Communication and Contraception in Rural Bangladesh

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Abstract

This paper examines the association of communication in explaining the decision of women in rural Bangladesh to use or not to use contraception. Using survey data from villages in Bangladesh, we found that communication is an important influence on the ideational change for a smaller family norm and the practice of contraception. This is evident even when socio-economic and cultural variables are controlled for. We recommend that to foster the use of contraception, communication factors should be given greater emphasis, especially to target husbands in the family planning program and to improve the image of female children.

Introduction

Limitations of the classic demographic transition model to explain fertility transitions in Europe, Latin America, Africa and Asian countries in the context of widely differing social, economic and cultural conditions have shifted the focus of explaining fertility transition to the theory of *ideational change*. Intrinsic to this theory are the diffusion of innovation concepts and the key role of communication. The interpretation given to "ideational change" here is ascribed to ideas concerning the acceptability and feasibility of birth control, rather than ideas about the economics of family size, as the motivating force for fertility decline (McNicoll 1992). Analyzing family planning (FP) program efforts in 35 countries, Ross et al. (1989) showed a close relationship between communication efforts and the percentage of couples using modern contraception. Separate analyses of demographic and health survey data from Ghana (Olaleye and Bankole 1992), Nigeria (Bankole 1994) and Kenya (Westoff and Rodriguez 1993) indicated that, among women with similar socio-economic characteristics, more exposure to FP messages in the mass media is significantly linked to greater contraceptive use. The work of Bongaarts and Watkins (1996), Entwisle et al. (1996) and Montgomery

and Casterline (1993) emphasizes social interaction as the core of the reasons for fertility decline in less-developed countries. Further investigations of how social networks affect contraceptive decisions have been made by Rogers and Kincaid (1981), Montgomery and Chung (1998), Kincaid et al. (1993), Kincaid (2000), Marten (2002) and Gayen and Raeside (2004). It is presumed in this approach that if people are centrally located in a social system, then they will learn earlier about any innovation, for example, contraception, and the attitude of their network members about contraception will be an import influence on their contraceptive practice. If the majority of the network members or the influential members of the network have a positive attitude about FP and use contraception, then it may enhance women's practice of contraception through an ideational change towards a small family norm. Thus, once perceived as a supporting service, communication is recognized as a key factor in the adoption of FP use in recent decades (see for example, Retherford and Palmore 1983; Cleland and Wilson 1987; Lapham and Mauldin 1987; Bulatao et al. 1993; Mauldin and Sinding 1993).

In Bangladesh, since 1975 an all-out communication effort has been undertaken for the diffusion of FP as a concept, and contraception as a technique, as part of a national FP planning program. This effort was led by the Information, Education and Motivation (IEM) unit of the Information, Education and Communication (IEC) program of the Bangladesh Government. According to the Fifth Five Year Plan, 1997–2002, "in transforming societal conservative attitude towards FP in the mid-seventies to the present level of almost universal support for it, IEC programs which cut across the Ministries of Health and Family Welfare, Social Welfare, Women and Children Affairs, Education and Information, have played an important role. It has emerged from the stage of the traditional use of leaflets, pamphlets, bill boards and *jarigans* (traditional stage songs) to the extensive use of electronic media like radio and television as well as news media, film show, mass rallies, holding of seminars and workshops in addition to the field workers' interpersonal communications and group meetings with eligible couples and community leaders at the village level (Planning Commission 1998). In 1978, a group of young, educated, female grassroots workers, called family welfare assistants (FWAs), were recruited from local areas to motivate eligible women to use modern contraception, providing free contraceptive devices for those willing to use them. Each FWA was assigned to a geographical area comprising approximately 4,000 married women (Koenig et al. 1992) with the aim of reaching them all every two months with this doorstep service delivery.

Unfortunately, although some research focused on the impact of different communication factors on contraceptive practice, the nature and the relative scope of influence of diversified communication factors used were not addressed in a comprehensive way.

In this paper, an attempt has been made to understand the effect of communication on the contraceptive decision of women in rural Bangladesh. To investigate this, a proxy for communication (i.e., sources of information) was used to create models, while controlling for various socio-economic, cultural, health and demographic variables.

This paper has three complementary purposes: First, to assess the influence of communication on the contraceptive behaviour of women in rural Bangladesh. Second, to construct a model of the likelihood of adopting contraception that demonstrates the importance of communication processes on FP. For this latter purpose, control will be made for other demographic, health and socio-economic-cultural variables. Third, to show the relative influence of types of communication on contraceptive use.

Background

The total fertility rate (TFR) in Bangladesh declined from 6.3 children per woman in 1975 to 3.3 in the period 1994–1996, and then remained constant in the period 1997–1999 (Planning Commission 1998; National Institute of Population Research and Training et al. 2000). However, according to the BDHS 2004 report (National Institute of Population Research and Training et al. 2004), TFR has again dropped to 3. This decline of 48% over a 25-year period occurred without a substantial improvement in socio-economic status, health conditions and other factors that were

thought to be essential for fertility decline. This decline created interest among researchers and policy-makers, and demographers commented that the third stage of the fertility transition had begun (see, for example, Cleland et al. 1994; Amin et al. 1994; Mitra et al. 1994). The TFR then remained on a plateau of around 3.3 for about a decade, starting in the early 1990s, causing concern among policy-makers. An understanding of the factors that explain why women in Bangladesh adopt or do not adopt contraception may give some insight as to how to overcome this plateau.

