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REPRODUCTIVE HEALTH OF WOMEN WITH SPECIAL REFERENCE TO WEST BENGAL

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Abstract:

A reproductive health approach recognizes that the foundations of women's health are laid in childhood and adolescence, and are influenced by factors such as nutrition, education, sexual roles and social status, cultural practices, and the socioeconomic environment in all phase of life. The present paper is to conduct the reproductive health profile of women of age group i.e. age 15 to 49 of 19 districts of West Bengal based on unit level district level household and Facility survey-4. An index is constructed to represent health of reproductive women i.e. Safe Motherhood Index (SMHI) district wise accordingly. Using Binary Logit Regression Analysis, this paper seeks to identify the factors determining the for reproductive health status of women in West Bengal. It is found that caste, religion, mother education and financial assistance from government play important role for reproductive health of women.

Key words- Reproductive health, Women, Safe motherhood.

I. INTRODUCTION

“When women thrive, all of society benefits, and succeeding generations are given a better start in life”.

–Kofi Annan

In any society like India reproductive health of women is an important factor in the perspective of the human development and basic human rights. Early entry into married life affects adversely the normal reproductive life. India is still one of the countries ridden with child marriages, more so for girls. Nearly half of married women (ages 15 to19) have had at least one child. **While regional disparities exist, child marriage has significantly decreased from 47 per cent (2006) to 27 per cent (2016).** Child marriage impacts on almost all facets of reaching the Millennium Development Goals. It is for this reason that combating the problem is a key feature of the post-2015 MDG agenda and a major priority for UNICEF in India. (UNICEF-2016). It is estimated at the global level that girls aged 15-19 are twice as likely to die from childbirth as are women in their twenties, while girls younger than age 15 face a risk that is five times higher (UNFPA-2005). Moreover, more adolescent girls die from pregnancy-related causes than from any other cause. Maternal mortality reflects one of the shameful failures of human development (Freedman et al 2003) and maternal death due to these causes can be avoided with key health interventions, like provision of antenatal care and medically assisted delivery (Adam et al. 2005, McCaw-Binns. et al 1995). In a study from 125 developing countries, it is found total fertility rate is negatively related to reproductive health (Wang, 2001). Jose (2008) argued women's malnutrition and reproductive health be viewed as an important issue of human development. Therefore for the policy perspective, we have to identify various reason and factors that have significant effect on reproductive health of women.

Antenatal care is one of the basic and important indicators of maternal care on which the health of mother and new born depend. Systematic antenatal care was first introduced early in the 20th century in Europe and North America and is now almost universally prevalent all over the world (Rooney, 1992). A large number of studies have been conducted both empirically and theoretically to explore the status of reproductive health of women in India and its states. Navanethan and Dharmalingan (2000) have tried to explain that the relationship between social factors and health care facilities. They found that community health workers (ANM) play an important role in providing services to expecting mothers in rural areas of south Indian states. Raj and Raj (2004) provides an excellent explanation in a caste-based Indian society that women of the lower castes are the worst hit, as they suffer from double discrimination: first, in the patriarchal society women are discriminated against men, as they have to bear the burden of household work demanding much time and energy without adequate compensatory diet, and second, a lower-caste woman, owing to her poor socioeconomic status, also experiences social deprivation. Both these factors are detrimental to the health status of women, especially their reproductive health. There are significant inequalities in maternal health status across the

states of India. Wide disparities are found in extending health services among various social groups like SC, ST, OBC and religious groups (Roy et al, 2004).

Under this backdrop, the main objective of this paper is to examine the nature and pattern of reproductive health status of women in India with special reference to districts of West Bengal. Attempts have been made to explore the determinants of safe motherhood in the districts of West Bengal. For convenience rest of the paper is organised as follows. After the introduction, section II deals with the data sources and methodology, Section III deals with nature and trend of safe motherhood across the states of India and districts of West Bengal. Section IV deals with reproductive health of women and determinants of safe motherhood in West Bengal. The conclusion of the study appears in section V.

