

Razzaque, Abdur; Islam, M. Mazharul; Alam, Nurul : Contraception among Limiters and Spacers in Matlab, Bangladesh. *Asia-Pacific Population Journal*. March 1998. 13(1). P. 65-78.

Contraception among Limiters and Spacers in Matlab, Bangladesh

Abdur Razzaque, M. Maiharut Islam and Nurul Alam

One of the purposes of family planning programmes in developing countries is to provide for the unmet needs of couples for contraception. In KAP (knowledge, attitude and practice) surveys, a large proportion of women usually state that, even though they want no more children, they are not using contraception. Under such circumstances, it is usually assumed that, if contraceptive methods were to be made easily available to them, many women with unmet needs for contraception would adopt those methods. In reality, however, this does not always happen. Nevertheless, in many East Asian countries, following the introduction of family planning programmes, fertility has reached the replacement level. The fertility transition is under way in some Asian countries, but it has yet to begin in others (Caldwell, 1993). In fact, such variations in fertility, despite the wide-spread availability of contraceptive methods, raises the issue of whether existing family planning services need to be modified.

The family planning programme of Bangladesh is considered to be successful because fertility has been declining consistently despite the country's unfavourable socioeconomic conditions. None the less, the level of fertility is still high owing to a combination of factors including couples' desire for a large family and the existence of unwanted births. The success of a family planning programme depends largely on the reduction of unwanted births, yet a programme cannot reduce family size desires (Razzaque, 1996). Using World Fertility Survey data, Bongaarts (1990) estimated that about 24 per cent of all births in Bangladesh during 1975 were unwanted. In the Matlab study area, Razzaque (1998) reported that, among women who wanted no more children, 34 per cent gave birth in the treatment area during the five-year follow-up period compared with 43 per cent in the comparison area.

In the treatment area of Matlab, a remarkable decline in fertility has been observed since the introduction of the MCH-FP (maternal and child-health/family planning) programme. Fertility has also been declining in the comparison area where the government's family planning programme is being implemented. Despite the

extraordinary decline in fertility in the treatment area, the difference in fertility-levels between the two areas has remained almost unchanged over time; however, the difference in levels of contraceptive use has widened. Such a change in the relationship between fertility and contraception is due mainly to an increase in the proportion of contraceptive use for birth-spacing purposes. Among the users, in 1977, 83 per cent of women in the treatment area were using contraception to limit births compared with 54 per cent doing so in 1990 (Koenig and others, 1987 and 1992). Again, Koenig and others (1992) reported that in the treatment area the effect of education on contraception has diminished over time.

Our study proposes that the effect of various socioeconomic variables associated with contraceptive use might be different for limiters and spacers in the treatment and - comparison areas. The objective of the study is to examine contraceptive use and continuation among limiters and spacers. More specifically, this study examines levels and determinants of contraceptive use, continuation, method mix and reasons for non-use among limiters and spacers; it also investigates whether there is any change in the socioeconomic determinants of contraceptive use over time.

Methods and Materials

The study area

The data for the present study come from Matlab thana (district) where the International Centre for Diarrhoeal Disease Research, Bangladesh, has been maintaining its Demographic Surveillance System (DSS) since 1966. Matlab is about 70 kilometres south-east of Dhaka, the capital of Bangladesh. The area is a low-lying deltaic plain intersected by the tidal river Gumti and its numerous canals (for details, see Ruzicka and Chowdhury, 1978; D'Souza, 1981).

