Factors and processes shaping contraceptive choice in high prevalence traditional method state of West Bengal, India: A Multilevel Analysis

Abstract:

This paper examines determinants of contraceptive choice in the state of West Bengal, India, which has the highest prevalence of traditional methods combined with high female sterilization. The principal research questions are whether contraceptive goals or contraceptive competence or access or programme play a larger role in choice. The study is based on the Demographic Health Survey-3 data for West Bengal, complemented with the researcher's investigation using a qualitative approach that included focus group discussions (FGDs) with women in reproductive ages and interviews with service providers. Urban place of residence and standard of living significantly affect the choice of traditional methods. In urban areas withdrawal preference is due to husbands' education, and tendency to take decisions and the problem of side-effects. In rural areas, Inter Uterine Device (**IUD) is not chosen because of the recurrent cost though there is a provider bias. The qualitative findings suggest that the programs need to consider provider bias and social networks since they can influence individuals and communities as inferred from quantitative findings that both level matters.**

Introduction

Contraceptive technology has its roots in the history of the American and European women's struggle for reproductive freedom where the movement of birth control originated. This can raise the question in our minds as to how contraceptive technology could bring reproductive freedom for women. Margaret Sanger was a pioneer who put forward the point that women's freedom could be made functional only by her rights to own and control her body. Controlling one's body meant using contraceptives and also the right to abortion. However, from studies done by Outshoorn in 1992 show that "women's right to choose" was not the slogan of the women's movement everywhere (Gupta, 2000: 66). 'Birth control' and 'population control' have different connotations though often the terms are used interchangeably in reproductive health literature. The fundamental difference between 'birth control' and 'population control' is intrinsic to this study. "Population control is done by an outsider, the national government, international agencies or Church, whereas birth control is the right of women and men to make decisions about their reproductive capacities" (Gupta, 2000: 144). Eventually 'birth control' and 'population control' were amalgamated. Population control through population policies was made popular by the West when the perception of overpopulation in the third world countries was thought to be the main reason for their underdevelopment. This marked the beginning

of family planning intervention programs in the third world by making birth control accessible to all.

India in the 1920s saw the idea of contraception to control births on the lines of Neo-Malthusians. Since then there have been debates for and against population control by philosophers, administrators, social thinkers, leaders and specifically by the Indian National Congress with the establishment of the National Planning Committee in 1935. The Family Planning Association of India (FPAI) established in 1949, introduced a family Planning Program for India in collaboration with the Family Planning Association of Britain, which later came to be known as the International Planned Parenthood Federation (IPPF). The FPAI was instrumental in the development of the Family Planning Program for India. " Instead of 'birth control' the term 'family planning', first introduced at the First International Population conference in London in 1948, was adopted" (Gupta, 2000:206). India's Family Planning Program (after 1975 known as "Family Welfare" Program) was introduced during the first Five-year Plan (1951-56) under the leadership of Jawaharlal Nehru, the first Prime Minister of India with the rationale of "reducing the birth rate to the extent necessary to stabilize the population at a level consistent with the requirement of the national economy" (GOI 1994: 9). Since its inception the Family Planning Program has gone through various phases and has adopted various approaches because of both internal socio-political reasons and external stimuli. India's national program has had a history of emphasizing particular methods. Earlier it emphasized rhythm, condom and vasectomy, followed by IUDs in the 1960s, then vasectomy and 'until recently the program's emphasis remained skewed towards promoting non reversible methods, particularly female sterilization' (Santhya, 2004, p. 26). Injectables like Depo-Provera also received approval and were launched in 1994 in India, which was made possible by the then existing liberal policies favouring deregulation, free trade and foreign investment. Now though injectables are not in the domain of the government's Family Planning Program NGOs (non governmental organizations) and private medical practitioners are still advertising and prescribing them. Another notable phase of reorientation in the history of India's Family Planning Program was associated with the Cairo Conference (1994) where the concept of choice and reproductive health and gender equity was mainstreamed into the program. The targeted approach was replaced by informed choice after 1997 in the population policy papers in India, which reflected the approaches of the Cairo Conference.

Studying contraceptive choice in the Indian context generally means focusing on female sterilization, which is the main method available and used. However, West Bengal, a state in the eastern part of India, shows very unique contraceptive behaviour. Contraceptive prevalence in West Bengal is higher than in all other Indian states except Himachal Pradesh. Thirty percent of family planning users (i.e. 21% of currently married women) use traditional methods. The rhythm method alone accounts for 17 percent of all family planning use, which is higher than the modern spacing method i.e. pills (12 %) followed by withdrawal (8 %). Thus it is the state with the highest traditional method use, 21.3 percent (NFHS-III, 2005-2006) combined with high female sterilization (32.2 %). Conspicuously

traditional methods use is higher in urban areas (25.6 %) than in rural areas (19.6 %, NFHS-III, 2005-2006).

West Bengal has a colonial history which gives it the impetus for fertility transition. The decline in fertility slowly started in West Bengal prior to Independence. Bengal started experiencing fertility transition from the 1960s mostly among the elite. Fertility transition in West Bengal can not be attributed to the Family Planning Program as "West Bengal has never had the kind of aggressive or even efficient family planning campaign or program that many other parts of the country have embraced at various times" (Basu and Amin 2000: 763). Consequently the contraceptive use scenario is not dominated by sterilization like most other states in India, but includes considerable use of traditional methods. The Operation Research Group's (ORG) three surveys included traditional methods to compute contraceptive prevalence, which shows a higher percentage than the national average (ORG, 1972, 1983, 1990). Thus it was seen that West Bengal had a distinct contraceptive practice compared to other states, which contributed to its fertility transition.

The other characteristic of fertility transition in West Bengal has been the wide rural – urban gap in fertility transition. In West Bengal, urban couples are nearing below replacement level fertility. Thus it can be concluded that traditional methods had an important role to play in West Bengal's fertility decline, which has seen a sharp decline in the last two decades.

In West Bengal the overall contraceptive prevalence has increased since NFHS-1 (1992-93). Female sterilization has remained stagnant since NFHS-2 (1998-99) in West Bengal. The use of IUDs, an effective female spacing method has declined since NFHS-2 (1998-99) in West Bengal, but the use of traditional methods shows an upward trend.

Did this gain in traditional method use come at the expense of modern methods or is the relationship between prevalence rates of each type completely independent? Hence, it is important to study the contraceptive choice scenario in West Bengal and also the Family Planning Program's role in choice.

