So far our discussion has focused on initiation and termination of contraceptive use. An important element of contraceptive practice is continuation of use. In analyzing factors associated with continuation, this study incorporates information on duration of use of first-segment methods during 1983-1985.

Variables significant in continued use of contraception are employment status of the woman, total number of dead children, desire for additional children, and number of modern methods known. Employment and number of modern methods known decrease the risk of termination at a given duration of use. It is not surprising that employment decreases risk of termination since holding a job may be incompatible with pregnancy and large family size.

The importance of number of modern methods known in continuation of use as well as initial acceptance is important. Women who are well-informed about the variety of methods from which they may choose are more likely to adopt a method of family planning and continue to use it. Women with inadequate awareness of family planning options (indicated by a small number of modern methods known) are less likely to initiate use of contraception or to continue use of a method they have chosen. Perhaps if these women were better informed about the range of methods available and associated advantages and disadvantages, they would be more likely to choose an appropriate method and continue to use it.

Total number of children that have died and desire for additional children are factors that significantly increase risk of termination. A woman's risk of terminating use rises with the number of her children that have died. This relationship highlights the formidable barrier that high levels of infant and child mortality pose for the family planning program.

In this study we have identified the major factors associated with initiation, continuation, and termination of contraceptive use. Because the statistical methods we have used incorporate all variables of interest into one model, our analysis reveals the relative importance of the variables. Small numbers of observations limit the utility of our study to some degree. Despite this limitation, findings have important implications for the family planning program.

First is the importance of knowledge of modern methods in both acceptance and continued use of contraception. If women do not have adequate knowledge about the range of modern methods available for use in regulating fertility, they are unlikely to accept a method or, if they do accept a method, to continue using it.

Second is the importance of decreasing child and infant mortality. If woman are to accept and continue use of family planning methods, the children they have already born must survive.

Table 1

Comparison Between Samples For Selected Socio-Economic and Demographic Characteristics of Respondents

		CPS 1983	Common Sample 1983	Common Sample 1985	CPS 1985
Residence	Rural	90.1	87.1	87.1	89.9
	Urban	9.9	12.9	12.9	10.1
Religion	Muslim	88.6	86.6	86.5	89 4
	Non-Muslim	11.4	13.4	13.5	10.6
Educational Attainment	None	68.8	70.4	72.0	69.4
	Primary	24.1	22.1	20.1	22.6
	Secondary +	7.1	7.5	7.9	8.1
Employment Status	Employed, with cash	8.7	8.4	5.6	5.8
	Employed, without cash	2.0	2.1	1.7	2.0
	Unemployed	89.3	89.3	92.7	92.1
Land Ownership	Owns Land	66.1	65.0	64.2	63.8
	Does Not Own Land	33.9	35.0	35.8	36.2
Age Group	15-19	19.8	14.2	7.4	16.0
	20-24	20.6	23.9	20.0	20.6
	25-29	19.5	21.9	22.8	20.1
	30-34	12.9	14.4	18.8	15.4
	35-39	10.9	11.2	13.5	11.9
	40-44	8.5	8.4	8.4	8.4
	45-49	7.8	5.4	9.1	7.6
Children Wanted In Future	Yes	33.0	32.7	27.9	32.3
	No	43.4	50.3	58.6	47.4
	NA/NA	24.5	16.8	13.6	20.2
Total Number of Children Died	0	40.1	43.0	41.9	41.5
	1-3	41.8	43.7	47.0	39.6
	4-6	5.0	5.8	6.1	5.5
	7+	.6	.7	1.0	.6
	NA	12.3	6.9	4.0	12.6
Total Number of Living Sons	0	17.1	15.3	14.9	15.9
	1-2	47.4	55.0	54.6	47.9
	3-4	18.3	18.5	21.4	19.3
	5+	4.9	4.2	5.1	4.3
	NA	12.3	6.9	4.0	12.6

Table 2

Comparison of Contraceptive Method Mix, Common Sample and National Samples, 1983 and 1985 Contraceptive Prevalence Surveys, Bangladesh

Method	CPS 1983	Common Sample 1983	Common Sample 1985	CPS 1985
Oral Pill	3.3	3.6	7.1	5.1
Condom	1.5	2.1	2.8	1.8
Vaginal Method	.3	0.0	0.0	.2
Injection	.2	.5	0.0	.5
IUD	1.0	1.5	1.5	1.4
Female Sterilization	6.2	6.6	9.2	7.9
Male Sterilization	1.2	1.8	2.0	1.5
Safe Period	2.4	2.6	4.1	3.8
Withdrawal	1.3	2.3	.5	.9
Abstinence	.4	.5	1.0	.5
Other	1.4	1.8	1.0	1.7
Not Applicable	80.9	76.4	70.8	74.7

Table 3

Logistic Regression Estimates
for Acceptance of Family Planning,
Common Sample from the 1983 and 1985 Contraceptive
Prevalence Surveys, Bangladesh

VARIABLE	BETA	S.E.	CHI-SQUARE	P
INTERCEPT	-0.6197	1.1199	0.31	0.5800
AGE	-0.0893	0.0321	7.72	0.0055
HCPR	-0.0776	0.0648	1.43	0.2311
AREA	0.7937	0.5441	2.13	0.1447
RR	-0.5410	0.5046	1.15	0.2387
EMP	0.2930	0.6345	0.21	0.6442
LAND	0.4597	0.4082	1.27	0.2601
TNLS	0.4191	0.1586	6.98	0.0082
TNCD	-0.4271	0.1784	5.73	0.0166
WANTC	-1.8029	0.4530	15.84	0.0001
ELEC	0.1333	0.5083	0.07	0.7931
NMMK	0.4264	0.1147	13.82	0.0002

Model Chi-Square: 68.87 with 11 Degrees of Freedom
(P = 0.0)

Table 4

Logistic Regression Estimates (Stepwise)
For Termination of Family Planning Methods,
Common Sample from the 1983 AND 1985
Contraceptive Prevalence Surveys. Bangladesh

VARIABLE	BETA	S.E.	CHISQUARE	P
INTERCEPT	-3.7777	0.9892	14.58	0.0001
AGE	0.0692	0.0278	6.21	0.0127
LAND	0.9787	0.4632	4.46	0.0346

Model Chi-Square: 11.28 with 2 Degrees of Freedom
(P = 0.0036)

Table 5

Proportional Hazards Model Estimates for
Continuation of Family Planning Methods,
Common Sample from 1983 and 1985
Contraceptive Prevalence Surveys, Bangladesh

VARIABLE	BETA	S.E.	CHI-SQUARE	P
AGE83	0.0074	0.0090	0.68	0.4101
HCPR83	-0.0175	0.0198	0.78	0.3783
AREA	-0.2044	0.1972	1.07	0.3000
MUSLIM	0.0463	0.1628	0.08	0.7759
EMP	-0.4326	0.2157	4.02	0.0449
LAND	0.0611	0.1190	0.26	0.6076
TNLS83	-0.0507	0.0479	1.12	0.2899
TNCD83	0.0865	0.0393	4.86	0.0275
WANTC	0.5298	0.1325	15.98	0.0001
ELEC	0.0113	0.1980	0.00	0.9546
NMMK83	-0.0783	0.0306	6.55	0.0105