The Matlab study area was divided into treatment and comparison areas. The treatment area was exposed to a contraceptive distribution programme during the period 1975-1977 and has been exposed to the Family Planning and Health Services Programme since October 1977. That Programme was introduced to test the hypothesis that demographic change can be induced and sustained through an intensive service delivery programme, even in the absence of extensive socioeconomic development. In the comparison area, services have been limited to those received through the conventional government service programme (for details, see Bhatia and others, 1980). In both areas, contraceptive use was relatively low in 1975. In the treatment area, however, it increased from 12.6 percent in 1977 to 31.1 percent in 1978 after the

introduction of the Family Planning and Health Services Programme. It remained at this level until 1982. Then, between 1982 and 1990 contraceptive use rose from 31.1 percent to 60.6 percent. In the comparison area, contraceptive use is much lower than in the treatment area, but it has also been increasing: from 4.7 percent in 1977 to 16.5 percent in 1984 and 27.2 percent in 1990.

Since the introduction of the Family Planning and Health Services Programme in 1977, a remarkable decline in fertility has been observed in the treatment area. The total fertility rate (TFR) declined from 6.9 children per woman in 1976 to 5.1 in 1980, 4.1 in 1987 to 3.6 in 1990. The TFR in the comparison area declined from 7.2 in 1976 to 6.7 in 1980 and 5.2 in both 1987 and 1990. The crude death rate (CDR) in the treatment area also declined remarkably from 12.5 per thousand in 1978 to 10.0 per thousand in 1985, falling further to 7.6 per thousand in 1990. Simultaneously, the CDR in the comparison area declined, with some fluctuation from 13.8 per thousand in 1978 to 14.1 per thousand in 1985 and 9.4 per thousand in 1990. The decline in overall mortality has been the result largely of a decrease in infant and child mortality.

The Data

The study utilizes three sets of data from the Matlab study area: the 1984 In-depth Survey, the 1990 KAP Survey and 1994-1987 and 1990-1993 Record Keeping System (RKS) data. The primary objectives of both the In-depth and the KAP surveys were to provide updated information on contraceptive use and maternal and child health service performance in both the treatment and comparison areas (for details, see Koenig and others, 1987 and 1992). The In-depth Survey consisted of random cluster samples of 3,785 women of reproductive age from 37 villages in the treatment area and 2,429 women in 40 villages from the comparison area. However, young women were underrepresented in the In-depth Survey owing to sampling procedures that excluded newly married women (Koenig and others, 1987). The KAP Survey used a multi-stage sampling procedure. Thirty-one villages from the treatment area and 36 villages from the comparison area were randomly selected to include every alternate woman of reproductive age. The total number of respondents interviewed in the KAP Survey was 4,238 in the treatment area and 3,708 in the comparison area. Women who were married and non-pregnant at the time of the survey were included in the analysis.

To examine contraceptive use, In-depth and KAP survey data from both the treatment and comparison areas were used. For contraceptive use, the dependent variable took the value of 1 if a woman was using a modern or traditional method of contraception and 0 if she was not (logistic regression). In the logistic model, an odds ratio below 1.00

means that the independent variable has a negative impact while an odds ratio above 1.00 means that the independent variable has a positive effect. The independent variables here are the woman's age, number of living children, number of living sons, woman's education, religion and year of survey. In the logistic model the woman's age and number of living children were treated as continuous variables, while the number of living sons (fewer than two sons, and two or more sons), religion (Muslim and Hindu), woman's education (no education and some education) and year of survey (1984 and 1990) were grouped into two categories. To examine whether the effects of sex preference, religion and woman's education on contraceptive use have changed over time, interaction between these variables and the year of survey was also tested.

To examine contraceptive, continuation, In-depth, KAP and RKS data from the treatment area were used. The In-depth (cohort-84) and the KAP (cohort-90) survey data were matched with RKS records for the subsequent three-year period in order to ascertain survival status, contraceptive continuation and migration status. To examine continuation, the dependent variable is the interval between the survey date and the date of discontinuation, out-migration or censoring (life table). In the life table analysis, continuation of contraception was compared for two different periods. Because a woman might have started using contraception before the survey was conducted, the calculation of duration from the onset of the survey is an underestimation. All-method duration is considered here; it is different from the first method duration because switching is no longer a terminal event. The all-method continuation rate assesses the cumulative probability of practising any contraceptive method between the initial adoption of the first method and non-use of any method, without an intervening pregnancy.