Objectives: The broad objective of the proposed study is to identify individual and community factors affecting the process of contraceptive choice.

Specifically the study plans to address the following objectives.

a. To identify the difference in factors in contraceptive choice between rural and urban areas.

b. To examine whether the government's Family Planning Program has influenced choice.

c. To see if the social network plays a role in choice.

Hypothesis: The following hypotheses are being tested in the study.

a. Individual socio-economic factors have influenced the acceptance of reversible methods.

b. Those with program contact are more likely to use modern female methods, specifically female sterilization.

c. Social network through diffusion impacts method preference.

d. Influence of various socio-economic factors in choice differs between urban and rural areas.

RESEARCH DESIGN

To achieve the objectives of the research both secondary and primary data sources were used. The National Family Health Survey, NFHS-III was analyzed to see the determinants of choice. Secondary state level data was also analyzed to show how much contraceptive behaviour can be attributed to the regional effect.

Contraceptive choice is seen as a one step process in our study where the couple chooses a particular method from the available range of methods and also chooses not to use. Thus using contraception finally is the choice exercised.

In the primary data source qualitative methodology was used to collect the data. The process of decision making in urban and rural settings of couples was assessed by FGDs and in depth interviews. It is known that the extension activities of the program operate primarily in rural areas and to a smaller extent in the poor localities of urban areas. On the other hand, in urban upper class areas these would be minimal or absent. Therefore, in order to see whether the program workers play a role in choice, samples were proposed to be selected from three areas - rural, poor urban localities, and other urban localities. FGDs with women and in depth interviews with service providers would bring out the program's effect on the decision making process and also help examine whether there has been provider bias. In depth interviews were also undertaken with family planning service providers to understand the choice dynamics in these areas.

Analytical Framework

This study modified Bulatao's Framework and includes and drops various variables used by him in his original framework for assessing contraceptive choice at the individual level.

This study includes both individual and community level factors affecting individual decision of choice.

Contraceptive goals involve the specific fertility effect a woman or couple seeks to achieve through contraception. The proxy indicators used to define contraceptive goals are age, ever had an induced abortion, and number and sex of the living sons. Contraceptive competence is the ability to use a method effectively. Education level was used in this research to determine contraceptive competence. Contraceptive evaluation involves judgement about the practical and moral implications of using a specific method. The concept of evaluation can in principle be extended to cover all the relevant features of a method. Ethnicity, religion and knowledge about side effects are proxy indicators explaining contraceptive evaluation in this research paper. Contraceptive access is closely related to use. Promotion of a method - through the media, through face to face contacts, by program personnel, by physicians and so on – can significantly add to the choice of method. The affordability of a method to the individual is an additional issue; clearly, affordability is affected by the presence or absence of government subsidies. The variables like place of residence, standard of living, women's work status and mass media exposure are used as proxy indicators. This framework is a comprehensive package including both individual demand and supply side factors.

The independent variables for Bulatao's framework used in this study to make contraceptive choice operational are given below.

Factors in Choice	**Explanatory Variables**
Contraceptive goals	• Age of wife • Number and sex of the living children • Outcome of last pregnancy (ever had an induced abortion)
Contraceptive competence	• Knowledge of family planning methods • Education level a)Husband's education b)Wife's education
Contraceptive evaluation	• Ethnicity • Religion

	• Side-effects
Contraceptive access	• Standard of living • Place of residence • Family Planning Program effort • Social network

The framework for contraceptive choice below lists the important demographic and socio-economic factors along with their plausible influences.

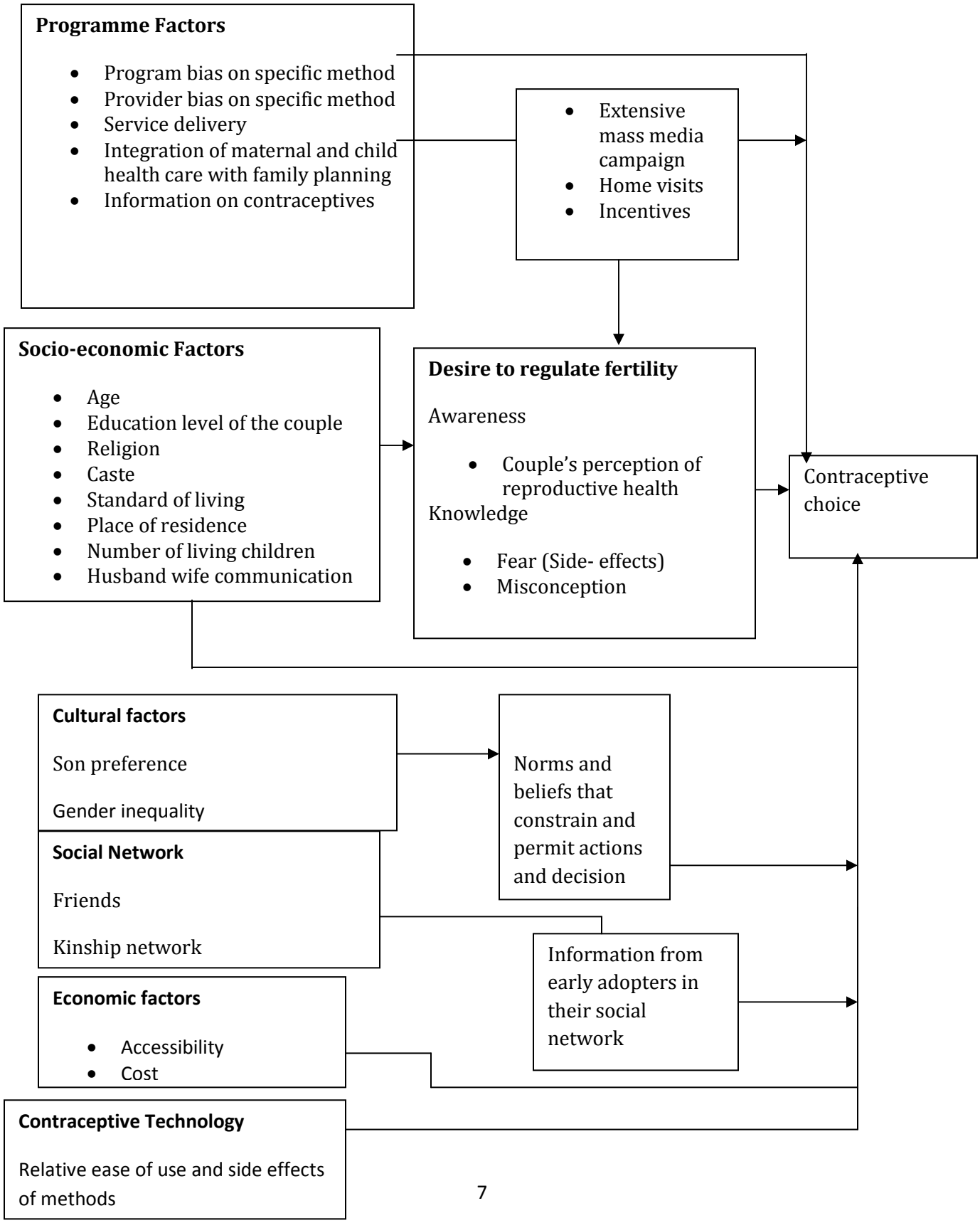
DATA SOURCE AND METHODOLOGY

National Family Health Survey-3(2005-2006)