II. Sources of Data and Methodology

1. Data Sources:

The study utilises fact-sheet and unit level data from The District Level Household and Facility Survey-4 (2012-13). This is the fourth round of the district level household survey which was conducted during 2012-13. Just for the state level presentation of reproductive health status fact sheet of Annual Health Survey (AHS-2013-13) is referred for the EAG states and Assam, where DLHS was not conducted. The main objective of DLHS was to provide reproductive and child health related database at district level in India. DLHS-4 provides data on age at marriage, extent of ANC, PNC, and place of delivery including the educational status of the women under reproductive age group. DLHS-4 surveyed a total of 24,836 ever married women in reproductive age between 15 to 49 years with 94.4 percent response rate in West Bengal. Here for the analysis we use the district level and state fact sheet and the unit level data of ever married women who belongs to age group 15 to 49 and the data of Clinical, Anthropometric and Bio-Chemical tests (CAB) of Ever Married Women (age 15-49) from DLHS-4 and the respective date of DLHS-3.

2. Methodology

The study area is restricted to 19 districts of West Bengal.

a) **Safe Motherhood Index.** The index is measured by the normalized inverse Euclidean distance of the dimension indices from their ideal values (Sarma, 2008). In the first place, we have calculated the dimension index for each indicator of safe motherhood. However, comprehensive index of safe motherhood (SMHI), is computed by using the following formula:

$$SMHI = 1 - \sqrt{\frac{(1-d_1)^2 + (1-d_2)^2 + (1-d_3)^2 + (1-d_4)^2}{4}}$$

The safe motherhood index is constructed using the following four dimensions.

Dimension I- Antenatal Care (ANC): Here we take percentage of women who took three or more ANC visit.

Dimension II – Postnatal Care (PNC): A postnatal period is immediately after the birth of a child and exceeding for about six weeks. Here percentage of mother who received post natal care within 48 hours of institutional delivery is taken.

Dimension III- Institutional Delivery Care: It is a known fact that giving birth in medical institutions under the supervision by trained health care providers increases the chance of child survival and reduces the risk of maternal mortality.

Dimension IV- Non-anaemic Women: Haemoglobin level is the indicator which detects whether a person is anaemic or non anaemic. In this round first time in DLHS-4 Clinical Anthropometric Biochemical (CAB) Test is done. From the unit data the women of age group 15-49 whose haemoglobin label is >11gm/dl are treated as non anaemic person. From the state fact sheet it seen that 79% of pregnant women in West Bengal are anaemic.

b) Determinants of Safe Motherhood Index (SMHI): Binary Logit Regression

The binary logistic regression method has been fitted to identify the determinants of safe motherhood. The antenatal care, post natal care, institutional delivery and non anaemic women have been taken as components of SMHI. The determinants of these components are expected to have significant influence on the SMHI. Accordingly, logit regression has been fitted to each component.

III. Nature and trend of Reproductive Health of Women in India

Inter-state analysis has been worked out considering important factors of reproductive health. Availability of public healthcare service across the states of India and utilization of it considered as important indicators of safe motherhood.

From the factsheets of different round of DLHS (2002-04,2007-08,2012-13) data and from the Annual Health Survey (2012-13) data, the trend of sixteen major states of India is represented in Table-1. In all the three important dimensions of reproductive health services like Antenatal care (ANC), Postnatal care (PNC) and institutional delivery (Inst.deli) a rising trend is observed in the successive health surveys. In case of post natal care and institutional delivery there is a significant increase in the number of beneficiaries. There is wide interstate variation in the achievement of health services.

Reproductive health of mother in the southern states is found to be more protected compared to other regions of the country. The percentage of getting treatment within 48 hours of institutional deliveries is observed to be higher in Kerala (95.5%) it is lowest in Punjab (48.4%).

One of the interesting features of the trends of ANC3, PNC and institutional delivery is that excepting few states Bihar, Uttar Pradesh, Haryana all these three indicators are consistently good in many of the states. In many states the incidence of ANC3 is high but the incidence of PNC and institutional delivery are low and vice-versa.

Table 1
Trend of Comparative Key Indicators of Reproductive Health Services: India