Model Chi-Square: 54.95 with 11 Degrees of Freedom
(P = 0.0000)

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Chapter Eight

UTILIZATION OF THE PROXIMATE DETERMINANTS OF FERTILITY TO ASSESS FAMILY PLANNING PROGRAM OBJECTIVES AND PERFORMANCE

Andrew Kantner

Previous chapters of this report have generated estimates of the proximate determinants of fertility: namely, data on the proportions of women currently married, contraceptive prevalence by method, the level of annual discontinuation by method, and the average duration of breastfeeding. This information, in conjunction with independent estimates of contraceptive use effectiveness, the duration of post-partum infecundability and the induced abortion rate, provides an opportunity to investigate the role of proximate (intermediate) factors determining fertility in Bangladesh. Of particular interest to FP/MCH policy makers is the utilization of the proximate determinants to assess the pattern of association between fertility and the contraceptive prevalence rate, and to review current and projected family planning program performance.

Analysis of the proximate determinants of fertility is undertaken utilizing the Population Council Target Program developed by Bongaarts and Stover (1987). This program estimates the TFR from the following equation:

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

where:

TFR = Total Fertility Rate;

Cm = Marriage Index (Cm equals one if all women of reproductive age are married and zero if none are married);

Cc = Contraception Index (Cc equals one if no women are using contraception and zero if all women of reproductive age are using 100 percent effective contraception;

Ca = Induced Abortion Index (Ca equals one if no abortion is practiced and zero if all pregnancies are aborted);

Ci = Postpartum Infecundability Index (Ci equals one in the absence of lactation and postpartum infecundability and zero if postpartum infecundability is infinite);

TF = Total Fertility Rate estimated in the absence of the effects of the marriage pattern, contraception, induced abortion and postpartum infecundability (i.e. the level of TFR when Cm = Cc = Ca = Ci = 1). Variations in TF tend to be small and are dependent upon the three remaining proximate determinants of fertility; namely, frequency of intercourse, spontaneous abortion and sterility.

From this formulation, it is possible to estimate the level of CPR required to achieve various TFR targets. Conversely, CPR targets can be linked to resultant TFR levels. The Target Program also generates projections of the number of acceptors and users of contraception by method, and the commodity supply requirements needed to reach future TFR and CPR levels.

In this application of the Population Council Target Program, two principal analyses are presented. The first set of estimates describes the level of TFR required to attain a CPR of 40 percent (modern and traditional methods) by the year 1992. Projected annual numbers of users, acceptors and commodity supply requirements are shown. The second estimation series projects the level of TFR required to reach various CPR targets by the year 2001.

PROXIMATE DETERMINANT INPUTS UTILIZED IN THE APPLICATION OF THE TARGET PROGRAM

Tables 1-6 provide the proximate determinant inputs used to assess 1983-1992 TFR and CPR interrelations in the Population Council Target Program. Table 1 gives the total number of women of reproductive age, the proportions of women currently married and the number of currently married women of reproductive age for the period 1983-1992. These estimates are based upon projections of the 1981 Population Census that incorporate the following parameters:

Measures	1981	1986	1992
e(0)	50	51	52
Proportions Currently Married	.898	.890	.882

Female survivorship ratios corresponding to e(o) of 50, 51 and 52 years are derived from the United Nations South Asian model life table. The proportions of women currently married by age are estimated from the 1983 Contraceptive Prevalence Survey. 1981-1992 estimates are based on an assumed increase of 1 year in the average age at first marriage between 1983 and 2001. The 1981 figure of .898 is extrapolated from this trend line.

Tables 2-3 provide contraceptive prevalence estimates by method that are employed in this exercise. The 1983 and 1986 contraceptive prevalence and method mix figures are derived directly from the CPS for these years (1). Projected prevalence estimates for 1992 are geared to a moderate increase in contraceptive use between 1986-1992. The 1986-1992 method mix trend is obtained through an extrapolation of the actual change in method mix between 1983 and 1986.

Use effectiveness levels by method are given in Table 4. These values represent standard effectiveness levels for modern methods if use is continuous. Traditional method use effectiveness is essentially unknown. In this analysis, a somewhat notional figure of .600 has been adopted (2). Table 5 presents the method specific

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1. The fieldwork for the 1985 CPS was undertaken during December-April, 1986 (eligible woman sample) and May-June, 1986 (couple sample). This staggered schedule resulted from the decision to collect couple sample data once the eligible woman sample was already partially completed. Since 1985 CPS data measures reproductive behaviour occurring through mid-1986, results from the 1985 CPS are attributed to 1986 rather than 1985 in this exercise.

2. Use effectiveness as defined by Bongaarts and Stover (1986:51) is "the proportional reduction in the monthly risk of conception" rather than the more commonly encountered "one minus the annual failure rate".

annual discontinuation rates estimated in Chapter 5 of this report. These estimates, along with the underlying use effectiveness values in Table 4, determine the overall effectiveness of contraceptive use in Bangladesh.

Additional proximate determinants of fertility employed in this analysis are given in Table 6. Analysis presented in Chapter 6 found that the average duration of breastfeeding was approximately 22 months in Bangladesh. This estimate was derived from currently married women who (1) had at least one living child under five years of age, and (2) desired additional children. Thus, breastfeeding duration information was not collected from all women eligible for interview in the 1985 CPS. However, this deficiency probably does not bias 1985 CPS breastfeeding duration estimates to any great degree. The duration of postpartum infecundability implied from an average breastfeeding duration of 22 months is around 12 months (Bongaarts and Potter, 1983:25). A slight reduction in the duration of breastfeeding and postpartum infecundability is assumed for the period 1986-1992; namely, a reduction in breastfeeding duration from 22 to 21 months and a decline in postpartum infecundability from 12 to 11.8 months.

Table 6 also presents the induced abortion rate per woman utilized in this analysis (1). Unfortunately, reliable national statistics on the incidence of abortion in Bangladesh are not currently available. Data from the Demographic Surveillance System (DSS) in Matlab indicates that the annual induced abortion rate in recent years has averaged between .08 and .12 abortions per woman (e.g. see Shaikh 1983:32). However, these figures are generally thought to underestimate the actual number of abortions occurring in Matlab. Given the lack of reliable national estimates, this analysis has adopted a somewhat notional figure of .20 abortions per woman. There is no evidence that the incidence of abortion is changing in Bangladesh. Therefore, a constant induced abortion rate has been assumed for the period 1986-1992.