According to the classical demographic transition model, as forwarded by Notestein (1953) and Easterlin (1978), a society's fertility decline is a consequence of the rising cost and declining economic value of children that accompanies economic and social changes such as industrialization, urbanization and education. Like much other empirical research (for example, Hirschman 1994; Kirk 1996; Coale and Watkins 1986; Knodel and van de Walle 1979), the socio-economic-cultural reality of Bangladesh challenges the expected relationship between socio-economic variables and fertility decline. Bangladesh is mainly agricultural, with a per capita income of $275; with its industrial sector in a nascent state, infant and maternal mortality rates remain high and the educational level, especially among women, is very low. This socio-economic condition, along with the continuing strong influence of traditional cultural institutions, persistent low status attributed to women, strong son preference and strong religiosity challenges the theories of demographic change. The argument of this paper is that the key element causing greater uptake of contraception is a consequence of an ideational shift to a small family norm, and that communication is strongly associated with this.

Conceptual Framework and Hypotheses

"Interest in smaller families and in family limitation does not necessarily appear suddenly as an unambiguous rational decision of large masses of people," observed Freedman and Freedman (1992: 44–50); rather, "interest in family planning spreads from one socioeconomic group to the next and from cities to the rural areas throughout a country, depending on available communication channels." This suggests the importance of mass media and communication campaigns in promoting the diffusion of new attitudes about reproduction and the acceptance of contraception, and thus in speeding up reduced fertility. According to the diffusion of innovation theory (Rogers 1995), adoption of a new behaviour/technology is a five-step process: knowledge, persuasion, decision, implementation and confirmation. This theory implies that, if there is sufficient knowledge and a positive attitude about the benefits of an innovation, then the individual will decide to adopt it. After adoption, if it is perceived to be advantageous, then the practice of the innovation will continue. Radio and television reach millions of people – even in remote areas – and are powerful influences on opinions, attitudes and behaviour. In less-developed countries communication processes have been found to promote discussion of family planning, increase clinic visits and raise the levels of contraceptive use. In some countries (for example, Bangladesh, Pakistan) the influence of campaigns on radio and television have helped make family planning a household word and a community norm rather than the taboo subject it had been (Mahmood and Ringheim 1997: 122–129, 145). Though family planning use depends on people's private decisions and actions, these decisions involve individuals, couples, families and even peer groups, especially in traditional societies (Rogers 1973). Rogers goes on to generalize that mass media channels are relatively more useful in creating awareness knowledge about an innovation, while interpersonal channels are better able to persuade individuals to form favourable attitudes about an innovation. After exposure to family planning messages in the mass media, people typically discuss family planning with friends or relatives, or they make contact with a provider promoted in the mass media such as a clinic or family planning field workers. The mass media, as well as the influential elite of the society such as opinion leaders (especially in traditional societies), help create awareness about desired family size, fertility control and the availability of the contraceptive devices; interpersonal, small group and peer group communication influence directly the practice of methods. Communication processes (both mass and interpersonal) thus make people aware of contraception, its proper use and where to find services. Communication processes counter

myths, dispel rumours (sometimes they also foster rumours [Katz and Lazarsfeld 1955]) and correct misinformation about contraceptives and family planning. Thus, communication processes play vital roles in developing each of the preconditions put forward by Coale (1973: 53–57) to allow the adoption of contraception. The preconditions are: people are aware that fertility can be controlled, methods of family planning are known and available and the individual perceives the use of methods as advantageous.

Several communication factors have been identified as important in demographic literature on Bangladesh. Notable among these are: FWA visits in the Bangladesh family planning program (see Janowitz et al. 1999; Kamal and Sloggett 1996; Rob and Cerenda 1992), community resources (Saha 1994), female community workers (Rob and Cerenda 1992) and social interaction (Kincaid et al. 1993; Kincaid 2000; Marten 2002; Gayen 2004). Janowitz et al. (1999) suggest that repeated visits of family planning field workers not only provide a convenient source of contraceptive supply, but also catalyze latent demand for methods through repeated dissemination of information. Citing works of Phillips et al. (1993), Phillips et al. (1996) and Hossain and Phillips (1996), Janowitz et al. (1999) argue that demand for contraceptives would effectively collapse without the stimulus provided by repeated exposure to home visits. In the Fifth Five Year Plan (1997–2002), the Bangladesh government also recognized the importance of the IEC (Information, Education, Communication) program in transforming societal conservative attitudes towards family planning in the mid-1970s to the present level of almost universal support. In these studies, it was mainly the role of government/non-government change agents on contraceptive practice that were addressed, while mass media and other interpersonal communication influences were ignored. Work on the *Jiggasha* project (Kincaid et al. 1993; Kincaid 2000) focused on the influence of social networks compared to family welfare assistants (FWAs), and the work of Marten (2002) indicated the effect of social interaction. The *Jiggasha* project results represent the contraceptive behaviour only of the women who were likely to be within the social networks of centrally located women identified by FWAs (Kincaid 2000). In the work of Marten (2002), the 1993–94 BDHS data (National Institute of Population Research and Training et al. 1994) have been used to test mass media influence, while in-depth interviews of 40 women were used separately to test the influence of social interaction. Thus, the simultaneous influences of mass media and interpersonal communication on fertility behaviour in Bangladesh are yet to be investigated. This paper undertakes an analysis of the influence of various communication factors on women's fertility behaviour using statistical modeling while controlling for other socio-economic-cultural determinants. In addition, the relative roles of different forms of communication will be investigated.

Data and Methods

Data were collected by interviewing 724 women from seven villages and a small town (*mahalla)* in Bangladesh using structured questionnaires from July 2002 to January 2003. A currently married woman who had at least one child was interviewed from each household in each of the chosen villages. The reason for choosing women who had already one child was that it was discovered from the pilot survey that women who were married but had no child were reluctant to think about contraception. This is perhaps because in Bangladesh the social cost of not having a child is much higher than that of having more children.