Results

Levels and trends

Table 1 presents contraceptive use in the treatment and comparison areas for two different years. Overall contraceptive use increased by 23 percentage points (from 39.8 percent to 62.5 percent) between 1984 and 1990 in the treatment area compared with 15 percentage points (from 16.9 percent to 31.8 percent) in the comparison area. The increase in contraceptive use was greater among limiters than spacers. In the treatment area, there was a 27 percentage point increase among limiters and a 23 percentage point increase among spacers compared with an increase of 19 percentage points and 13 percentage points, respectively, in the comparison area. This large increase in contraceptive use among spacers indicates that women are becoming more aware of the

positive benefits of longer birth intervals. Moreover, in a recent study, Razzaque (1994) observed that in both the treatment and comparison areas, most of the respondents reported that longer birth-spacing results in greater health benefits for both mothers and children.

Table 1 : Percentage of contraceptive use among limiters and spacers in treatment and comparison areas of Matlab, Bangladesh, 1984 and 1990.

Year		Treatment area			Comparison area		
		1984	%	47.2	31.7	39.8	23.0
	N	1,771	1,045	2,987	1,190	545	1,837
1990	%	74.6	55.0	62.5	42.4	19.9	31.8
	N	2,003	1,315	3,699	1,699	954	2,913

Currently married, non-pregnant women aged 15-49.

The contraceptive method mix used in the treatment and comparison areas differed significantly (Table 2). This reflects the difference in emphasis of the two programmes.

Table 2 : Percentage of contraceptive use among limiters and spacers by method in treatment and comparison areas of Matlab, Bangladesh, 1984 and 1990

Method	1984						1990					
	Treatment area			Comparison area			Treatment area			Comparison area		
	Limit ers	Space rs	Total	Limit ers	Space rs	Total	Limit ers	Space rs	Total	Limit ers	Space rs	Total
Modern	7.2	7.9	7.4	2.5	17.6	4.2	18.2	27.8	21.3	21.8	58.9	29.6
Pill	13.5	35.5	19.7	10.9	38.2	13.9	5.9	7.0	6.1	2.1	3.1	2.3
IUD	31.8	49.1	36.7	2.5	2.9	2.6	45.9	59.9	50.4	3.2	7.3	4.1
Injectable	2.0	2.4	2.1	2.2	5.9	2.6	1.5	1.1	1.4	1.1	2.6	1.3
Condom	0.2	0.6	0.3	-	-	-	0.3	-	0.2	0.3	0.1	0.4
Foam tabs/jelly	36.1	-	25.9	56.7	-	50.5	21.0	0.4	14.4	44.9	1.6	35.7
Tubectomy	2.0	-	1.5	2.2	-	1.9	0.9	0.1	0.7	1.1	-	0.9

Vasectomy												
Traditional	6.8	4.5	6.3	22.6	35.3	24.0	6.6	3.6	5.6	25.7	25.5	25.6
Rhythm	2.6	2.7	2.7	9.5	23.5	11.0	2.9	2.1	2.6	12.2	15.6	12.9
Azal (withdrawal)	1.7	0.9	1.5	2.2	5.9	2.6	1.4	1.1	1.3	4.3	5.2	4.5
Other	2.5	0.9	2.1	10.9	5.9	10.4	2.3	0.4	1.7	9.2	4.7	8.2
Total	100	100	100	100	100	100	100	100	100	100	100	100
N	836	330	1,166	275	34	309	1,533	724	2,257	720	192	912

See table 1.

In the treatment area, among limiters, tubectomy was the most frequently used method in 1984, followed by injectables and the IUD, while in 1990, injectables appeared to be the most frequently used method, followed by tubectomy and the pill (Table 2). Among spacers, however, injectables comprised the most frequently used method in 1984, followed by the IUD and the pill. In 1990, injectables remained the most frequently used method, followed by the pill and the IUD.