The final inputs required in the application of the Target Program are reasonable estimates of the level and age pattern of fertility at the beginning of the projection period (1983). As was noted in Chapter 1,

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1. The total induced abortion rate is measured in the same fashion as the total fertility rate; namely, age-specific abortion rates are summed for all women of reproductive age and then multiplied by 5 (the number of years in each five year age group).

there is considerable uncertainty surrounding these two measures. This analysis has assumed a 1983 TFR of 6.2 births per woman, an estimate essentially in line with a 1983 TFR of 6.1 derived from the Mauldin/Segal CBR of 40.9 (which in turn is obtained from the 1983 couple sample CPR of 21.7 percent using the formula CBR = 49.07 - (CPR X .43) (1).

As was also discussed in Chapter 1, the age patterns of fertility derived from the 1983 and 1985 CPS were not consistent with other evidence considered to be reliable (e.g. the age-pattern of fertility reported from the ICDDR,B Matlab Comparison Area). Therefore, 1983 and 1985 CPS age pattern data were not incorporated in this analysis. Reliance is instead placed upon the average 1981-85 age pattern of fertility reported by the BBS Sample Vital Statistics Registration System. While the level of fertility reported by the BBS may be too low, there is no strong reason to doubt the accuracy of the fertility age pattern. As Figure 1 indicates, 1983 ICDDR,B Matlab comparison area and BBS fertility age patterns are quite similar. Since BBS data is supposedly representative of the national population, it has been utilized in this application of the Target Program.

FAMILY PLANNING PROGRAM INDICATORS AND OBJECTIVES 1983-1992

Tables 7-10 present results of the Target Program incorporating an increase in the CPR from 21.7 percent in 1983 to 29.8 percent in 1986 (the actual CPS prevalence estimates for these years) and 40.0 percent by 1992. The TFRs associated with these prevalence levels are given in Table 7. Starting with a TFR of 6.2 in 1983, the implied TFR in 1986 (linked to an increase in the CPR from 21.7 to 29.8 percent) is 5.6. A TFR decline from 5.6 in 1986 to 4.8 by 1992 is consistent with an increase in the CPR from 28.9 to 40.0 percent.

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1. The 1983 TFR of 6.1 was obtained by deriving age-specific fertility rates (geared to the average 1981-85 age pattern of fertility reported by the BBS Sample Vital Statistics Registration System) that, in conjunction with the projected mid-year 1983 female population aged 15-49, generated births consistent with a 1983 CBR of 40.9.

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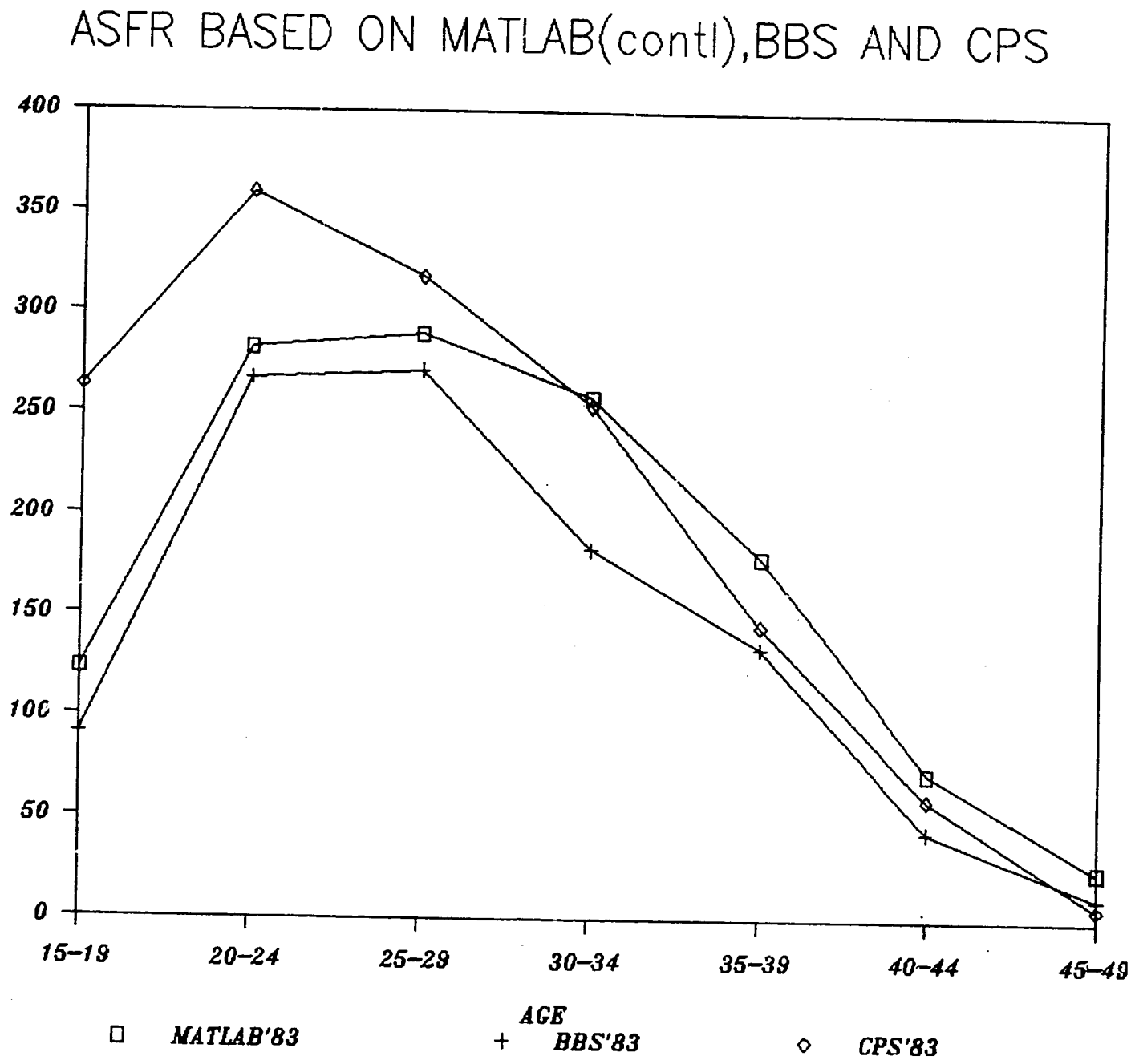
Figure 1

Comparison of Age Specific Fertility Rates from the 1983 CPS, 1983 ICDDR,B Matlab Comparison Area and the BBS Vital Statistics Registration System



One should bear in mind that projected TFR levels associated with various CPR targets are highly sensitive to the initial level and age pattern of fertility employed in running the Target Program. Since there remains much uncertainty surrounding levels and trends of fertility in Bangladesh, one must consider projected TFR figures to be suggestive rather than definitive estimates of actual fertility levels prevailing at any given point in time.