Villages were taken as the sample areas because 80% of Bangladeshi women live in rural areas. One village was selected from each of the six administrative divisions of Bangladesh. These administrative divisions are different geographically, economically, socially and culturally, and the villages were chosen to reflect this diversity. Another village was chosen where the majority of the inhabitants were Hindu in order to make the comparison that would allow determination of the influence of religion. The pilot survey was made in a *mahallah*. The response from the pilot survey correlated positively with the rural villages, and it was decided to include the pilot data in the data set.

The survey instrument was a structured questionnaire completed by an interviewer. The structure of the questionnaire comprised five domains: demographic, socio-economic-cultural, reproductive,

family planning and sociometric questions. Altogether, 77 questions were asked; similar variables were combined using factor analysis with varimax rotation. Other variables, which existed within a class of variables, such as questions pertaining to possessions held, were cumulated to give overall scores.

This research was conducted as part of a PhD thesis by Gayen (2004) and was funded by Napier University, UK. The survey questionnaire was developed by the researcher under the guidance of the supervisory team for this PhD project and was approved by the university research and ethics committee. While preparing the questionnaire, we consulted BDHS questionnaires and developed some questions particularly to fulfill the aims of this research. The questionnaire was pre-tested in a *mahalla* in Bangladesh. After scrutiny and amendments, the questionnaire was finalized. The questionnaire was then translated into Bangla, and the researcher recruited and trained the survey teams in Bangladesh. Teachers and students from the Department of Mass Communication, Rajshahi University in Rajshahi Division, the Department of Journalism, Chittagong University in Chittagong Division, the Department of Anthropology, Shah Jalal University of Science and Technology in Sylhet Division, the Department of Mass Communication and Journalism, Dhaka University, along with local primary school teachers in Dhaka Division, Pirojpur Government College in Barisal Division and local college students and teachers in Khulna Division, took part in the survey in respective areas. NGO workers, cultural activists and agricultural extension officers also took part in the survey in some places. Altogether, 43 people, on average six to seven in each area, took part in data collection, with the direct participation and guidance of the researcher. At least one FWA [ex-FWA] or midwife or health worker of the concerned village was included, which gave an extra opportunity to cross-check the validity of the health and family planning practice information.

Methods of Analysis

Data collected in the survey were first explored using statistical tools to check variables for consistency and detect any oddities. This involved the use of standard statistical methods to describe the data and allow investigation of the variability between study areas. The variables were then analyzed using logistic regression to construct a model of the likelihood that a woman practises family planning. On demonstrating the influence of communication on the adoption of contraception, the relative importance of different types of communication in sustaining the use of contraception is then shown.

Measurement

Two dependent variables were used in this research. The first was the "current use of contraception," which was measured by means of a simple yes (=1) / no (=0) answer. The second was the "main reason for use of contraception" among those who use contraception.

Past use and knowledge of family planning were measured with an open-ended question: "What method(s) have you used?" This question presented 10 methods to choose from (and allowed for multiple options).

Reasons for the decision to use family planning method(s) were measured by four statements: (i) to limit family size, (ii) to delay next birth, (iii) health reasons and (iv) others. This was followed by an open question: "If the reason is 'limit family size,' why do you want to limit your family size?" This specific question was designed to understand the reasons why women in a predominantly traditional religious society – where "to be the mother of a hundred sons" (*shato putrer janani how*) is the highest blessing for a newly wedded bride – want to limit their family size at all. Answers to this open question were then grouped into categories, which were given numerical codes.

Reasons for the decision not to use family planning were derived from answers to nine statements assigned in the question: (i) husband's objection, (ii) parent-in-law's objection, (iii) fear of health injury, (iv) lack of knowledge, (v) want more children, (vi) sterility, (vii) religious cause, (viii) newly wed and (ix) others. These questions were used to assess the level of awareness about family planning and the attitude towards it.

To assess the influence of communication on contraceptive decisions is notoriously difficult

primarily due to problems of determining direction of causality, particularly in a situation where the awareness about family planning as a concept is almost universal (National Institute of Population Research and Training et al. 2000, 2004). So to illustrate the importance of communication on contraception practice, the sources of general information were measured in the model. Radio, television, newspapers, posters, billboards, friends and relatives as women's sources of general information were measured on a zero to three scale recording frequency of contact (never = 0, monthly =1, weekly = 2 and daily = 3).

Eleven FP information sources were mentioned in the question to measure the source of family planning information, and exposure to these sources was recorded through yes/no answers. Sources of family planning information were not, however, used in the model, as it was considered that they could be highly correlated with the dependent variable.

To illustrate the influence of communication on the decision to adopt contraception, women were asked to report on a 0–10 scale the degree to which 16 communication factors influenced this decision. The items asked in the question, "Who or what factors influenced you most in your family planning decision?" were (i) husband, (ii) parents, (iii) in-laws, (iv) relatives, (iv) friends, (v) FP workers, (vi) poster, (vii) opinion leader, (viii) TV advertisement, (ix) Radio FP programs, (x) village theatre, (xi) magazines, (xii) movie, (xiii) pamphlet, (xiv) mobile van, (xv) public lecture and (xvi) others.

Besides these communication variables, some other new variables were created for controlling purposes. *Women's education level* was measured by no = 0, primary = 1, secondary = 2 and greater than secondary = 3; *women's job* was dichotomized as housewife = 0 vs. other than housewife = 1; *place of giving birth* was dichotomized as home = 1 and otherwise = 0; *income source* was dichotomized as agriculture and agriculture-related income = 1 and otherwise = 0; *micro-credit organization affiliation* was coded as yes = 1 and no = 0; *land property* was dichotomized as cultivable land = 1 and no land = 0.