The National Family Health Survey-3 (NFHS-3) provides estimates of important indicators on family welfare, maternal and child health, and nutrition. In addition, NFHS-3 provides information on several new and emerging issues, including family life education, safe injections, perinatal mortality, adolescent reproductive health, high risk sexual behavior, tuberculosis, and malaria. Further, NFHS-3 includes both women aged 15-49 years and all men aged 15-54 years, unlike the prior surveys. Information on nutritional status, including the prevalence of anemia, is provided in NFHS-3 for women aged 15-49 years, men aged 15-54 years, and young children. A unique feature of NFHS-3 is that it provides an estimate of HIV prevalence in the general population.

To identify the socio-economic and demographic determinants of contraceptive choice data from the NFHS-3 in West Bengal has been used. Only the women's questionnaire is used in this study. In West Bengal, the NFHS-3 included 5,992 households and 6,794 women in the age group of 15-49 years. Pregnant and in-fecund women have been excluded. Thus the model fitted in the sample used 6372 observations.

FRAMEWORK FOR CONTRACEPTIVE CHOICE



Primary Data Source

To complement the secondary data FGDs and in depth interviews were conducted. The gender aspects of contraceptive choice were discussed in FGDs with older (30-59 years) and younger (20-29 years) women. The FGDs were conducted with six to eight members from selected wards/ villages, with homogeneous characteristics such as age group, income, and caste in the study area.

In order to capture the program's effect on choice of contraception from the provider's perspective, in depth interviews were conducted with family planning service providers. This was expected to provide a clearer understanding of the program's role from the provider's side. These interviews covered issues on guidance given to the service providers by the departments, targets, mechanisms to achieve the targets, and how they gave advice to women. Besides, it also assessed their perception on women's contraceptive preference.

STUDY AREA AND SAMPLE SELECTION

The study areas were divided into urban and rural settings. For the urban areas four wards from Kolkata Municipal Corporation (KMC) were selected. The urban setting was further divided into poor localities and other localities. For poor localities, two wards with the lowest literacy rates (Ward 29 and Ward 58) and for the other, two wards with above average literacy were selected (Ward 125 and Ward 51 which are at 20th and 50th percentile to ensure proper representation).

For rural areas, four villages were selected, two from Bankura and two from Bardhaman, which are more than fifty kilometers from KMC and not dependent on Kolkata for their livelihood (i.e. not having routine contact with Kolkata) and having a high program presence. FGDs are conducted, with urban poor and with other urban localities as well as with persons from the four villages. In depth interviews were conducted with service providers, from urban areas and from rural areas.

METHODOLOGY

In this paper individual level analysis has been conducted to capture the effect of individual characteristics on contraceptive choice for the state of West Bengal with the help of NFHS-3 data on individual women. In the analytical framework choosing a contraceptive method is considered a one step process. Overall, women face the choice of modern spacing methods, traditional methods, terminal methods and no method. This can be modeled by multinomial logistic regression as the response variable has more than two categories and is not ordered.

Multinomial logistic regression is designed to use a mix of continuous and categorical predictor variables to predict a categorical outcome. It is often seen as an alternative to discriminant analysis.

Multinomial Logistic Regression:

If the response variable has three categories (P_1, P_2, P_3) then the multinomial logistic model will have two equations. Let the reference category be P_3 and X_1, X_2 and X_3 are predictor variables.

$\text{Log } P_1/P_3 = a_1+b_1X_1+c_1X_2+d_1X_3$……(a)

$\text{Log } P_2/P_3 = a_2+b_2X_1+c_2X_2+d_2X_3$……(b)

$P_1+P_2+P_3=1$

Unlike logistic regression the quantities P1/P3 and P2/P3 are not odds as numerators and denominators do not necessarily sum up to 1.

However, solving equations 'a' and 'b' the values of P1, P2 and P3 are as follows.

$$P1= \mathbf{e}^{a_1+b_1X_1+c_1X_2+d_1X_3}/1+\sum \mathbf{e}^{a_j+b_jX_1+c_jX_2+d_jX_3}$$

$$P2= \mathbf{e}^{a_2+b_2X_1+c_2X_2+d_2X_3}/1+\sum \mathbf{e}^{a_j+b_jX_1+c_jX_2+d_jX_3}$$

$$P3= 1/1+\sum \mathbf{e}^{a_j+b_jX_1+c_jX_2+d_jX_3}$$

Multilevel Model: Community factors are also important in affecting individual choice behavior. In multilevel models the interesting part is that characteristics from higher levels also influence or affect the lower level outcomes. Multilevel models have been used in this study as an ordinary logistic model assumes that all observations are independent. A multilevel model allows for the hierarchical nature of the data and corrects the estimated errors to allow for clustering of observation (Goldstein, 1995). The higher level referred to here is the community and the lower level is the individual or the micro level factors. However, we cannot use simple regression models to see how observed community level variables along with individual level characteristics affect individual behavior, because the unobserved factors at higher levels influence the lower level outcomes. This can give rise to

a multilevel error structure (Angeles *et. al*. 2005). In this study after clustering at PSU level (Primary Sampling Unit, villages in rural areas and census enumeration blocks in urban areas in the sample used) we want to see whether the effect of community factors are important in choice of individual contraceptive method selection. We develop our model at two levels, individual (level1), community (level2). The equation for basic two level models:

$$\mathbf{Y_{ij} = X_{ij}\beta + \alpha P_{ij} + Z_j\delta + \mu_j + \varepsilon_{ij}}$$

Where

$\mathbf{Y_{ij}}$: Categorical outcome for individual I from community j

$\mathbf{X_{ij}}$: Individual level explanatory variables

$\mathbf{P_{ij}}$: Program variable (could be community level)