The annual percentage and number of users by method between 1983 and 1986 are given in Tables 8 and 9. These estimates correspond to the prevalence and method mix trends reported by the 1983 and 1985 CPS. Annual numbers of acceptors over the same period are provided in Table 10. Annual acceptors are determined by yearly growth in the number of users (in years t and t+1), annual method discontinuation, and aging of the population (i.e., women who attain age 50+ over the projection period must be replaced by new acceptors). Methods with higher levels of discontinuation (e.g. condoms) require relatively more new annual acceptors than methods with longer durations of use (e.g. the IUD).

The projected percentage and number of users by method needed to attain a CPR of 40.0 percent by 1992 are given in Tables 11 and 12. As noted previously, the projected method mix trend for the period 1986-92 is a linear extrapolation from 1983-86 method mix change identified in the 1983 and 1985 CPS. The total number of users needed by 1992 is 9.040 million. In other words, the number of contraceptive users in Bangladesh will need to increase by 64.3 percent between 1986-92 in order to reach a CPR of 40.0 percent by 1992.

It is anticipated that the most widely used method by 1992 will continue to be tubectomy (8.90 percent of currently married will be tubectomy users by 1992). However, oral pill, vasectomy, and condom use will increase more rapidly than tubectomy between 1986-92. By 1992, prevalence for the oral pill is projected to be 8.32 percent, vasectomy 6.10 percent, and condoms 6.16 percent. Injectables and the IUD are projected to increase in use by 1992, but will likely remain minor methods in the Bangladesh family planning program. Vaginal methods (primarily foam and jelly) will largely disappear from circulation while traditional method use will remain essentially unchanged over the 1986-92 period.

While the 1986-92 gains in prevalence shown in Table 11 may not appear substantial, given the increase in the size of the female population of reproductive age over this period, the absolute number of users that will need to be recruited annually by the family planning program is considerable (see Table 12). Between 1986 and 1992, the absolute and percentage increase in method use needed to reach 40.0 percent prevalence by 1992 is as follows:

Method	Number of Users		Percentage
	1986	1992	Change
Vasectomy	701.7	1378.6	96.5
Tubectomy	1457.8	2011.5	38.0
Injectables	93.7	280.2	199.0
IUD	256.9	433.9	68.9
Pills	938.6	1880.4	100.3
Condoms	737.2	1392.2	88.8
Vaginal Methods	52.2	.9	- 98.3
Traditional	1265.3	1662.5	31.4

The largest percentage increase will be in the use of injectables (199.0 percent), followed by oral pills (100.3 percent), vasectomy (96.5 percent), and condoms (88.8 percent). The annual number of acceptors by method corresponding to these gains in contraceptive use are given in Table 13. These substantial increases over a period of just six years constitute a major challenge for the national family planning program in Bangladesh.

The Target Program also provides estimates of future commodity supply requirements geared to an increase in CPR of 40.0 percent by 1992. Table 14 provides the annual consumption rates adopted for the four methods considered; namely, injectables (4 doses annually per user), the IUD (1.42 devices annually per user), oral pills (13.94 cycles annually per user) and condoms (180 pieces annually per user) (1). These consumption rates are based upon continuous method use over a one year period.

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1. Annual consumption rates for injectables, the IUD, and oral pills are values currently employed by the Bangladesh family planning program when procuring commodities. The annual consumption rate for condoms is based upon a study of condom use in Bangladesh by Laing and Walker, (1987).

Commodities that will need to be supplied annually to the family planning program in order to attain a 40.0 percent prevalence rate by 1992 are shown in Table 15. Between 1987-92, the procurement of injectables will need to increase by 140.0 percent, IUDs by 53.6 percent, oral pills by 76.5 percent, and condoms by 68.2 percent.

ANALYSIS OF DEMOGRAPHIC TRENDS, 1986-2001

Table 16 presents six population projections based upon different trends in family planning achievement between 1986 and 2001. These projections incorporate the following CPR outcomes by the year 2001: (1) a very rapid increase in CPR (71.8 percent, which is consistent with a replacement level TFR of 2.4); (2) a rapid increase in CPR (60 percent); (3) a moderate increase in CPR (50 percent); (4) a slow increase in CPR (40 percent); (5) a constant CPR (29.8 percent); and (6) a moderate decline in CPR (25.0 percent) (1).

All of the projections shown in Table 16 assume an increase in life expectancy from 51 years in 1986 to 54 years in 2001; a one year increase in the average age at first marriage between 1983 and 2001 (.83 years over the period 1986-2001); a decline from 21 to 20 months in the duration of breastfeeding and 11.8 to 11 months in postpartum infecundability; and a constant induced abortion rate of .20. Use effectiveness levels and discontinuation rates measured by the 1985 CPS remain constant throughout the projection period. The previously identified 1986-1992 method mix trend (extrapolated from the pattern of change between 1983-1986) is incorporated in these projections, with the 1992 method mix held constant between 1992-2001.

The Target Program is once again employed to determine the level of TFR associated with various family planning program outcomes. An age-specific component population projection program incorporating specific trends in fertility and mortality is also utilized to project the crude birth rate (CBR), crude death rate (CDR), rate of natural increase

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1. The replacement level TFR commonly cited in demographic studies is 2.1. However, in a high infant and child mortality setting such as Bangladesh (where e(o) is projected to reach only 54 years by the year 2001), the replacement level TFR is higher than 2.1. This analysis considers a TFR of 2.4 to be a closer approximation of the actual level of replacement fertility in Bangladesh.

(RNI), and the total population resulting from (1) trends in TFR derived from the Target Program) and (2) life expectancy e(o). RNI is assumed to equal the annual rate of population growth (r) since net annual international migration is not considered in this analysis (1). The projection program uses the 1981 Population Census "adjusted" age distribution, the 1981-85 average age pattern of fertility from the BBS Sample Vital Statistics Registration System (VRS), and five year age-specific survivorship ratios from the United Nations South Asian family of model life tables.

Results indicate that the 1986 CPR of 29.8 percent and TFR of 5.6 results in a CBR of 39.4, a CDR of 14.2, and an RNI of 25.2 per 1,000 population (and r = 2.52 with net international migration = 0). The total 1986 mid-year population projected from the 1981 Population Census (incorporating a decline in TFR from 6.2 to 5.6 and an increase in e(o) from 50 to 51 years) is 102.0 million.

The six projections in Table 16 outline a wide range of demographic scenarios that may unfold in Bangladesh by the end of the century. If the CPR can be raised to 71.8 percen by 2001, the TFR will decline to a replacement level of 2.4. This rapid decline in fertility will reduce the annual rate of natural increase from 25.2 to 10.3, which results in a total population of 128.8 million in 2001. On the other hand, a decline in contraceptive prevalence from 29.8 percent in 1986 to 25.0 percent in 2001 would increase the TFR from 5.6 to 5.8, the CBR from 39.4 to 44.7, RNI from 25.2 to 30.4 (r from 2.52 to 3.04), and the total population from 102.0 to 157.4 million.

These two extreme projections will probably not arise. Projections based upon slow, moderate and rapid increases in CPR are more likely to be within the realm of possibility. These projections generate TFRs ranging from 3.3-4.7, CBRs between 27.6 and 37.9, rates of natural increase from 15.6 to 24.5 percent and total population estimates between 135.5 and 148.1 million in 2001.