Housing score was created using factor analysis from the variables house type, roof, wall and floor materials. Each of these variables was scored on the degree to which they were composed of modern materials. The created variable accounted for 51.9% of the original variation. This was combined with a count of economic possessions (whether or not they have electricity, furniture, watch/clock, telephone, bicycle, motorcycle and sewing machine) and level of husband's education. These were combined by first computing z-scores of the count of possessions and husband's education and then averaging all three variables to give a measure of socio-economic status (SES). The internal reliability (alpha) of this measure was 0.695.

"Status of traveling unaccompanied" and "degree of decision- making power in household matters" – these two variables were combined using factor analysis to create the new variable *female autonomy score*, which accounted for 79.1% of the original variation. Women were asked who assisted them in their child delivery. From this, three new dummy variables were created: delivery assistant: health professional (qualified doctor, nurse/midwife, family welfare visitors [FWV]), delivery assistant: friends and relatives (parents, in-laws, brothers and sisters) and delivery assistants: unqualified professionals (trained traditional birth attendants [TTBA], untrained TTBA, unqualified doctors and *dai*).

All variables were used in a stepwise binary logistic regression analysis, and measures of concordance and discordance were used to assess the explanatory power of the model.

Results

Characteristics of the Women in the Survey

The mean age and standard deviation of the interviewed women was 28.2 and 6.6 years, respectively. Their husbands were on average 8.5 years older than they were with a standard deviation of the age difference of 5.1 years, and the average age at which women got married was 15.5 years (standard deviation 2.9 years). The average age of a woman at the birth of her first child was 17.8 years (i.e., teenage pregnancy) with a standard deviation of 2.95 years, almost the same as the national average

of 17.44 years (National Institute of Population Research and Training et al. 2000). The dominant religion of the interviewed women was Islam, 75.5%, and the rest were Hindu, 24.5%; this was higher than the national count of 12% (as a result of the deliberate inclusion of a Hindu village). The mean number of children was 2.64 (standard deviation 1.5), and there was a demand for on average 1.27 further male children, which was 2.54 times more than that of the demand for further female children. Of the women interviewed, 92.7% were housewives and 48.9% could neither read nor write, similar to the national average of 46% (National Institute of Population Research and Training et al. 2000). On average, 64% of women had no freedom to travel unaccompanied and only 32.2% could make decisions on household matters. Only 9.7% of the interviewed women reported that their husbands had any cultivable land, and around 40% of women had affiliation with a micro-credit organization. Displayed in Table 1 are some basic characteristics of the interviewed women.

Table 1. Characteristics of women interviewed in the survey areas

Study area	% FP use	Mean wife's age	Mean age at first child born	Mean number of children	Mean demand for more male children	Mean demand for more female children	Mean level of women's education	Mean housing score	Mean female autonomy score	Socio-economic score	% child death
BN	66.67	25.94	17.94	2.22	0.24	0.17	0.84	-0.78	0.49	-0.29	11.11
BS	66.23	25.84	18.03	2.53	0.51	0.28	0.93	0.13	-0.75	0.18	35.14
JB	36.08	28.62	17.63	3.65	0.49	0.14	0.59	-0.31	-0.43	-0.32	32.99
KP	61.90	28.63	17.59	2.70	0.36	0.14	0.48	-0.25	-0.54	-0.46	29.76
PG	85.28	28.86	17.23	2.59	0.18	0.05	0.89	0.42	0.35	0.23	12.69
RK	68.37	28.66	18.30	2.53	0.39	0.10	1.29	0.14	-0.25	0.20	17.35
MG	72.84	28.06	18.58	2.20	0.30	0.15	0.59	-0.37	0.79	-0.08	2.47
AP	100.0	30.00	18.07	2.33	0.30	0.17	1.07	0.90	0.01	0.58	23.33
Total	69.34	28.17	17.80	2.64	0.33	0.13	0.83	0.00	0.00	0.00	19.48

Ideation about Family Planning: Knowledge, Attitude, Practice

On average, 69.3% of the interviewed women practised at least one family planning method. The reason for practising family planning was mainly to limit family size. Among the women who were practising family planning, 76.67% reported that the reason was to limit family size. Twenty per cent stated that the reason was to delay next birth (their ultimate goal is to limit family size), 2.7% gave health reasons and 0.85% stated other reasons. The reason for limiting family size appeared to be mainly economic. To the open question, "why do you want to limit family size?," 72.89% gave direct economic reasons, 25.13% to avoid probable hazards of raising many children (such as the fear of not providing them with proper food and education), which is also related to economic causes, and only 1.97% gave reasons such as health, philosophical and social commitment. The use of contraception, and thus limiting family size, was reported by the interviewed women as the way to overcome the misery of their present poor economic condition. This is opposite to the popular notion of declining fertility as the outcome of economic advancement, urbanization and moderniza-

tion. Thus, the attitude towards family planning and contraception was positive, and limiting family size was perceived mainly as the way to overcome economic hardship.