Among limiters in the comparison area, tubectomy was the most frequently used method in 1984, followed by traditional methods and the IUD, while in 1990, tubectomy remained the most frequently used method, followed by traditional methods and the pill (Table 2). Among spacers, the IUD was the most frequently used method in 1984, followed by traditional methods and the pill, whereas in 1990, the pill appeared to be the most frequently used method, followed by traditional methods and injectables.

It is evident from table 2 that the use of injectables and the pill in the treatment area increased substantially over that period among both the limiters and spacers, while the use of tubectomy (among limiters) and the IUD decreased. In the comparison area, use of the pill increased substantially among both the limiters and spacers, while the use of tubectomy (among limiters) and the IUD declined. In the comparison area, about a quarter of the women were using traditional methods compared with only about 5 percent in the treatment area. The lower use of traditional methods in the treatment area than in the comparison area is mainly the result of programmatic efforts which promoted modern methods. In each area, although a modern male contraceptive method has been available since the introduction of the programme, its use remains exceptionally low (about 5 percent in 1984 and about 4 percent in 1990).

The contraceptive prevalence rate has long been considered a good indicator by which to evaluate the success of the family planning programme. Another important indicator is contraceptive continuation. Figure 1 (Figure 1 is missing) depicts the overall contraceptive continuation of cohort-84 and cohort-90 in the treatment area. At 36 months, contraceptive continuation reached 60 percent for cohort-84, but declined to 55 percent for cohort-90. However, when sterilization was excluded continuation rates became similar in the two cohorts. While contraceptive continuation was examined by fertility preference, continuation rates were similar for spacers in these two cohorts but not for limiters (Figure 2) (Figure 2 is missing). When sterilization was excluded, continuation for limiters again became similar. Discontinuation of contraception was due mainly to side-effects, particularly among those who wanted to limit the number of births (Razzaque, 1994; Stewart and others, 1991). A much higher level of discontinuation was expected in the comparison area, since the family planning programme operating there is less intensive.

In both the treatment and comparison areas, contraceptive use increased over the study period but available data from the treatment area show that contraceptive continuation has declined. The decline in continuation was due mainly to a decline in sterilization. However, an improvement in contraceptive continuation is expected as the family planning programme develops further.

Reasons for non-use of contraception

Although an intensive family planning programme has been in operation in the treatment area since 1977, 25 percent of the women who wanted to limit births were not using contraception in 1990. In contrast, 58 percent of the women were not using contraception in the comparison area. Among non-users who wanted to limit births, about 30 percent in each area reported that they were not using contraception because they were experiencing postpartum amenorrhoea. Thirty-six percent of the women in the treatment area and 22 percent of the women in the comparison area reported that they were not using contraception owing to side effects or perceived health risks (Table 3). In the treatment area, more women reported side effects than in the comparison area owing mainly to the higher levels of contraceptive use there. Among other reasons for non-use, about 6 per- cent reported objections from husbands or relatives and 3 per cent reported religion as a reason for non-use.

Table 3 : Reasons for non-use of contraception among limiters and spacers in treatment and comparison areas of Matlab, Bangladesh, 1990

Reasons	Limiters		Spacers	
	Treatment area	Comparison area	Treatment area	Comparison area
Objection of husband/relative	6.4	5.9	4.7	2.4
Against religion	2.3	3.6	0.5	0.1
Harmful to health/side-effects	35.7	22.4	7.8	7.1
Postpartum amenorrhoea/breastfeeding	30.6	29.0	39.8	38.7
Husband staying elsewhere	7.2	4.7	9.0	8.5
Old age	6.8	14.2	0.3	0.0
Want more children	1.7	1.7	33.5	33.1
Others	9.3	18.5	4.4	10.1
N	470	979	591	762

See table 1.