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1. The level of out-migration from Bangladesh, estimated to be between 50,000 and 80,000 annually, does not significantly affect the annual population growth rate (BBS, 1988:8).

It is important to note that even with significant declines in the TFR, the CBR tends to remain relatively high (thereby restraining more rapid reductions in the annual growth rate). This situation can be clearly seen in the moderate projection based upon an increase in CPR to 50.0 percent and a decline in TFR to 4.0 by 2001. Despite the significant fall in fertility, the crude birth rate remains surprisingly high (33.3 births per 1,000 population). More critically, the rate of natural increase is still slightly above 20.0 (r = over 2 percent per annum). This situation arises from the young age structure of the population (i.e. progressively larger female cohorts are entering the child bearing years) and the assumption of falling mortality, which allows more women to survive through the age range 15-49.

It is of course impossible to specify with any assured precision exactly how demographic change will unfold in Bangladesh during the remainder of this century. However, the demographic outcomes generated by the more plausible projections in Table 16 are hardly trivial to future prospects for rapid social and economic development in Bangladesh.

Table 1: Number of Women of Reproductive Age, Currently Married Women of Reproductive Age, and the Proportion of Women Currently Married, 1983-1992

Total Women of Reproductive Age (Thousands)

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
1983	4664	3838	3418	2814	2292	1941	1490	20457
1984	4947	3925	3479	2947	2360	1992	1580	21230
1985	5246	4014	3540	3087	2431	2045	1675	22038
1986	5564	4105	3603	3233	2504	2099	1776	22884
1987	5832	4349	3686	3291	2623	2162	1823	23766
1988	6113	4608	3770	3350	2748	2228	1872	24690
1989	6408	4883	3856	3410	2879	2295	1922	25654
1990	6717	5173	3945	3472	3016	2365	1973	26660
1991	7041	5481	4035	3534	3160	2436	2026	27713
1992	7009	5746	4276	3616	3218	2553	2088	28506

Married Women of Reproductive Age (Thousands)

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
1983	2845	3454	3145	2561	1994	1591	1148	16737
1984	2984	3520	3200	2682	2054	1635	1218	17292
1985	3129	3587	3256	2810	2117	1679	1292	17869
1986	3281	3655	3312	2943	2182	1725	1371	18468
1987	3400	3858	3387	2996	2287	1778	1408	19115
1988	3522	4073	3464	3050	2397	1833	1447	19787
1989	3648	4300	3543	3106	2513	1890	1486	20485
1990	3779	4539	3623	3162	2634	1948	1527	21212
1991	3913	4792	3705	3219	2760	2008	1569	21967
1992	3848	5005	3926	3294	2812	2106	1618	22609

Proportions Currently Married

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
1983	.610	.900	.920	.910	.870	.820	.770	.820
1984	.603	.897	.920	.910	.870	.821	.771	.818
1985	.596	.894	.920	.910	.871	.821	.771	.816
1986	.590	.890	.919	.910	.871	.822	.772	.813
1987	.583	.887	.919	.910	.872	.822	.772	.810
1988	.576	.884	.919	.911	.872	.823	.773	.807
1989	.569	.881	.919	.911	.873	.823	.773	.805
1990	.563	.877	.918	.911	.873	.824	.774	.803
1991	.556	.874	.918	.911	.874	.824	.774	.801
1992	.549	.871	.918	.911	.874	.825	.775	.799

Table 2: Contraceptive Prevalence by Method, 1983, 1986 and 1992

Method	1983	1986	1992
Vasectomy	2.5	3.8	6.1
Tubectomy	6.2	7.9	8.9
Injectables	.2	.5	1.2
IUD	1.0	1.4	1.9
Pills	3.3	5.1	8.3
Condoms	2.7	4.0	6.2
Vaginal Methods	.3	.3	.0
Traditional	5.5	6.9	7.4
Total	21.7	29.8	40.0

Table 3: Contraceptive Method Mix, 1983, 1986, and 1992

Method	1983	1986	1992
Vasectomy	11.5	12.8	15.3
Tubectomy	28.[illegible]	26.5	22.3
Injectables	1.0	1.7	3.1
IUD	4.6	4.7	4.8
Pills	15.2	17.1	20.8
Condoms	12.4	13.4	15.4
Vaginal Methods	1.4	.8	.0
Traditional	25.3	23.0	18.4

Table 4: Use Effectiveness of Contraceptive Methods Utilized in the Bangladesh Family Planning Program

Method	Use Effectiveness
Vasectomy	1.000
Tubectomy	1.000
Injectables	.980
IUD	.950
Pills	.900
Condoms	.700
Vaginal Methods	.700
Traditional	.600

Table 5: Annual Discontinuation Rates by Method, 1985 CPS

Method	1985
Vasectomy	.010
Tubectomy	.010
Injectables	.300
IUD	.210
Pills	.350
Condoms	.450
Vaginal Methods	.300
Traditional	.700

Table 6: Average Duration of Breastfeeding, Duration of Postpartum Infecundability, and the Induced Abortion Rate

Average Duration of Breastfeeding	
1983	22.0 Months
1986	22.0 Months
1992	21.0 Months
Duration of Postpartum Infecundability	
1983	12.0 Months
1986	12.0 Months
1992	11.8 Months
Induced Abortion Rate (Per Woman)	
1983	.20
1986	.20
1992	.20

Table 7: Total Fertility and Age-Specific Fertility Rates Corresponding to Trends in the Contraceptive Prevalence Rate, 1983-1992

		Age-Specific Fertility Rate						
	TFR	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1983	6.20	134.3	332.5	311.9	228.6	154.1	58.6	20.0
1984	6.00	129.1	323.4	303.6	221.0	148.1	55.9	19.1
1985	5.80	123.8	314.4	295.3	213.5	142.0	53.1	18.2
1986	5.60	118.5	305.3	287.0	205.9	136.0	50.4	17.2
1987	5.47	115.0	299.2	281.4	200.8	131.9	48.6	16.6
1988	5.33	111.5	293.1	275.9	195.8	127.9	46.7	16.0
1989	5.20	107.9	287.1	270.3	190.7	123.8	44.9	15.3
1990	5.07	104.4	281.0	264.7	185.7	119.8	43.1	14.7
1991	4.93	100.9	275.0	259.2	180.7	115.8	41.3	14.1
1992	4.80	97.4	269.0	253.7	175.7	111.8	39.4	13.4

Table 8: Percentage of Women Using by Method, 1983-1986

Method	1983	1984	1985	1986
Vasectomy	2.50	2.91	3.34	3.80
Tubectomy	6.21	6.81	7.37	7.89
Injectables	.22	.30	.40	.51
IUD	1.00	1.13	1.26	1.39
Pills	3.30	3.86	4.45	5.08
Condoms	2.69	3.11	3.54	3.99
Vaginal Methods	.31	.31	.30	.28
Traditional	5.49	5.98	6.44	6.85
Total	21.71	24.40	27.11	29.80