Knowledge of family planning was found to be almost universal irrespective of socio-economic-cultural conditions. Though most of the interviewed women could not name family planning devices properly, they could describe what type of devices they used. Overall, they mentioned about four types of device: *bori* (any type of pill, more specifically *maya bori*), *Su(n)i* (injections), *khatam* or *jhamela shesh* (any type of permanent method) and *baichchhya ghuichhya choli* (menstrual regulation, rhythm and calendar). The most popular method was pill, with 66% of the respondents using this method. The second most used method was injectables, mentioned by 17% of the respondents. Next was a mix of pill and injectable (method mix), cited by 5.3% of the women. Female sterilization was the method used by 5.17% of women. Only 3.2% of husbands used a contraceptive method. Condom was the most popular male contraceptive method, but only 2.6% of all husbands used this method. In the *mahallah*, the rate of condom use was highest (10%), and the lowest (0%) was in the Hindu majority village. Male sterilization was cited by only 0.71%.

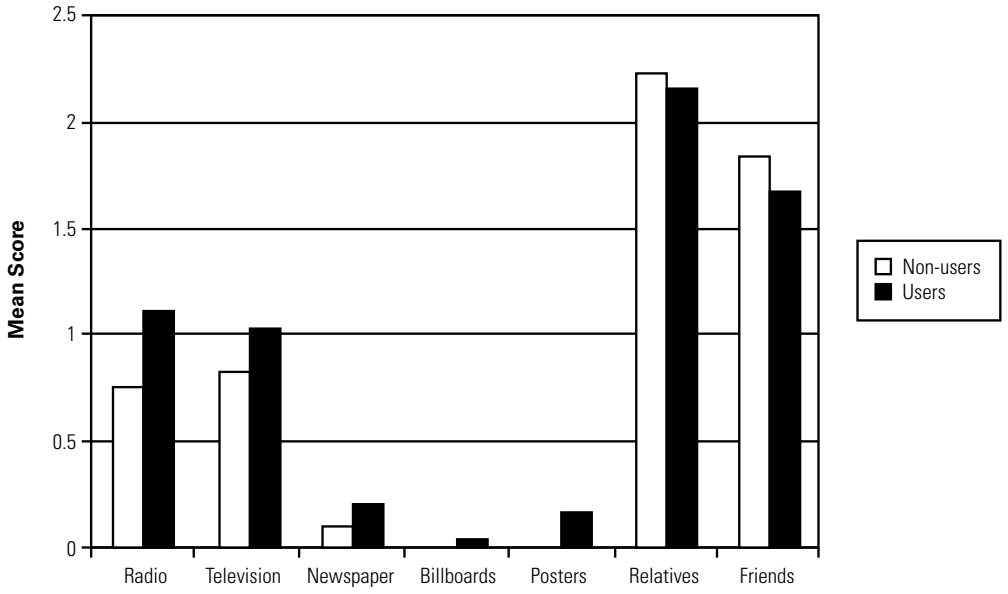
The desire for more children is the main reason for not practising family planning. On average, 10.2% of women wanted more children and hence they did not use any family planning method. Among the women who did not practise any family planning method, 34% wanted more children. The other causes were: health reasons (23%), husband's objection (9.3%), lack of knowledge (8.7%) and religious reasons (5.7%). A further 19.3% gave other reasons; the main one was that their husbands lived overseas (especially in Jobra, where this reason was cited by 52% of women).

We hypothesize that communication played a vital role in this ideation formation about family planning, both as a norm and as a technique. To test this argument, the role of communication was measured in terms of influencing factors for contraception decisions, and information sources for diffusion of family planning.

Sources of General Information and the Practice of Family Planning

Scores of the sources of general information were compared for contraceptive users and non-users; this comparison is portrayed in Figure 1. From this, it is clear that relatives and friends were the most

Figure 1. Sources of general information and use of contraception



important sources of general information (i.e., informal communication; in Bangla, this is known as *mainser mukhe mukhe*, meaning "through other people's mouths"). Relatives, friends, radio and television scored high compared to printed matter, which is hardly surprising for a country with relatively low literacy rates. However, radio and television scored higher among contraceptive users than non-contraceptive users. The scores for relatives and friends were not significantly different between the two groups. This may suggest some polarization in this society in that non-users are discouraged from using contraception by their relatives and friends, while those practising contraception may well be supported by a group of like-minded contacts. When the totals of these information sources are examined in the information score, there is found to be a significant difference at the 5% level (P-value = 0.013) between the mean of contraceptive users (6.40) and the mean of contraceptive non-users (5.79).

Model of the Likelihood of Using Family Planning

Given the socio-economic and cultural situation of the interviewed women and their ideation about family planning discussed above, the impact of explanatory demographic, health, socio-economic-cultural and communication variables on FP use was modeled using binary logistic regression analysis. In total, 25 variables were used, of which eight were demographic variables, four were health variables, nine were socio-economic-cultural variables and the remaining four were communication variables. The four communication variables were formed from subgroups of the general sources of information; these, along with the other variables used in the models, are presented in Table 2.

Table 2. Variables used in the model

Demographic Variables	Total number of children, wife's age, wife's age at birth of first child, number of family members, demand for male child, demand for female child, sex of first child born (1 = male, 0 = female), death of male child
Health Variables	Delivery assistance: professional (no = 0, yes = 1), delivery assistance: relatives (no = 0, yes = 1), delivery assistance: unqualified (no = 0, yes = 1), place of giving birth (home = 1, 0 = otherwise)
Socio-economic-cultural Variables	Women's education level was measured by no = 0, primary = 1, secondary = 2 and greater than secondary = 3, income source (agriculture = 1, 0 = otherwise), wife's job (housewife = 0, 1 = otherwise), female autonomy score, religion (Hindu = 1, Muslim = 0), micro-credit organization affiliation (yes = 1, no = 0), land property ownership (yes = 1, no = 0), food consumption, socio-economic status (SES)
Communication Variables	Radio as a source of general information. Television as a source of general information. Display = average of newspaper, billboards and poster as a source of general information. Relatives and friends = average of relatives and friends as a source of general information.