$\mathbf{Z_j}$: Community level variables (contact with health workers)

$\boldsymbol{\mu_j}$: Community unobserved heterogeneity

$\boldsymbol{\varepsilon_{ij}}$: Individual level unobserved heterogeneity

i= 1, 2, 3……., N_j (individuals in community j)

j= 1, 2……..M (communities)

We used multinomial logistic regression to model this. There are numerous estimation procedures to treat clustering by geographic context. First standard multinomial logistic regression is done with standard error adjusted for unobserved community effects. Then the choice of permanent methods (sterilization) is dropped from our model and generalized linear latent mixed model (GLLAMM) is used, which is a class of multilevel latent variable model for (multivariate) responses of mixed types including categorical responses. The latent variable also known as common factor or random effect can be assumed to be discrete or to have a multivariate normal distribution with mean=0. GLLAMM is estimated by the maximum likelihood method. In simplest generalized linear mixed models, the dependence structure of clustered data is modeled by introducing a random intercept into linear predictor. The random intercept is shared by all units in the same cluster and can be interpreted as cluster level unobserved heterogeneity (Hesketh et. al. 2002). The GLAMM gives the variance at the cluster level and the standard error for it.

The GLLAMM does not give the interclass correlation ρ and its standard error or confidence interval. However, it can be calculated by:

$$\rho = \sigma^2\mu / (1+ \sigma^2\mu)$$

The value of ρ will be significant if it is significantly different from zero. This paper focuses on the example of using GLAMM with NFHS-III data for the state of West Bengal.

Based on logistic regression, predicted probabilities are computed for each category of the explanatory variable. These are presented in a manner similar to adjusted mean in a multiple classification analysis. This allows understanding the net influences of explanatory factors after controlling other factors, in terms of probability.

Quantitative analysis is done in the software Stata 10.0 version and qualitative data was analyzed using Atlas/ti 5.0 version.

Findings: NFHS-3 data

Determinants of method choice

The predicted probabilities as in multiple classification analysis (Table 2) for simple multinomial logistic regression in which cluster effect is not considered shows the effect of contraceptive goals, the couple's competence to effectively use a method, contraceptive evaluation, contraceptive access and program effort. In this model probabilities of choice for modern spacing methods, terminal methods and traditional methods are compared with women not using any method and are not pregnant and fecund.

Overall in West Bengal the contraceptive choice scenario is driven by terminal methods choice and traditional methods, but the findings bring out varying characteristics of the subgroups of women. The total percentage figure shows a skew towards traditional methods choice in West Bengal.

Women aged 25-34 years are more likely to use (current use) modern spacing methods and traditional methods. Choice of terminal methods use shows a positive association with age. Interestingly, women who have ever had an induced abortion show an association with traditional methods choice as well as modern methods choice. Looking at Table 2 we can conclude that the number and sex of the children is an important predictor of contraceptive choice in West Bengal. A woman with one son has a different contraceptive goal so generally prefers modern spacing methods or traditional methods, but as soon as the number of sons increases to two, the women tend to limit their family size in West Bengal.

Education also has a very significant effect on contraceptive choice. Education raises the chance of selection of both modern spacing methods and traditional methods. However, if we focus only on educated women we see that they are more likely to use traditional methods than modern spacing methods or terminal methods. The effect of religion is seen with Muslims generally choosing non-terminal methods. Hindus use more traditional methods as well as terminal methods but an equal amount of modern spacing methods. The effect of caste is not that much except for the relatively greater adoption of terminal methods by Scheduled Tribes and the Scheduled Castes.

The place of residence significantly affects the preference for traditional methods in West Bengal as the percentages are tilted toward the use of traditional methods as compared to modern spacing, terminal and no method use if we focus on women staying in urban areas. For those dwelling in urban areas, the standard of living (proxy for economic status) seems to affect only the preference for traditional methods both significantly and positively. Mass media exposure works on all the methods positively, that is, if a woman is exposed to mass media she will use modern spacing methods, terminal methods and traditional methods more than a woman who has not had similar exposure. The predicted probabilities represented as in a multiple classification analysis (Table 2) show that though work status has a significant effect on choice of method; it works inversely with all method choices.

Following this we ran the random intercept multinomial logistic regression with generalized linear latent mixed model (GLLAMM) with modern spacing methods, traditional methods and no method choice as a dependent variable and the other predictors were the same as the above model. The results in the form of predicted probabilities represented as in a multiple classification analysis (Table 3) reinforce the above findings. In this model one more community variable had been included that is, mean health contact with health service providers, but this had no significant results. Additionally it was seen that community level factors were important in contraceptive choice of modern spacing or traditional versus non use of method. The covariance at the community level (Table 3) $\sigma 2\mu$ is 0.19285763 and the standard error is (.04306341). The interclass variance ρ is 0.161 which is highly significant. Thus there is variation in choice of contraceptives among the Primary Sampling Unit (PSU) due to some community effect. Since the community was significantly affecting individual level contraceptive choice we need to consider more community variables at the PSU level or higher levels in the choice of the contraceptive model. Thus qualitative enquiry was done to recognize the community factors in villages or urban blocks that affect micro-level decision of choice of a contraceptive. Social network variables and also the presence of provider bias, and contact with health worker were assessed by FGDs with women in the villages and urban wards of three districts of West Bengal.

Traditional contraceptive methods are important and distinct in West Bengal so simple logistic and random intercept logistic regressions were also run to see their choice of traditional methods versus modern methods and also the community's effect on choosing traditional methods (Table 4 and 5). The interclass correlation ρ is significant so one should delve deeper into considering more community level variables which affect individual decisions.

The determinants of modern methods over traditional methods among contraceptive users were as follows: age, number of living sons, education and mass media exposure, which were significantly related to choice of modern spacing methods over traditional methods.

The findings bring about some important revelations that in West Bengal, educated women have fewer births, but they are more likely to use traditional methods. In Table 5 the negative impact of education can be explained. Education has a relatively higher effect on choice of modern spacing methods over traditional methods. With education, the use of both traditional and modern spacing methods increase, but education seems to be more important for the choice of modern methods.

The NFHS-3 data analysis demonstrates that the pattern of contraceptive methods choice differs considerably by individual characteristics as well as by geographic areas. It shows that significant variation exists between villages and census enumeration blocks (CEBs) in choice of traditional methods as well as modern spacing, choice of traditional methods versus no method calling for the consideration of village, CEBs and also higher level cluster variables like the district in the analysis to refine the results.