Table 9: Annual Number of Users by Method, 1983-1986

Method	1983	1984	1985	1986
Vasectomy	417.8	502.8	597.4	701.7
Tubectomy	1039.4	1172.4	1317.4	1457.8
Injectables	36.5	52.2	71.2	93.7
IUD	167.2	195.1	225.1	256.9
Pills	551.6	667.0	795.4	938.6
Condoms	450.3	537.1	632.7	739.2
Vaginal Methods	51.5	53.2	53.5	52.2
Traditional	918.9	1034.9	1150.9	1265.3
Total	3633.2	4219.7	4844.1	5503.4

Table 10: Annual Number of Acceptors by Method, 1984-1986

Method	1984	1985	1986
Vasectomy	111.1	124.4	127.2
Tubectomy	165.3	169.4	150.4
Injectables	33.0	42.1	50.8
IUD	73.4	82.2	87.4
Pills	357.9	417.1	466.5
Condoms	339.0	391.9	437.2
Vaginal Methods	16.0	16.1	15.7
Traditional	854.4	936.1	996.6
Total	1950.1	2179.3	2331.8

Table 11: Percentage of Women Using by Method Required to Reach 40 Percent Prevalence by 1992

Method	1987	1988	1989	1990	1991	1992
Vasectomy	4.15	4.51	4.89	5.28	5.69	6.10
Tubectomy	8.13	8.33	8.52	8.67	8.80	8.91
Injectables	.61	.72	.84	.97	1.10	1.24
IUD	1.48	1.57	1.65	1.74	1.83	1.92
Pills	5.57	6.08	6.61	7.16	7.73	8.32
Condoms	4.33	4.67	5.03	5.40	5.77	6.16
Vaginal Methods	.25	.21	.17	.12	.06	.00
Traditional	7.01	7.13	7.23	7.30	7.34	7.35
Total	31.53	33.23	34.94	36.64	38.33	40.00

Table 12: Annual Number of Users by Method Required to Reach 40 Percent Prevalence by 1992 (Thousands)

Method	1987	1988	1989	1990	1991	1992
Vasectomy	793.6	893.2	1002.1	1120.4	1248.9	1378.6
Tubectomy	1554.0	1648.8	1744.4	1838.9	1932.9	2011.5
Injectables	116.6	142.6	171.9	204.7	241.4	280.2
IUD	282.7	309.8	338.9	369.6	402.3	433.9
Pills	1065.5	1203.5	1354.8	1519.4	1698.8	1880.4
Condoms	827.5	924.7	1030.6	1144.9	1268.5	1392.2
Vaginal Methods	47.7	41.8	34.3	25.1	14.0	.9
Traditional	1339.5	1410.9	1481.1	1548.3	1613.0	1662.5
Total	6027.2	6575.4	7158.1	7771.3	8419.8	9040.3

Table 13: Annual Number of Acceptors by Method Require to Reach 40% Prevalence by 1992 (Thousands)

Method	1987	1988	1989	1990	1991
Vasectomy	128.5	140.6	153.6	167.4	177.5
Tubectomy	129.7	131.0	132.4	133.1	126.7
Injectables	59.4	70.4	82.6	96.2	110.2
IUD	90.9	98.6	106.8	115.5	123.2
Pills	509.0	569.8	636.5	708.5	780.3
Condoms	475.2	527.6	584.6	645.9	707.2
Vaginal Methods	9.8	6.4	2.4	0.0	0.0
Traditional	1027.9	1076.3	1123.8	1168.5	1205.2
Total	2430.4	2620.7	2822.7	3035.1	3230.3

Table 14: Annual Consumption Rates for Commodities, 1986-1992

Method	
Vasectomy	.00
Tubectomy	.00
Injectables	4.00
IUD	1.42
Pills	13.94
Condoms	180.00
Vaginal Methods	.00
Traditional	.00

Table 15: Projected Commodity Requirements Needed to Reach a CPR of 40 Percent by 1992 (Thousands)

Method	1987	1988	1989	1990	1991	1992
Vasectomy	-	-	-	-	-	-
Tubectomy	-	-	-	-	-	-
Injectables	467	570	688	819	966	1121
IUD	401	440	482	525	571	616
Pills	14854	16777	18887	21181	23681	26213
Condoms	148954	166455	185511	206076	228333	250597
Vaginal Methods	-	-	-	-	-	-
Traditional	-	-	-	-	-	-

Table 16: Alternative Population Projections Assuming Different Trends in the Contraceptive Prevalence Rate, 1986-2001, (With RNI = r and Users and Total Population in Thousands)

	Users	CPR	TFR	CBR	CDR	r	Total Population (Mid-Year)
1. CPR Required to Reach Replacement Fertility by 2001							
1986	5504	29.8	5.6	39.4	14.2	2.52	101978
1987	6218	32.5	5.4	38.3	14.1	2.42	104126
1988	6975	35.3	5.2	37.2	14.1	2.31	106274
1989	7780	38.0	5.0	36.1	14.0	2.21	108422
1990	8633	40.7	4.8	35.0	14.0	2.10	110570
1991	9540	43.4	4.5	33.9	13.9	2.00	112718
1992	10438	46.2	4.3	32.9	13.7	1.93	114644
1993	11438	49.0	4.1	32.0	13.4	1.86	116569
1994	12444	51.9	3.9	31.0	13.2	1.78	118495
1995	13538	54.7	3.7	30.1	12.9	1.71	120420
1996	14697	57.6	3.5	29.1	12.7	1.64	122346
1997	15772	60.4	3.3	27.6	12.4	1.52	123637
1998	16899	63.3	3.0	26.1	12.1	1.40	124928
1999	18082	66.1	2.8	24.5	11.8	1.27	126218
2000	19325	69.0	2.6	23.0	11.5	1.15	127509
2001	20613	71.8	2.4	21.5	11.2	1.03	128800
2. Rapid Increase in CPR							
1986	5504	29.8	5.6	39.4	14.2	2.52	101978
1987	6067	31.7	5.4	38.7	14.2	2.45	104328
1988	6662	33.7	5.3	38.0	14.2	2.38	106677
1989	7293	35.6	5.1	37.4	14.2	2.32	109027
1990	7961	37.5	5.0	36.7	14.2	2.25	111376
1991	8668	39.5	4.8	36.0	14.2	2.18	113726
1992	9363	41.4	4.7	35.3	14.0	2.13	116048
1993	10121	43.5	4.5	34.6	13.8	2.08	118370
1994	10923	45.5	4.4	34.0	13.6	2.04	120691
1995	11774	47.6	4.2	33.3	13.4	1.99	123013
1996	12675	49.7	4.0	32.6	13.2	1.94	125334
1997	13501	51.7	3.9	31.6	13.0	1.86	127367
1998	14367	53.8	3.7	30.6	12.7	1.79	129400
1999	15278	55.9	3.6	29.6	12.5	1.71	131432
2000	16234	57.9	3.4	28.6	12.2	1.64	133465
2001	17244	60.0	3.3	27.6	12.0	1.56	135497