State	ANC3			PNC			Inst.deliv		
	DLHS 2	DLHS 3	DLHS 4/ AHS*	DLHS 2	DLHS 3	DLHS 4/ AHS*	DLHS 2	DLHS 3	DLHS 4/ AHS*
Andhra Pradesh	86	89.4	84.3	NA	79.5	77.2	59.4	71.1	88.5
Assam*	39.4	45.2	66.2	NA	30.7	66.2	23.2	35.3	65.9
Bihar*	16.0	26.4	36.7	NA	25.6	60.9	18.8	27.7	55.4
Chhattisgarh*	44.4	51.2	65.9	NA	38.4	70.3	18.1	18.1	39.5
Haryana	43.1	51.9	44.8	NA	51.4	67.2	35.7	46.9	77
Karnataka	78.6	81.3	86.3	NA	68.4	92.4	57.9	65.1	89
Kerala	96.5	95.3	86.0	NA	99.1	95.5	97.6	99.4	99.6
Jharkhand*	30.7	30.5	60.2	NA	29.1	68.4	21.2	17.8	46.2
Madhya Pradesh*	32.3	34.2	71.7	NA	35.8	80.5	28.7	47.1	82.6
Maharashtra	92.9	91.8	77.9	NA	78.0	83.2	57.9	63.6	92
Odisha*	41.7	54.6	81.9	NA	27.4	82.8	30.8	44.3	80.8
Punjab	63.5	64.6	57.7	NA	78.7	48.4	48.9	63.6	82.7
Rajasthan	28.8	27.7	55.0	NA	37.3	79.6	30.3	45.5	78
Tamil Nadu	94.0	95.6	71.2	NA	86.3	61.1	86.2	94.1	98.9
Uttar Pradesh*	21.5	21.9	37.8	NA	32.2	77.6	21.4	24.5	56.7
West Bengal	62.7	67.0	81.3	NA	54.2	61.5	47	49.2	74.6

Source: Fact Sheet, DLHS (2012-13) & AHS* (2012-13)

IV. Reproductive Health of Woman in West Bengal

1. Demographic feature of West Bengal:

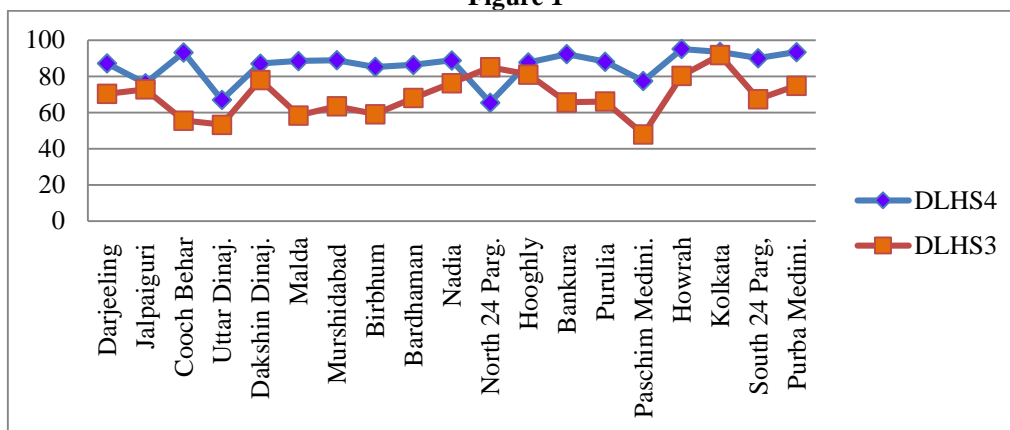
Consisting of nineteen districts, West Bengal is one of the major states in India with total population of 134 million as per 2011 census. The decadal growth rate of population during 2001-2011 Census is 13.8 percent. The overall literacy rate is 77.1 percent and 82.7 percent for males and 71.2 percent for females. DLHS -4 (2012-13) survey included 496 villages. Hindus are majority among the surveyed households and a significant share (34.5 %) of the household heads is scheduled castes (SC) and 38.4 percent of household heads are from the general castes. The sex ratio of the state is 950 females per 1000 males.

2. Index of Safe Motherhood: An Inter District Analysis

Inter-state analysis using the district level household survey of 2012-213 shows that there is a variation among the states and the position of West Bengal among the twenty eight states is 17th. Now the focus is on West Bengal. Using the same methodology, Inter-district analysis has been worked out in the state of West Bengal considering same four major dimensions, namely 'Antenatal care', 'Post-natal care', 'Institutional delivery' and 'non anaemic women'.

Percentage figures suggests that most of the districts have higher percentage value of taking three or more antenatal care visit in comparison to state value (88.3%) whereas districts like Jalpaiguri (76.2%), Uttar Dinajpur (67%), North 24 Parganas (65.5%), Paschim Medinipur (77.5%) count for less number of women taking at least three or more antenatal care visit than the state average. This factor is crucial as it indicate the actual utilization of the health care system. There is a sharp increase of taking ANC services compare to DLHS 3 except in North 24 Pargonas (Figure 1)