Determinants of method choice in urban areas and rural areas

One of the objectives of this study was to see whether the determinants of method choice vary by urban and rural place of residence. NFHS-3 data for urban West Bengal has been used (3449 women) to run the GLLAMM model to see the effect of both individual and community level variables in choice of method in urban areas. The community in urban areas is clustered into 119 CEBs, in West Bengal. The dependent variable is contraceptive choice: modern spacing methods, terminal methods, traditional methods and no method. The predictor variables are the same as the above models except that place of residence has been dropped.

The predicted probabilities computed and presented as in multiple classification analysis (MCA) Table 6 of random intercept multinomial logistic regression of urban West Bengal shows that the age 25-34 years is significant in choosing modern methods. The percentage choosing modern methods in this age is higher compared to younger (15-24 years) and older ages (35-49 years). Contrastingly the choice of terminal methods seems to have a

positive correlation with age in urban West Bengal. The choice of traditional methods is similar to the choice of modern spacing methods when it comes to age. Women in the age group of 25-34 years are more likely to choose traditional methods in urban areas than women in the age group of 15-24 years. 35-49 year old women will also not opt for traditional methods.

Women who have had an induced abortion in urban areas are significantly associated with modern spacing methods as well as traditional methods. Modern spacing methods and traditional methods have a positive association with education level which is significant. On the other hand women with higher education in urban areas tend not to choose terminal methods. Other than education, being a Muslim still has a significant effect on choice. Muslim women in urban West Bengal tend to choose modern spacing methods more than traditional and terminal methods. Similarly, scheduled caste (SC) women in West Bengal are less likely to go for terminal methods. SC women are more likely to prefer modern spacing methods compared to traditional methods. Interestingly work participation has a negative impact on choice of all the categories of contraception except no use. Mass media in urban West Bengal only significantly affects choice of modern spacing methods. Standard of living has no effect in urban West Bengal. The interclass correlation ρ is significant and thus it can be concluded that community factors are important in affecting contraceptive decision in urban areas of West Bengal.

The random effect model has more robust standard error than the fixed effect model.

In rural areas as in urban areas (Table 7), age 25-34 years significantly affects choice of modern spacing methods, traditional methods and also terminal methods. In this age, choice of modern spacing methods as well as traditional methods goes up while the choice of terminal methods has a positive correlation with age that is, at higher (35-49 years) ages the choice of terminal methods is high. Women who have had an induced abortion only significantly affect higher probability of traditional methods preference in rural areas. The number of sons has a consistent significant affect on choice in both urban and rural areas. In rural areas education has only a significant negative effect on choice of terminal methods. Being Muslim has no consistent effect on choice in rural areas nevertheless Muslim women are less likely to choose terminal methods. This effect is significant. In urban areas we see that the standard of living has no significance in choice. On the other hand in rural areas standard of living has a significant positive effect on the choice of traditional methods. Work status again has a negative impact on choice of methods, specifically traditional and modern spacing methods. Mass media exposure, one of our community level program variables, seems to affect only preference of modern spacing methods. The interclass correlation ρ is significant in this model also so there is a need to concentrate more on community variables affecting individual choice. Thus the overall age,

number of living sons and having had an induced abortion is consistent in choice of method. However, education, standard of living, religion, work status and mass media exposure also are important predictors in method choice, but their effect varies in urban and rural models. Besides, community variables seem to consistently affect individual choice in all of our three random effect models. Thus primary enquiry is called for looking at the factors behind the significance level of the predictors.

Findings: Qualitative data

Provider Bias

West Bengal has experienced fertility transition increases in contraceptive use; much of the contraceptive increase is contributed to by use of female methods. This part of the research study is trying to evaluate whether provider bias affects individual contraceptive choice.

The in depth interviews and FGDs with service providers were done with the intention of isolating provider bias and choice of a particular method.

Urban: The role of service providers is mainly in the poor localities (slums) of Kolkata. Ward 29 and Ward 58 have a high slum population. In Ward 29 the Muslim population is very high. The contraceptive choice among the Muslim women inhabiting this place is interesting. It was reported that the mobile clinic which comes once a week gives contraceptive injections free of cost. Moreover, the providers also encourage the Muslim women to take up contraceptive injections because they are directed to do so by the higher authorities. The NGO providers as well as the government providers stated that the Muslims do not want to go for female sterilization because of their religious beliefs, "*among them after death there is a prayer that does not happen if somebody is ligated*" (FGD with KMC Health worker, Ward 29). Thus Muslims in this area generally go for pills as a terminal method. The private providers are sensitive towards the local preference for contraceptive injections in this area and thus are promoting contraceptive injections. Hence Muslim women are influenced mainly because of their knowledge about injections through provider bias and the cost. Additionally a health service provider remarked on religion effecting choice: "*husbands don't want to use condoms, pills create health problems but if they take injections they feel that there is no problem any more, Cu-t doesn't suit them and ligation they will not do*".

In another slum mostly dominated by SCs and STs the NGO, FPAI was providing contraceptive injections for Rs 200 but the women did not want to take it because it was expensive compared to the pills which came for Rs 10 a month. On the other hand in slums where the NGO was not providing free contraceptive injections, the health workers were hardly aware about the injections or promoted it.

It was also reported by the KMC health worker that awareness about AIDS through mass media had triggered condom use among Muslims.

Other than injections, IUDs also seemed to have a provider bias for the Muslim population in general. It was reported by both male and female health workers of a NGO that if they are not able to convince a Muslim women about laparoscopy after two children due to religious reasons they motivated the women to opt for IUDs.

One of the health workers of Bengal Social Service League (gets government funding) remarked that "*now we are told to focus on vasectomy but we cannot motivate anyone because there is tubectomy, so nobody wants to do vasectomy easily.*"

All the providers in our poor urban site spoke about target free approach and informed consent. Contradictorily they were promoting particular methods. One of the providers said that they had to submit targets at the "*commencement of each year we have to give a target for laparoscopy, IUD, pills and condom but now our grants are not sanctioned on the basis of targets.*"

Additionally it was remarked by a provider that it was not difficult for them to meet the targets of laparoscopy as nowadays the clients came to them without motivation or home visits.

Rural

The AWW in a village in Bardhaman District and female Health Assistant in one of the villages in Bankura District spoke clearly about higher authorities ordering them to promote Cu-t, however in villages Cu-t is not a preference. The AWW remarked "*We are now told to promote Cu-t but nobody wants to take it*". Besides, it was reported that "*Now Cu-T is mostly discussed in the monthly meetings with mothers as we have to fulfill targets*".