Bi-variate logistic regression models were run with each of the variables in turn to obtain unadjusted odds-ratios to show the effect of each variable on the likelihood of using family planning. These are displayed in Table 3.

Two of the communication variables, radio and display materials, are significant and have a positive influence on the likelihood of using contraception. Among the demographic variables, only demand for more children and experience of male child death are significant, and these have a negative association with the likelihood of contraceptive use. For the health variables, only when the delivery assistant was a relative was there a significant association with the likelihood of contraceptive use, and this was a negative association. Of the socio-economic-cultural variables, four variables (level of woman's education, socio-economic status, female autonomy scores and micro-credit organization

affiliation) have significant positive associations with the likelihood of using contraception.

These variables were then entered into a multivariate model using Wald's forward selection method. The model was developed sequentially first, in model I, using demographic variables only; the health variables were then added to produce model II. Model III was formed by adding the socio-economic-cultural variables to model II. Finally, the communication variables were added to model III to produce model IV. These models are displayed in Table 4. In this table, only variables that were significant at the 5% level are displayed.

Table 3. Unadjusted coefficients and odds ratios for each variable of the likelihood of FP use

Variable	Coefficients	Odds Ratio
Demographic		
Total Number of Children	-0.038	0.962
Wife's Age	0.735	1.003
Age at First Birth	-0.022	0.980
Number of Family Members	0.022	1.022
Demand for Male Children	-0.461	**0.630**
Demand for Female Children	-0.209	**0.559**
Sex of First Child	0.175	1.190
Death of Male Child	-0.677	**0.508**
Health Variables		
Delivery Assistant Professional	-0.07	0.928
Delivery Assistant Relative	-0.927	**0.396**
Delivery Assistant Unqualified	-0.305	0.737
Place of Giving Birth	0.253	1.288
Socio-Economic-Cultural		
Income Source	-0.240	0.787
Woman's Level of Education	0.235	**1.265**
Wife's Job	-0.071	0.932
Socio-Economic Status	0.422	**1.525**
Female Autonomy Score	0.281	**1.325**
Religion	-0.085	0.919
Micro-Credit Organization Affiliation	0.655	**1.925**
Land Property Ownership		
Food Consumption	-0.005	0.995
	0.078	1.081
Communication Variables		
Radio	0.197	**1.218**
Television	0.114	1.121
Display	0.445	**1.156**
Relatives and Friends	-0.049	0.957

Figures in bold in the odds ratio column are statistically significant at the 5% level

The explanatory power of the model increased when the different subgroups of variables were added. Health variables connected with assistance at delivery appeared in model II but dropped out when socio-economic-cultural variables were added.

From model I in Table 4, "demand for more children" and "death of male child" were the only demographic variables that were significant, and both were negatively associated with FP use. Among the socio-economic-cultural variables from model III, female autonomy score, socio-economic status (SES) and micro-credit affiliation were significant, and all were positively associated. When communication variables were added (model IV), exposure to radio and display materials as a general source of information appeared significant. Overall, the model correctly classified 72.2% of the cases (20.5% of non-users and 95.7% of users were correctly classified). "Women's affiliation

with micro-credit organization" and "women's autonomy score" (of which a major component is to "travel unaccompanied") were both positively associated with the likelihood of contraception use. It is argued that as these variables enable women to meet and exchange information outside the home, they can be considered facilitators of communication (see Steele et al. 1998; Mason 1986).

It was evident in the models that the higher the exposure to communication, the greater the likelihood of using contraception. This raised the question, what role did communication play in this decision? In this research, this question was examined in two ways: (i) communication as a diffuser of family planning information and (ii) communication as a perceived influence by the women who are using contraception.

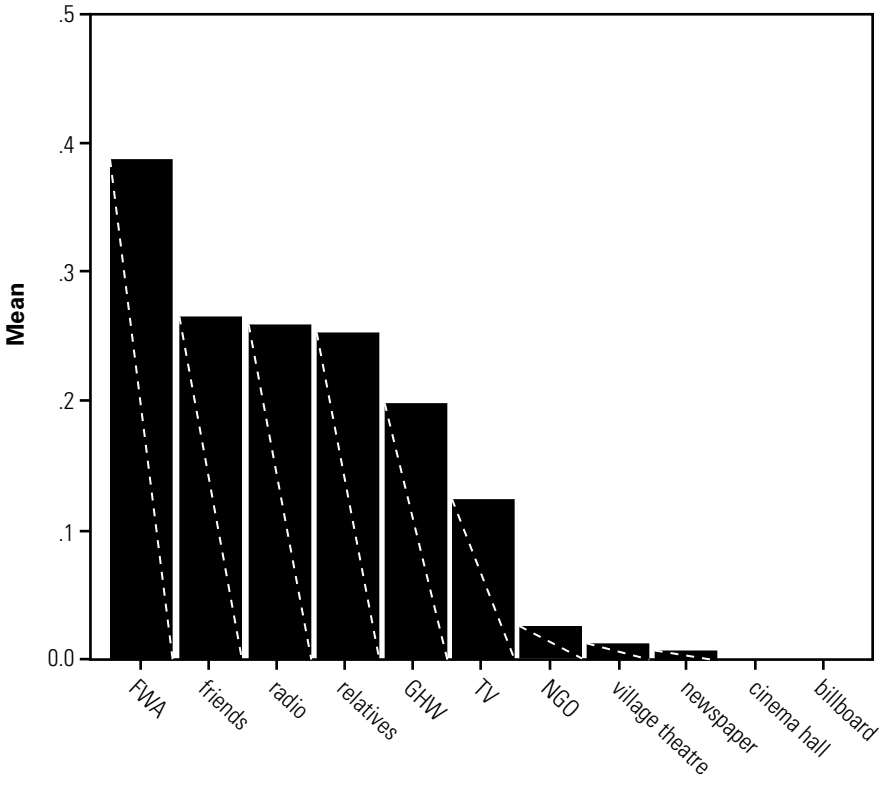
Table 4. Adjusted coefficients and odds ratios for each model of the likelihood of FP use