Table 16 (Continued)

	Users	CPR	TFR	CBR	CDR	r	Total Population (Mid-Year)
3. Moderate Increase in CPR							
1986	5504	29.8	5.6	39.4	14.2	2.52	101978
1987	5938	31.1	5.5	39.1	14.3	2.49	104533
1988	6397	32.3	5.4	38.9	14.3	2.46	107089
1989	6880	33.6	5.3	38.6	14.4	2.42	109644
1990	7390	34.8	5.2	38.4	14.4	2.39	112200
1991	7928	36.1	5.1	38.1	14.5	2.36	114755
1992	8452	37.4	5.0	37.7	14.3	2.34	117478
1993	9026	38.8	4.8	37.3	14.2	2.31	120200
1994	9634	40.2	4.7	36.9	14.0	2.29	122923
1995	10278	41.6	4.6	36.5	13.9	2.26	125645
1996	10961	43.0	4.5	36.1	13.7	2.24	128368
1997	11576	44.4	4.4	35.5	13.5	2.20	131142
1998	12222	45.8	4.3	35.0	13.3	2.16	133916
1999	12902	47.2	4.2	34.4	13.2	2.13	136689
2000	13618	48.6	4.1	33.9	13.0	2.09	139463
2001	14373	50.0	4.0	33.3	12.8	2.05	142237
4. Slow Increase In CPR							
1986	5504	29.8	5.6	39.4	14.2	2.52	101978
1987	5810	30.4	5.5	39.4	14.3	2.51	104668
1988	6131	31.0	5.5	39.4	14.4	2.50	107358
1989	6467	31.6	5.4	39.4	14.4	2.50	110047
1990	6819	32.2	5.3	39.4	14.5	2.49	112737
1991	7188	32.7	5.2	39.4	14.6	2.48	115427
1992	7540	33.4	5.2	39.4	14.5	2.49	118550
1993	7930	34.1	5.1	39.4	14.4	2.50	121673
1994	8343	34.8	5.1	39.5	14.3	2.52	124795
1995	8781	35.5	5.0	39.5	14.2	2.53	127918
1996	9245	36.2	5.0	39.5	14.1	2.54	131041
1997	9648	37.0	4.9	39.2	14.0	2.52	134462
1998	10073	37.7	4.9	38.9	13.8	2.50	137883
1999	10522	38.5	4.8	38.5	13.7	2.49	141305
2000	10997	39.2	4.8	38.2	13.5	2.47	144726
2001	11499	40.0	4.7	37.9	13.4	2.45	148147

Table 16 (Continued)

	Users	CPR	TFR	CBR	CDR	r	Total Population (Mid-Year)
5. Constant CPR							
1986	5504	29.8	5.6	39.4	14.2	2.52	101978
1987	5679	29.8	5.6	39.8	14.3	2.55	104869
1988	5859	29.8	5.6	40.2	14.5	2.57	107760
1989	6045	29.8	5.6	40.6	14.6	2.60	110652
1990	6237	29.8	5.6	41.0	14.8	2.62	113543
1991	6434	29.8	5.6	41.4	14.9	2.65	116434
1992	6610	29.8	5.5	41.4	14.8	2.68	119958
1993	6813	29.8	5.5	41.7	14.8	2.72	123483
1994	7027	29.8	5.5	42.0	14.7	2.75	127007
1995	7254	29.8	5.5	42.2	14.7	2.79	130532
1996	7496	29.8	5.5	42.8	14.6	2.82	134056
1997	7683	29.8	5.5	42.7	14.5	2.82	138123
1998	7883	29.8	5.5	42.6	14.4	2.82	142190
1999	8097	29.8	5.5	42.4	14.2	2.82	146258
2000	8325	29.8	5.5	42.3	14.1	2.82	150325
2001	8569	29.8	5.4	42.2	14.0	2.82	154392
6. Decline in CPR							
1986	5504	29.8	5.6	39.4	14.2	2.52	101978
1987	5618	29.4	5.6	39.9	14.4	2.56	104936
1988	5732	29.0	5.6	40.5	14.5	2.60	107895
1989	5847	28.5	5.6	41.0	14.7	2.63	110853
1990	5963	28.1	5.7	41.6	14.8	2.67	113812
1991	6079	27.0	5.7	42.1	15.0	2.71	116770
1992	6172	27.3	5.7	42.5	15.0	2.75	120454
1993	6287	27.0	5.7	42.9	14.9	2.80	124137
1994	6408	26.7	5.7	43.3	14.9	2.84	127821
1995	6536	26.4	5.7	43.7	14.8	2.89	131504
1996	6672	26.2	5.7	44.1	14.8	2.93	135188
1997	6758	25.9	5.7	44.2	14.7	2.95	139626
1998	6852	25.7	5.8	44.3	14.6	2.97	144064
1999	6955	25.4	5.8	44.5	14.5	3.00	148501
2000	7067	25.2	5.8	44.6	14.4	3.02	152939
2001	7189	25.0	5.8	44.7	14.3	3.04	157377

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Chapter Nine

SUMMARY AND CONCLUSIONS

Andrew Kantner and M. Ataharul Islam

The Secondary Analysis of the 1985 Contraceptive Prevalence Survey (CPS) presents findings of importance in assessing the nature of demographic change in Bangladesh. Issues addressed in this report include assessment of levels, trends, and socio-economic differentials in fertility and mortality, unmet contraceptive need and reasons for the non-use of family planning services, the duration of contraceptive use, characteristics of breastfeeding, determinants of acceptance and continuation of contraceptive use, and the utilization of the proximate determinants of fertility to assess current and future family planning program performance.

Uncertainties regarding the quality of national fertility and mortality data, and methodological controversies surrounding the use of indirect estimation techniques in the present demographic environment of Bangladesh make the identification of definitive demographic estimates highly problematic. Despite the difficulties associated with estimating precise levels of fertility and mortality, it is possible to reach tentative conclusions regarding demographic levels and trends over the past 10-15 years.

Analysis of demographic data collected by the 1985 CPS indicates that fertility and mortality remain high in Bangladesh despite the substantial increase in the CPR between 1981 and 1985. Results reported in Chapter One show that the 1985/86 TFR could plausibly lie within a range from 5.4 to 6.2. Average mortality rates derived for the period 1982-84 suggest that life expectancy at birth e(o) was 50.0 years, the infant mortality rate (IMR) was 138. and the child mortality rate (CMR) was 26.4 per 1,000 children aged 1-4 years. Mortality levels computed from reports of infant, child, and male adult deaths were consistent, which implies that the United Nations South Asian model life table with e(o)= 50 for both sexes provides a reasonably close approximation of 1982-84 mortality conditions in Bangladesh.