After Cu-t the providers promoted vasectomy in the rural areas, camps are held in the BPHC (Block Primary Health Centre) but it was reported that no one was interested in these.

In our four villages it seemed that the targeted approaches still exist. The female Health Assistant and AWWs of two villages said that they were given targets mostly for Cu-t and vasectomy. Interestingly the health providers informed us that now they do not have to go house to house to convince women about tubectomy and bring them to the camps, but the women are motivated to come to the camps on their own.

Interestingly in another village the ANM narrated she always had negative experience with Cu-T. Her own sister had also had a bad experience so she personally does not suggest it to anybody. She also stated that there had also been a negative incident with Cu-t in the village, so people are scared to use it and said she was also biased because of her negative experiences. Besides, she feels that it is a problem the poor people who chooses Cu-t to go to government doctors (if there is problem) who are about 15 kilometers away which is expensive.

Discussions

The major objectives of the study were to identify the factors in contraceptive choice and also the differences in factors affecting contraceptive choice between rural and urban areas and the role of the government family planning program and the social network in choice.

The findings suggest that individual socio economic factors as well as community factors are important in the choice of contraceptive methods in both rural and urban areas. Moreover, there is a difference in the determinants of choice of method in urban and rural areas. Education in both rural and urban areas and standard of living in rural areas is associated with the choice of traditional methods. The research study by Gereltuya *et al* (2007) on determinants of current contraceptive use and method choice in Mongolia replicates the findings in this study that educated women have a higher probability of choosing traditional methods, but residence in rural areas in Mongolia is associated with choice of traditional methods whereas in the present research women residing in urban areas have a higher probability of choosing traditional methods.

The Family Planning Program factor plays a major role in choice. In rural areas the government's Family Planning Program seems to play a major role whereas in urban areas both public and private institutions are shaping choices. The presence of NGOs in urban poor areas has created a demand for injectables mostly among the Muslims as a relief from compliance related to pills. Though there is a distinct provider bias to push Cu-t in rural areas because of poor infrastructure (roads) and health facilities in and around the villages, rural women are apprehensive about using IUDs anticipating further costs and its imputative side effects. This explains declining IUD statistics in West Bengal to some extent.

Religion has a profound effect on choice. Pills were chosen as a terminal method among older Muslim women in urban slums as the sterilization operation was perceived to be a sin.

The paper shows that male sterilization was opted out of in an environment of gender disparity and ignorance and not as a result of shift in program bias against female methods per se in both urban and rural areas.

From the multilevel analysis the overall importance of community factors in affecting individual choice in West Bengal was seen. Moreover, the random intercept model for urban and also rural, community affect has come out to be very significant. Thus relating it with the quantitative findings, it is observed from the qualitative data that few proxies for community factors in urban as well as rural areas influence choice of an individual. A research study in Mongolia also (Gereltuya *et al*, 2007) reveals how contraceptive method choices differ considerably because of individual characteristics as well as geographic areas.

In this study population, women in urban settings also frequent private facilities for contraception, but in rural areas the public facilities are usually the only options.

The research could isolate few proxies for community factors in villages like health provider bias, misconception or knowledge about a method, moving through a particular social network, migration within a village and the presence or absence of health services. In urban areas it is limited to the presence of the government or a NGO affecting choice. Social network also affects choices in poor urban localities.

Generally we see that in middle class urban areas there is a tendency among couples not to use modern methods because of the fear of side-effects.

Thus is important to consider community level factors in program to increase contraceptive use. . The qualitative findings suggests that the program needs to consider provider bias and social networks since they can greatly influence individuals and communities as inferred from the quantitative findings that both level matters.

The main limitation of the study was the secondary data source had no community level variables either at the village level or at the level of the CEB in the urban areas. Consideration of higher level community variables in the analysis would have refined the results.

Policy Implications

In West Bengal the use of traditional methods was known and was prevalent for a long time, which shows a latent desire to control family size among the population.

From the findings it was seen that the use of traditional methods like withdrawal can be promoted in combination with condom use in rural areas to increase the choice basket

where women have referred to the absence of PHCs as a reason for not using IUDs. Other than mass media, contraceptive promotion can be linked to self help groups of women. Follow up services for IUD are important. The NFHS-3 data analysis demonstrates that the pattern of contraceptive method choice differs considerably by individual characteristics as well as by geographic areas. It was found that significant variation exists between villages and CEBs in choice of traditional methods as well as modern spacing, traditional methods versus no method calling for consideration of village, CEB and also higher level cluster variables like the district in the analysis to refine our results. Specific requirement based strategies like migration of males in specific villages should be observed by ANMs to counsel about specific contraceptive method choice.

Thus the Family Planning Program should weave in interventions that aim at changing social norms, which will lead to change in behavior, rather than just providing services. The NFHS-3 data reveals that community factors are very important in choosing traditional methods over modern spacing methods and no method.

Table: 1 List of Variables used in Multinomial Logistic Regression and GLAMM Models

Predictor Variables	Categories	(RC=Reference Categories)
Age		
	15-24	15-24
	25-34	
	35-49	
Abortion (Have you ever had an induced abortion)		
	No	No
	Yes	
No. of Sons		
	0	0
	1	
	2	
	3+	
Education		
	Primary	Primary
	Secondary	
	Higher	
Religion		

	Hindu	Hindu
	Muslims	
	Others	
Caste		
	Other castes	Other castes
	OBC	
	SC	
	ST	
Place of Residence		
	Rural	Rural
	Urban	
Standard of Living		
	Low	Low
	Medium	
	High	
Women Work		
	No work	No work
	Work	
Mass Media		
	No mass media exp	No mass media exp
	Mass media exp	
Contact Health Workers		
	No health contact	no health contact
	health contact	
Response Variable		
Modern Spacing Method		
Terminal Method		
Traditional Method		
Not Using		Not Using

Table: 2 Predicted percentages of contraceptive choice among currently married women using simple multinomial regression, West Bengal, 2005-06