Among non-users who wanted to space births, about 30 percent in each area reported that they were not using contraception because they wanted to become pregnant. Among other reasons for non-use, about 40 percent in each area reported that, because of amenorrhoea, they were not using any method, whereas about 7 percent in each area reported that they were not using contraception owing to side-effects.

Determinants of contraceptive use

Among the limiters in each area contraceptive use increased with an increase in the women's age; however, at higher ages contraceptive use decreased (Table 4, columns 1 and 3). Contraceptive use showed an inverse relationship with the number of living children. In each area and year, for those women who had two or more sons, contraceptive use was significantly higher than for those who had fewer than two sons. In both years, Muslims exhibited lower contraceptive use than Hindus in the treatment area. In the comparison area, although Muslims showed lower overall contraceptive

use, levels of use increased over time more among Muslims than Hindus. In the treatment area, women with some education had higher contraceptive use than those who had no education; contraceptive use increased more over time among women who had no education. In both years in the comparison area, contraceptive use was higher among women with some education than those who had no education. Compared with 1984, contraceptive use increased well over 4.1 times in 1990 in the treatment area and over 1.3 times in the comparison area.

Table 4 : Logistic regression (odds ratio) of contraceptive use for limiters and spacers in treatment and comparison areas of Matlab, Bangladesh

Characteristics	Treatment area		Comparison area	
	Limiters	Spacers	Limiters	Spacers
Constant	-7.54	-4.05	-8.65	-7.16
Age of women (cont)	1.59***	1.24***	1.60***	1.39**
Age * Age (cont)	0.99***	0.99***	0.99***	0.99**
Living children (cont)	0.96	1.19***	0.92***	1.19
Two or more sons (rc = < 2 sons)	1.59***	0.98	1.74***	0.72
Literate (rc = illiterate)	1.35***	1.18**	1.57***	1.82***
Muslim (rc = Hindu)	0.53***	1.20	0.42***	1.00
Year 1990 (rc = 1984)	4.16***	2.89***	1.36	4.70***
Education * Year	--	0.69**	--	--
Religion * Year	--	--	1.93**	--
- 2 log likelihood (df)	4,440.3 (3,766)	3,080.6 (2,354)	3,454.3 (2,881)	1,187.2 (1,493)

See table 1; rc = reference category; **p < .05; ***p < .01.

Among the spacers, contraceptive use increased with an increase in the women s age, but again decreased at higher ages in each area (Table 4, columns 2 and 4). Unlike the limiters, however, contraceptive use among spacers in each area increased with an increase in the number of living children. Contraceptive use did not vary by the gender composition of children or religion in either area and year. Contraceptive use was

higher for women who had some education than those who had no education in each area and year. Compared with 1984, contraceptive use increased about 2.8 times in 1990 in the treatment area and 4.7 times in the comparison area.

Determinants of contraceptive use for limiters and spacers were found to vary. Among the limiters, contraceptive use was negatively related to the number of living children in each area, whereas the opposite pattern held true for the spacers. For the limiters, the number of living sons was related to contraceptive use, but this was not the case for the spacers. Also, religious differences in contraceptive use exist for the limiters, but not for the spacers. Education differentials in contraceptive use exist for both limiters and spacers, but among the limiters in the treatment area, contraceptive use has increased more over time among women with no education than women with some education.

Discussion

This study has several advantages over those conducted earlier. It is both cross-sectional and longitudinal in nature and has examined not only contraceptive use and its continuation but also method mix and reasons for non-use separately for limiters and spacers in two areas with different family planning programmes. The study also has examined determinants of contraceptive use and changes in these determinants over the study period.