N = 723	Model I demographic variables		Model II demographic and health variables		Model III demographic, health and socio-economic-cultural variables		Model IV all variables	
Variable	**Coefficients**	**Odds Ratio**	**Coefficients**	**Odds Ratio**	**Coefficients**	**Odds Ratio**	**Coefficients**	**Odds Ratio**
Demographic Variables								
Demand for Male Children	-0.391	0.677	-0.358	0.669	-0.276	0.759	-0.314	0.730
Demand for Female Children	-0.494	0.610	-0.523	0.592	-0.509	0.601	-0.570	0.565
Death of Male Child	-0.686	0.503	-0.590	0.554	-0.650	0.522	-0.640	0.527
Health Variables								
Delivery Assistance Relatives			-0.712	0.491				
Delivery Assistance Unqualified			-0.365	0.694				
Socio-Economic-Cultural Variables								
SES					0.434	1.543	0.261	1.299
Micro-Credit Organization Affiliation					0.627	1.873	0.581	1.788
Female Autonomy Score					0.157	1.170	0.158	1.172
Communication Variables								
Radio							0.132	1.141
Display							0.964	2.622
Constant	1.124	3.076	1.389	0.162	0.866	2.378	0.711	2.035
Pseudo R Square Cox & Snell Nagelkerke	 0.038 0.05		 0.048 0.068		 0.080 0.113		 0.092 0.130	
Total % correct % of Users Correct % of Non-Users Correct	69.6% 97.4% 6.8%		70.8% 76.6% 12.2%		72.0% 95.5% 19.2%		72.2% 95.7% 20.5%	

Diffusion of Family Planning and the Perceived Influence of Communication

To assess the role of different types of communication in the diffusion of family planning, sources of family planning information were recorded for the women who practised contraception. FWA, friends, radio, relatives, government health workers (GHW), TV and NGO were found to be important sources of FP information, whereas exposure to village theatre, newspaper, billboard and cinema were negligible. In Figure 2, the FP information sources cited by the respondents are displayed.

Figure 2. FP information sources



Clearly, the most important source of family planning information is FWA, followed by friends, radio and then relatives. Among mass media, radio was the most important source of family planning information, and then television. Newspapers and magazines do not have much influence, which is perhaps due to the low literacy rate. Only 0.01% mentioned newspapers, and 0.01% mentioned village theatre. As well as being a family planning information source, FWAs were also found to be the most important source of family planning device collection (57.62%). This service delivery (both FP information and device) might have a huge influence on village women who are not allowed to travel unaccompanied outside the home: supply itself creates its own demand (Easterlin and Crimmins 1985).

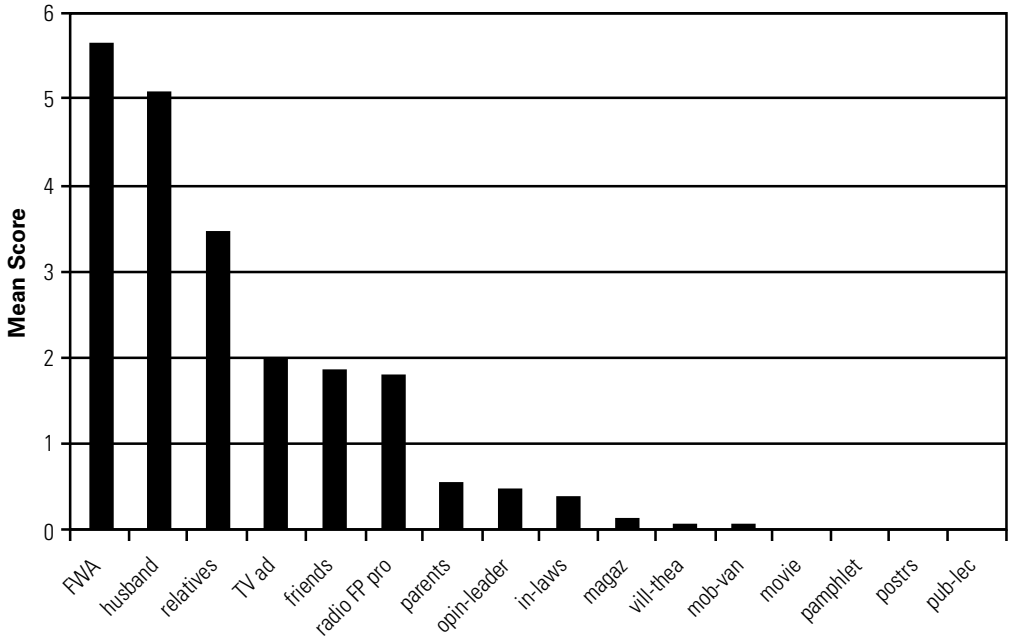
The perceived influence of different forms of communication was also measured for those who practised contraception. From the Pareto chart of influences on the decision to use contraception, displayed in Figure 3, it is clear that interpersonal factors, such as husband, FWA, relatives and friends, are the most important. These are followed by mass media and then displayed messages.