Predictors	Modern spacing	SL	Terminal method	SL	Traditional method	SL	Not using RC
	Adjusted		Adjusted		Adjusted		Adjusted
	Values of P1		Values of P2		Values of P3		Values of P4
Total	16.43		15.91		23.36		44.30
Contraceptive Goal							
Age							
15-24 (RC)	18.28		4.79		14.88		62.05
25-34	21.65	**	23.49	**	26.69	**	28.17
35-49	8.46		31.48	**	25.48	**	34.58
Ever had an induced abortion							
No(RC)	15.95		16.25		22.68		45.12
Yes	19.56	**	13.69		27.89	**	38.87
Sons							
0(RC)	8.96		5.81		16.78		68.44
1	22.82	**	25.44	**	28.12	**	23.62
2	19.17	**	37.23	**	20.89	**	22.71
3+	20.87	**	29.69	**	17.42	**	32.02
Contraceptive Competence							
Education							
Primary (RC)	13.63		23.23		20.18		42.97
Middle	17.49		12.44	**	25.04		45.03
Higher	27.23	**	4.56	**	30.10	**	38.11
Contraceptive Evaluation							
Religion							
Hindu(RC)	16.08		20.01		24.23		39.68
Muslims	16.59	**	7.95	**	19.88	**	55.57
Others	11.70		14.23		20.96		53.12
Caste							
Other castes (RC)	17.18		15.27		23.17		44.37
OBC	18.21		13.64		20.08		48.07
ST	13.75		9.52	**	26.47		50.26
SC	14.13		19.96	**	23.79		42.13
Contraceptive Access							
Place of Residence							
Rural (RC)	17.32		17.64		25.11		39.93
Urban	15.59	**	14.45	**	21.81	**	48.16
Standard of living							
Low(RC)	15.95		16.85		19.69		47.50
Medium	15.69		16.62		24.91	**	42.78
High	17.26		14.72		24.89	**	43.13
Women Work							
No work (RC)	17.62		16.13		26.09		40.15
Work	13.70	**	15.00	**	17.84	**	53.47

Programme Effort							
Mass Media							
No mass media exp(RC)	13.37		15.47		22.27		48.89
Mass media exp	18.08	**	16.05	**	23.82	*	42.05

*=Significant at 5 % level of significance **=Significant at 1% level of significance

SL-Significance level, RC-Reference Category

Table: 3 Predicted percentages of contraceptive choice among currently married women using random intercept multinomial logistic (Maximum Likelihood Estimation), West Bengal, 2005-06

Predictors	**Modern Spacing Adjusted values of P1**	**SL**	**Traditional Method Adjusted values of P2**	**SL**	**No Method (RC) Adjusted values of P3**
Total	17.16		24.59		58.25
AGE					
15-24 (RC)	17.77		14.29		67.94
25-34	26.49	**	33.08	**	40.43
35-49	9.72	**	29.97	**	60.31
Ever had an induced abortion					
No(RC)	16.77		24.00		59.23
Yes	19.68	*	28.48	**	51.84
No. of Sons					
0(RC)	8.01		15.60		76.39
1	27.46	**	33.37	**	39.18
2	29.38	**	31.23	**	39.39
3+	28.36	**	22.95	**	48.70
Education					
Primary(RC)	15.40		23.20		61.40
Secondary	17.70	*	25.42		56.88
Higher	25.88	**	27.91	**	46.21
Religion					
Hindu (RC)	17.87		26.86		55.26
Muslims	15.34	*	19.00	**	65.66
Others	12.14		22.34		65.52
Caste					
Other castes (RC)	17.91		24.25		57.84
OBC	20.30		22.71		56.99
SC	14.97		25.51		59.53
ST	13.71		27.56		58.73
Place of Residence					
Rural (RC)	17.32		27.19		55.49
Urban	16.97		22.47		60.56
Standard of living					

Low (RC)	16.37		20.87		62.76
Medium	16.62		26.38	**	56.99
High	18.06		25.95	**	55.99
Mass Media					
No mass media exp (RC)	13.71		22.98		63.31
Mass media exp	19.05	**	25.29	*	55.66
Women Work					
No work (RC)	18.46		27.43		54.12
Work	14.28	**	18.89	**	66.83
Contact Health Workers					
No health contact (RC)	15.39		25.70		58.90
Health contact	26.95		19.48		53.56
Level 2 variance ($\sigma^2\mu$)	0.19285763 (.04306341)				
P	0.1616**				

SL=significance level

*=Significant at 5 % level of significance

**=Significant at 1% level of significance

Table: 4 Predicted percentages of choice for traditional methods among currently married women using either traditional methods or modern methods of contraception with the help of logistic regression, West Bengal, 2005-06

Predictor variables	**Traditional method**	**SL**
Total	41.36	
Contraceptive Goal		
Age		
15-24 (RC)	55.36	
25-34	45.09	**
35-49	24.43	**
Ever had an induced abortion		
No(RC)	41.31	
Yes	40.82	
Sons		
No. of Sons		
0(RC)	35.37	
1	43.60	**
2	48.30	**
3+	54.38	**
Contraceptive Competence		
Education		
Primary (RC)	39.82	
Medium	41.27	
Higher	49.16	*

Contraceptive Evaluation		
Religion		
Hindu(RC)	39.72	
Muslims	45.62	
Others	39.66	
Caste		
Other castes (RC)	42.61	
OBC	46.23	
SC	32.14	
ST	37.52	
Contraceptive Access		
Place of Residence		
Rural (RC)	40.49	
Urban	41.89	
Standard of Living		
Low(RC)	44.13	
Medium	38.88	
High	41.08	
Women Work		
No work (RC)	36.87	
Work	43.43	
Programme Effort		
Mass Media		
No mass media exp(RC)	40.13	
Mass media exp	43.71	*

*=Significant at 5 % level of significance **=Significant at 1% level of significance

Table: 5 Random intercept logistic regression showing the effect of community on choice of traditional method among users (Dependent Variable: Modern Method Vs Traditional Method), West Bengal, 2005-06

Random-effects logistic regression — Number of obs = 2069
Group variable: v001 — Number of groups = 205