As the family planning programme developed, an increasing proportion of women have been using contraception to space births. Such changes in contraceptive use affect the fertility-contraception relationship, because the magnitude of a fertility decline depends largely on whether contraception is used for limiting rather than spacing births. In the Matlab study area, Razzaque (1998) documented that, among the spacers, a similar proportion of women gave birth during the follow-up periods in the treatment and comparison areas, but a higher proportion of women gave birth in the comparison area among the limiters than in the treatment area. Because birth intervals and postpartum amenorrhoea for Bangladeshi women have long been a result of prolonged breastfeeding (Huffman and others, 1980) and because little has changed over time (Salway and others, 1993), contraception for the purpose of spacing births may have a minimal effect on fertility owing to postpartum redundant use (Curtis, 1996).

The effect of increased contraceptive use on fertility decline depends not only on whether contraception is used for limiting the number of births but also on the method mix: some effective methods might lose popularity while others might gain. In fact, changes in method mix are currently taking place in the treatment area and to some

extent in the comparison area, i.e. users are changing from more effective to less effective methods. Such a change in the method mix may affect fertility either through increases in contraceptive failure or discontinuation owing to side-effects or a deterioration in services.

In many countries, family planning programmes, even those in operation for a long period of time, may still be characterized by own contraceptive use. In this regard, Bruce (1990) argues that improvement in the quality of services will result in a larger, more committed clientele of satisfied contraceptive users. In the treatment area of Matlab, contraceptive use was found to be higher than in the comparison area, which is a result of differences in the intensity, coverage and overall quality of their family planning programmes (Koenig and others, 1992). However, "Caldwell and Caldwell (1992) contended that the difference in the use of contraceptives between the two areas is due mainly to the difference in method availability. Over the study period, although contraceptive use improved substantially in both the treatment and comparison areas, available data from the treatment area demonstrated that contraceptive continuation did not improve. This was due to the fact that the programme emphasis is mainly on increasing the use of contraceptives rather than continuing their use. Because about two-thirds of the non-users among the limiters were not using contraception as a result of side-effects or postpartum amenorrhoea, and about two-fifths of the non-users among the spacers were not using contraception as a result of postpartum amenorrhoea, it is proposed that needs-based rather than target-based family planning services be provided to couples in order to improve continuation as well as acceptance of contraception.

Earlier analysis of the 1990 KAP Survey data (combining limiters and spacers) showed that education differentials in contraceptive use had disappeared in the treatment area (Koenig and others, 1992). The present analysis found that the education differential disappeared among the limiters, but remained among the spacers. This result demonstrated that, as far as limiters in the treatment area are concerned, the family planning programme has been able to reach all women irrespective of differences in education. Thus, differential programme inputs for limiters and spacers are, required for a more effective programme. The findings in the comparison area, however, confirmed the earlier result: that an education differential does indeed exist for both limiters and spacers. In this regard, Bhatia (1983) reported that, when contraceptive use was low, all occupational categories accepted contraception equally, but with increases in use, differentials appeared.

A preference for sons over daughters exists in Bangladesh (Ahmed, 1981). Some researchers have found that it influences contraceptive use and fertility (Rahman and

others, 1992; Chowdhury and Bairagi, 1990). Our study, however, found that the effect of son preference on contraceptive use exists for limiters but not for spacers. This implies that when a woman reports that she wants to cease childbearing, it does not mean that she and her husband are completely satisfied with the sex composition of their children.

This study lends support to the recommendation of the 1994 International Conference on Population and Development: needs-based rather than target-based family planning services should be provided to clients. This means that couples should be provided with reproductive health services in order to determine freely and responsibly the number and spacing of their children. The study also suggests that, until reasons for non-use and discontinuation - particularly among the limiters - are adequately addressed, a dramatic decline in fertility cannot be fully achieved. At this level of contraceptive use, doorstep services, with the management of minor side-effects, are unlikely to reduce dramatically the number of unwanted births (Razzaque, 1998). However, couples' motivation and counseling, along with the husband's participation as a contraceptive user, could be a viable alternative for women who experience side-effects or health problems with contraception.

Acknowledgment

ICDDR, B is supported by a large number of countries, United Nations agencies and non-governmental and private organizations that share its concern about health problems in developing countries.