Estimates from the 1981-85 biennial CPS indicate that fertility has probably declined in recent years in Bangladesh. The average number of children ever born reported by women aged 40-49 in the 1985 CPS is slightly more than 7 births, which indicates that period fertility levels likely did exceed 7.0 during certain periods over the past twenty-five years. However, period TFR levels as of 1985/86 appear to be substantially below 7.0, with 5.4 serving as a plausible lower bound estimate. Unfortunately, given the evidence currently available, it is not possible to specify a precise magnitude to the fertility decline that has apparently occurred in Bangladesh.

Comparison of 1981-85 CPS data with survey data collected during the nineteen seventies suggests that mortality levels have fallen somewhat, although this decline must be judged to have been more modest than in the case of fertility. Infant mortality rates derived from the 1974 Bangladesh Retrospective Survey of Fertility and Mortality and the 1976 Bangladesh Fertility Survey ranged between 152-155, while the 1982-84 IMR computed from the 1985 CPS was 138 (1). Between 1979 and 1985/86, there is little evidence of any increase in life expectancy in Bangladesh. However, comparison of CPS data with BRSFM and BFS results suggests that e(o) may have increased by around three years between 1972 and 1984.

The review of fertility and mortality differentials presented in Chapters Two and Three generally found that respondents from higher socio-economic backgrounds had lower fertility and mortality. Sizeable differentials were noted for such measures as place of residence, religion, employment status of the respondent, and electrification of the household and locality. The effect of education on fertility and mortality was particularly pronounced. Respondent's (women) with higher educational attainment had lower fertility and mortality. These differentials were more substantial than in the case of husband's educational level. In addition, both fertility and mortality were much lower among women with some secondary level schooling. In the 1985

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1. It should be noted that the 1984 IMR obtained from q(2) was 144, which suggests that q(3) and q(5) estimates based upon reports of child deaths from women aged 25-29 and 30-34 may be underreported relative to women aged 20-24. Therefore, the 1982-84 IMR of 138 may be slightly underestimated.

CPS, the mean number of children ever-born to women with no schooling was 4.2, to women with primary schooling 4.1, and to women with secondary level education 3.4. Among women aged 25-34, the proportion of children ever-born that had died was 20.3 percent among respondents with no education, 15.3 percent for women with primary education, and only 10.3 percent in the case of women with secondary schooling. Expansion of female secondary education may therefore be be a critical factor in bringing about a reduction in family size norms and desire for additional children.

Findings presented in Chapter Four indicate that the desire for additional children is the most commonly cited reason for not using contraception. In other words, the demand for contraceptive services still appears to be low in Bangladesh. Supply constraints (e.g. the lack of access to family planning supplies and services) are not readily cited by respondents as reasons for not using contraception. This finding should of course not be interpreted to mean that the Bangladesh family planning program has succeeded in removing supply constraints to clients. Rather, it suggests that strong pro-natalist sentiments continue to pervade Bangladesh society, particularly in rural areas.

The potential clearly exists to significantly increase the use of contraception in Bangladesh. The conventional measure of unmet contraceptive need (UCN - the proportion of women aged 15-49 who are not using contraception and say they do not want anymore children) was 30.2 percent in the 1985 CPS. Only 10.6 percent of all reproductive aged women who were not using contraception and did not want additional children intended to adopt a family planning method in the future. Therefore, the majority of women with unmet contraceptive need (19.6 percent) do not intend to use contraception in the future. This finding may be indicative of low demand for family planning services or inadequate awareness of contraceptive options and reliable sources of supply. Clearly, the Bangladesh family planning program will need to pay particular attention (and design appropriate motivational strategies) to encourage UCN women with no intention to contracept to become acceptors.

An effort was made in Chapter Seven to identify factors most crucial in determining the acceptance and discontinuation of contraceptive use in Bangladesh. Findings were based upon an analysis of women interviewed in both the 1983 and 1985 CPS samples. Multivariate techniques (logistic regression and the proportional hazards model) were used to

assess the relative importance of demographic, socio-economic and program measures.

Logistic regression analysis found that women were more likely to begin using contraction if they were older, had more living sons, had more children surviving, did not desire additional children and knew more modern methods of contraception. Factors that appeared to have a clear pattern of association with contraceptive use in bivariate analysis (place of residence, education, religion, employment, land ownership and electrification) were not important determinants of acceptance.

The risk of discontinuing use of contraception over time (as estimated by the proportional hazard model) is higher among women that are unemployed, have fewer children surviving, desire additional children, and know fewer modern methods of contraception. Age, education of the respondent, place of residence, religion, land ownership, total number of living sons, and electrification were not important predictors of discontinuation.

This analysis has several policy implications relating to the use of family planning services in Bangladesh. If women are aware of more contraceptive methods (and by implication are more familiar with the advantages and disadvantages of various methods), there is a significantly greater likelihood that they will accept and continue using contraception. In addition, child survival appears to play a major role in the acceptance and continuation of contraception. Women that report relatively low child survivorship are less likely to accept contraception or continue use. Relatively high child survivorship is positively associated with the acceptance and continued use of contraception. This finding lends support to the proponents of the "child survival hypothesis"; namely, that substantial use of contraception and major reductions in fertility are predicated on the reduction of infant and child mortality.

In order for the Bangladesh family planning program to generate sizeable declines in fertility, both the acceptance and continued use of contraception will need to be increased. According to results presented in Chapter Five, current durations of use for modern methods vary considerably. The rate of drop-out for the oral pill and

condom during the first year of use was 45 and 37 percent respectively. About 80 percent of first segment IUD acceptors are expected to continue using the IUD for twelve months. However, at the end of 36 months, the IUD continuation rate falls to 43 percent, only two points higher than the condom continuation rate. The lowest twelve month continuation rate is observed for oral pill users (34 percent). The strong desire for additional children and evidence of low continuation rates indicate that family planning methods other than sterilization are mostly used for birth spacing in Bangladesh.

Age and the number of living children were observed to be directly related to the continued use of contraception. However, it is somewhat surprising that educational attainment of respondents and husbands does not show any association with continuation rates. Place of residence, electrification, and landownership are clearly associated with duration of use. It is important to note that, with the exception of education, indicators of higher socio-economic status are linked to higher continuation rates. This finding partially supports the view that the family planning program cannot be successfully implemented if socio-economic levels remain low for the vast majority of the population.

Another question arises from these research findings; namely; is there any relationship between socio-economic status and quality of treatment in motivational work and follow-up services in Bangladesh? A positive association was evident from operations research conducted in Nepal. This issue should be seriously considered by policy makers in order to ensure consistently high quality services to all clients regardless of socio-economic status. Although continuation rates are lower, irrespective of method, for women desiring additional children, this magnitude is very small (with the exception of condom). This is also indicative of the fact that the desire and lack of desire for additional children have almost the same impact on a woman's continued use of contraception. Improved motivational work can increase continuation rates for those who do not desire additional children.

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