Random effects u_i ~ Gaussian — Obs per group: min = 2
avg = 10.1
max = 25

Wald chi2(18) = 117.20
Log likelihood = -1322.5763 — Prob > chi2 = 0.0000

choicel	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
age1	.4630256	.1279473	3.62	0.000	.2122535	.7137978
age2	1.45356	.1566972	9.28	0.000	1.146439	1.760681
abr	.0111887	.1315546	0.09	0.932	-.2466536	.269031
sons_cd1	-.3508756	.1150232	-3.05	0.002	-.5763169	-.1254342
sons_cd2	-.4784055	.1658387	-2.88	0.004	-.8034434	-.1533675
sons_cd3	-.7739239	.2522207	-3.07	0.002	-1.268267	-.2795804
eduM	-.0905712	.1294132	-0.70	0.484	-.3442163	.1630739
eduH	-.4531256	.1953469	-2.32	0.020	-.8359985	-.0702528
Mus	-.3176544	.1595975	-1.99	0.047	-.6304598	-.0048491
oth	.1742151	.4432008	0.39	0.694	-.6944425	1.042873
OBC	-.2192278	.28482	-0.77	0.441	-.7774647	.339009
ST	.2765625	.3642209	0.76	0.448	-.4372974	.9904224
SC	.239559	.1526031	1.57	0.116	-.0595375	.5386556
urban	-.0940588	.1582169	-0.59	0.552	-.4041582	.2160405
sslim	.2460079	.1472845	1.67	0.095	-.0426645	.5346803
sslih	.1035631	.1620981	0.64	0.523	-.2141433	.4212694
mmexp	-.2608458	.1312199	-1.99	0.047	-.5180321	-.0036594
v714	-.1561635	.1220194	-1.28	0.201	-.3953171	.0829902
_cons	.2544043	.2008177	1.27	0.205	-.1391912	.6479998
/lnsig2u	-.8170524	.2361566			-1.279911	-.354194
sigma_u	.6646291	.0784783			.527316	.8376985
rho	.118376	.024646			.0779337	.1758036

Likelihood-ratio test of rho=0: chibar2(01) = 51.27 Prob >= chibar2 = 0.000

Table: 6 Predicted percentages of contraceptive choice among currently married women using random intercept multinomial logistic (Maximum Likelihood Estimation), Urban West Bengal, 2005-06

Predictors	Modern spacing Adjusted values of P1	SL	Terminal method Adjusted values of P2	SL	Traditional method Adjusted values of P3	SL	Not using (RC) Adjusted values of P4
Total	17.26		13.01		22.66		47.07
Contraceptive Goal							
Age							
15-24 (RC)	17.66		3.85		9.63		68.85
25-34	24.12	**	18.25	**	31.06	**	26.57
35-49	9.12		23.51	**	29.14	**	38.23
Ever had an induced abortion							
No(RC)	16.63		12.97		22.24		48.16
Yes	21.61	**	13.13		25.18	*	40.07
Sons							
No. of Sons							
0(RC)	9.27		5.16		15.09		70.48
1	27.72	**	21.31	**	28.67	**	22.30
2	19.38	**	37.48	**	23.36	**	19.78
3+	23.02	**	32.35	**	16.81	**	27.82
Contraceptive Competence							
Education							
Illiterate(RC)	9.93		26.36		17.78		45.93
Primary	17.03	*	19.59		17.51		45.88
Middle	17.49	**	11.01	**	23.69		47.81
Higher	28.11	**	4.87	**	28.18	**	38.84
Contraceptive Evaluation							
Religion							
Hindu(RC)	17.31		15.14		24.93		42.62
Muslims	15.90	**	6.77	**	14.52	**	62.81
Others	15.17		13.39		23.90		47.55
Caste							
Other castes (RC)	17.41		12.19		22.67		47.73
OBC	22.53		11.37		21.01		45.08
SC	26.37		6.22	**	24.55		42.86
ST	15.59		17.81		22.51		44.08
Contraceptive Access							
Standard of Living							
Low(RC)	16.67		13.64		20.67		49.02
Medium	17.01		13.99		23.70		45.30
High	17.47		12.47		22.54		47.53
Women Work							
No work (RC)	18.47		13.37		26.49		41.68
Work	14.09	**	11.67	**	15.12	*	59.13

Programme Effort							
Mass Media							
No mass media exp(RC)	13.69		12.22		21.34		52.74
Mass media exp	18.05	*	13.16		22.89		45.90
Level 2 variance ($\sigma^2\mu$) (random effect)	0.20379413 (.0627877)						
P	.1693**						

*=Significant at 5 % level of significance **=Significant at 1% level of significance
RC= Reference category

Table: 7 Predicted percentages of contraceptive choice among currently married women using random intercept multinomial logistic (Maximum Likelihood Estimation), Rural West Bengal, 2005-06

Predictors	**Modern spacing**		**Terminal method**		**Traditional method**		**Not Using**
	Adjusted		**Adjusted**		**Adjusted**		**Adjusted**
	values of P1	**SL**	**values of P2**	**SL**	**values of P3**	**SL**	**values of P4**
Total	17.69		14.66		24.49		43.16
Contraceptive Goal							
Age							
15-24 (RC)	20.14		4.02		20.57		55.27
25-34	23.23	**	21.18	**	24.91	**	30.68
35-49	9.84		30.82	**	23.01	**	36.34
Ever had an induced abortion							
abr_No(RC)	17.29		15.29		23.39		44.03
abr_Yes	19.94		10.92		32.11	**	37.04
Sons							
No. of Sons							
sons_cd0(RC)	10.72		6.00		19.91		63.37
sons_cd1	23.16	**	28.06	**	26.82	**	21.96
sons_cd2	23.93	**	36.32	**	19.23	**	20.52
sons_cd3+	25.69	**	27.43	**	19.91	**	26.97
Contraceptive Competence							
Education							
Illiterate(RC)	13.06		23.83		26.31		36.79
Primary	15.88		21.55		24.48		38.09
Middle	17.46		14.41	**	26.04		42.09
Higher	25.37		4.85	*	15.61		54.18
Contraceptive Evaluation							
Religion							
Hindu(RC)	17.42		18.18		24.04		40.36
Muslims	19.65		6.20	**	25.89		48.25
Others	4.21		10.15		11.42		74.22
Caste							
Other Castes (RC)	18.72		14.39		24.10		42.79
OBC	18.14		12.77		23.69		45.39

SC	16.09		9.35		31.51		43.05
ST	13.66		16.27		25.97		44.10
Contraceptive Access							
Standard of Living							
ssliL (RC)	16.78		15.90		16.65		50.67
ssliM	15.89		14.83		24.10	**	45.18
ssliH	18.65		14.28		26.28	**	40.79
Women Work							
No work (RC)	18.95		14.87		25.66		40.51
Work	14.93	**	14.03		21.77	**	49.27
Programme Effort							
Mass Media							
No mass media exp(RC)	13.90		14.64		22.91		48.55
Mass media exp	18.53	**	14.63		24.78		42.05
Level 2 variance ($\sigma^2\mu$) (random effect)	0.27555386 (.07575707)						
P	0.2161**						

*=Significant at 5 % level of significance **=Significant at 1% level of significance, RC= Reference category