References

1. Ahmed, N. R. (1981). "Family size and sex preferences among women in rural Bangladesh" *Studies in Family Planning* 12(3):100-109.
 2. Bhatia, S. (1983). "Contraceptive users in rural Bangladesh: a time trend analysis" *Studies in Family Planning* 14(1):20-28.
- W.H. Mostey, A.S.G. Faruque and J. Chakraborty (1980). "The Matlab family planning-health services project" *Studies in Family Planning* 11(6):202-212.

3. Bongaarts, J. (1990). "The measurement of wanted fertility". Working papers No. 10, The Population Council, New York.
4. Bruce, J. (1990) "Fundamental elements of the quality of care: a simple framework" *Studies in Family Planning* 21(2):61-91.
5. Caldwell, J. C. (1993). "The Asian fertility revolution: its implications for transition theories", in: Richard Leston and Iqbal Alam (eds.) *The Revolution in Asian Fertility: Dimensions, Causes and Implications* (Oxford: Clarendon Press) pp. 299-316.
- "-----and P. Caldwell (1992). "What does the Matlab fertility experience really show?" *Studies in Family Planning* 23(5):292-310.
6. Chowdhury, M.K and R. Bairagi (1990). "Son preference and fertility in Bangladesh" *Population and Development Review* 16(4):749-757.
7. Curtis, Siant L. (1996). "The impact of postpartum redundant use of contraception on contraceptive failure rates" *Demography* 33(1):24-34.
8. D'Souza, S. (1981) "A population laboratory for studying disease processes and mortality -- the Demographic Surveillance System, Matlab, Comilla, Bangladesh" *Rural Demography* 8(1):29-51.
9. Huffman, S. L., A.K.M.A. Chowdhury, J. Chakraborty and N.K. Simpson (1980). "Breast-feeding in rural Bangladesh" *American Journal of Clinical Nutrition* 33(1):144-154.
10. Koenig, M.A., J.F. Phillips, R.S. Simmons and M.A. Khan (1987). "Trends in family size preferences and contraceptive use in Matlab, Bangladesh" *Studies in Family Planning* 18(3):117-127.
11. Koenig, M.A., U. Rob, M.A. Khan, J. Chakraborty and V. Fauveau (1992). "Contraceptive use in Matlab, Bangladesh in 1990: levels, trends and explanations" *Studies in Family Planning* 23(6):352-364.

12. Rahman, M., J. Akbar, J.F. Phillips and S. Becker (1992). "Contraceptive use in Matlab, Bangladesh: the role of gender preference" *Studies in Family Planning* 23(4):229-242.
13. Razzaque, A. (1994). "Reproductive preferences and subsequent behaviour in a rural area of Bangladesh". Unpublished PhD thesis, Australian National University, Canberra.

-----(1996). "Reproductive preferences in Matlab, Bangladesh: levels, motivation and differentials" *Asia - Pacific Population Journal* 11(1):25-43.

-----(1998). "Desire for children and subsequent birth in Matlab: does husband-wife's agreement matter?" *Journal of Biosocial Science* (in press).
14. Ruzicka, L. T. and A. K. M. Chowdhury (1978). "Demographic Surveillance System - Matlab: vital events, migration and marriages - 1976" Scientific Report No. 13 (Dhaka: Cholera Research Laboratory).
15. Salway, S., N.C. Roy, M.A. Koenig and J. Cleland (1993). "Levels and trends in post-partum amenorrhea, breast-feeding and birth intervals in Matlab, Bangladesh: 1978-1989" *Asia-Pacific Population Journal* 8(2):3-22.
16. Stewart, M.K., A.P. Riley, J. Chakraborty and K. Cartwright (1991). "A study of the relationship between menstrual disturbances and continuation of DMPA in rural Bangladesh". Paper presented at annual meeting of the Population Association of America, Washington, D.C.