To assess the effect of these variables in promoting the sustainability of contraceptive use while controlling for demographic and socio-economic and cultural variables, a further logistic regres-

sion was developed. In order to prevent post-justification bias while constructing the model, only contraceptive users were included. The dependent variable was whether the main reason to use contraception was "to limit family size" (=1) or "to delay next birth" (=0). As other reasons only accounted for less than 5% of the stated reasons, those were treated as missing values. The model is displayed in Table 5.

Two communication variables appear as significant. These are husband's influence, which leads to the decision to "delay next birth" rather than to "limit family size," whereas the influence of FWAs has the reverse effect. Demand for more children and women who work outside the home make the decision to use contraception "to delay next birth" more likely. The older the mother and the greater the female autonomy score, the more likely the reason is to "limit family size." Thus, interpersonal communication via husbands and FWAs is important in sustaining family planning.

Figure 3. Mean stated influence on decision to use contraception (contraceptive users only)



Discussion

From the descriptive statistics, it was clear that the main reasons for practising family planning among the interviewed women was "to limit family size," in 76.67% of the cases, and to "delay the next birth" in 20% of cases. Thus, it is argued that women who were practising family planning had an ideational shift for a small family norm. It was found that the general communication sources that were most associated with FP decision-making were mass media (see Figure 1). However, of those who adopted contraception, FWA and husband were stated to be the two most important factors influencing contraceptive use. From the logistic regression model IV, in Table 4, radio and display material were found to influence the greater uptake of contraception. Relatives and friends did not appear as significant in the regression and this, we postulate, is a reflection of a polarized society in which there are promoters and rejecters of contraception. Socio-economic status (SES), female autonomy score and micro-credit affiliation were found to have a significant positive effect on the likelihood of using contraception. Increases in both female autonomy and micro-credit organization affiliation enable the exchange of

ideas among women and increase their exposure to interpersonal communication.

As the models develop, their explanatory power increases but remains low, and we postulate that the proportion that remains unexplained is the effect of communication influences. This is hinted at by the results displayed in Figure 3, which shows the importance of interpersonal communication.

Among the demographic variables, only "demand for more children" and "death of male child" appeared significant in model IV, and, as expected, the higher the demand, the less likely the practice of contraception. These demographic variables indicate the strong son preference.

In regard to the diffusion of family planning practice, it was found from descriptive statistics that the main source of general information was interpersonal (i.e., husbands, FWA, friends and relatives [see Figure 1]). The source of family planning information was also mainly interpersonal: family planning field workers and health workers, friends, relatives. These were found to be much more important sources of family planning information than mass media (see Figure 2). However, in order to avoid the problem of the direction of causality, communication sources that influenced the decision to use FP and FP information sources were not used in the logistic regression model of the decision to use family planning; the findings from this study show the importance of interpersonal communication in sustaining the use of contraception. This was borne out by the findings of the logistic regression that was used to model the reason for adopting family planning: here, husbands exerted influence "to delay next birth" rather than "to limit family size," whereas FWAs promoted the limiting of family size.

Table 5. Logistic regression model of reasons for limiting family size

Variable	Coefficients	Odds Ratio
Wife's age	0.128	1.137
Demand for female children	-1.793	0.082
Demand for male children	-2.501	0.166
Wife in work	-1.171	0.310
Female autonomy score	0.338	1.402
Land property	0.658	1.930
Husband's influence	-0.126	0.932
FWA influence	0.135	1.135
Constant	-1.404	0.246
Pseudo R square Cox & Snell Nagelkerke	 0.328 0.516	
Total % correct % of users correct % of non-users correct	86.2% 94.2% 54.8%	

Conclusion and Policy Recommendation

The factors that influence family planning use in rural Bangladesh were assessed in this paper. Ideational change for a small family norm to avoid economic hardship was found to be at the core of family planning use. This was irrespective of socio-economic and cultural conditions. In this ideational change, it is argued that various communication factors played a central role.

The logistic models left much unexplained, which we suggest may be explained by interpersonal influences on women. Although only sources of general information were examined in the model, and of these radio exposure and exposure to display materials appear as relevant, female autonomy score and micro-credit affiliation are strong predictors of contraceptive uptake. Thus, the ideological shift to the acceptance of lower family sizes is observable through these variables.

Though FWAs were found to be of high importance, since 1999, the doorstep service delivery has been withdrawn from the national FP program. This may have been one of the contributing factors to the continuation of the plateau of TFR at 3.3 for a decade (this has dropped to 3 recently, (National Institute of Population Research and Training et al. 2004). Although husbands rarely used contraception themselves (only 3.2%), Gayen (2004) found husbands to be very important factors in deciding family planning use (58%), the methods used (58.4%) and delivery place and assistance (63.8%). It is recommended in this paper that the FWA service delivery be re-established (also see Andaleeb 2004). Son preference still prevails as a negative influence on FP use, so it is recommended that communication channels be used to portray positive images of female children. Husbands should also be targeted in order to reduce their objection to the use of contraception, as this was cited as a significant reason by those who did not practise family planning. The importance of continuing education and communicating information is also highlighted, as "lack of knowledge" was cited as the third most important reason for not practising family planning.

In this research, interpersonal communication factors (FWA and husband) were found to be the most influential on the FP decision-making and, similarly, interpersonal communication channels were found to be the most important sources of general information and family planning information.

To ensure a greater adoption of family planning, it is recommended that various communication channels be used, especially interpersonal, to build awareness for those who are still having a "lack of knowledge about FP," and to target husbands and improve the images of female children to accelerate the ideation about family planning and to use contraception. It is anticipated that these channels can also be used to promote maternal and child health related issues in rural Bangladesh in the absence of developed socio-economic infrastructure.

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