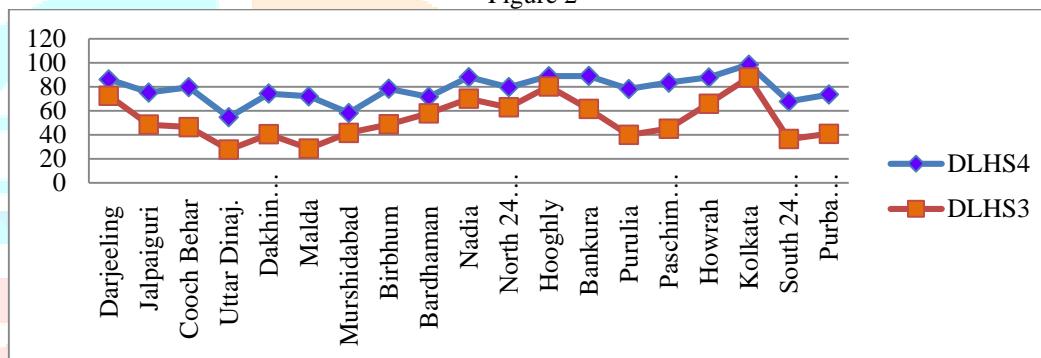
Figure 1



Trend of Three or more ANC visit

Getting treatment within 48 hours after institutional delivery is also very important for better health of mother. In West Bengal it is seen that still overall situation is not satisfactory, though most of the districts are in a better position compare to the state average specially in respect of post natal care. Birbhum (35.1%), Nadia (38.7%) and South 24 Pargonas (29.1%) are lagging behind the state average. Regarding institutional delivery Uttar Dinajpur (54.5%), Murshidabad (58.1%) bear a lower value than the state average, but compare to previous round the situation is better in West Bengal (Fig: 2).

Figure 2



Trend of Institutional Delivery

Here to construct the safe motherhood index we convert the dimension index of anaemic women into non anaemic dimension index. Data shows that prevalence of any anaemia ($\leq 11\text{gm/dl}$) of reproductive women (15yr -49yr) is comparatively high in northern region of Bengal, except Darjeeling. Study of these dimensions suggests that the performances of the districts are not homogeneous in all the indicators of safe motherhood. Thus a composite analysis based on both the indicators is desirable to provide an overall picture of the safe motherhood in the districts of West Bengal. Accordingly a composite index called Safe Motherhood Index (SMHI) has been constructed. The inter district variations of SMHI are shown in table 2. Table 2 represents the safe motherhood index, ranges from 0 to 1. The higher the value of SMHI represents better position of the district.

Table: 2
Index of Safe motherhood and its dimensions across Districts: West Bengal

Districts	D1_ANC3	D2_PNC	D3_inst_delivery	D4_Non.anemic	SMHI	Rank
Darjeeling	0.731	1.000	0.721	0.279	0.768	1
Kolkata	0.946	0.470	1.000	0.000	0.734	2
Bankura	0.902	0.709	0.785	0.215	0.711	3
Hooghly	0.747	0.532	0.783	0.217	0.682	4
Purulia	0.764	0.763	0.539	0.461	0.637	5
Howrah	1.000	0.628	0.758	0.242	0.635	6
Cooch Behar	0.936	0.755	0.573	0.427	0.632	7
Paschim Medinipur	0.404	0.719	0.662	0.338	0.534	8
Bardhaman	0.704	0.349	0.390	0.610	0.522	9
Nadia	0.788	0.185	0.765	0.235	0.487	10
Purba Medinipur	0.943	0.395	0.434	0.566	0.483	11
Malda	0.774	0.829	0.400	0.600	0.451	12
Murshidabad	0.791	0.491	0.082	0.918	0.418	13
Dakshin Dinajpur	0.727	0.511	0.452	0.548	0.413	14
North 24-Parganas	0.000	0.647	0.573	0.427	0.409	15
Birbhum	0.667	0.116	0.543	0.457	0.375	16
South 24-Parganas	0.828	0.000	0.301	0.699	0.340	17
Jalpaiguri	0.360	0.609	0.473	0.527	0.322	18
Uttar Dinajpur	0.051	0.809	0.000	1.000	0.227	19

Source: Author's calculation based on DLHS-4 district fact sheet.

Darjeeling occupies the highest ranking in SMHI with a value of 0.76. It is followed by Kolkata, Bankura, Hugli, Purulia, Howrah, and Cooch Behar which belong to the high SMHI group with SMHI values of more than 0.6. Districts, viz Paschim Medinipur, Bardhaman, Nadia, Purba Medinipur, Malda, Murshidabad, Dakshin Dinajpur and North 24 Parganas belong to the medium group of districts with SMHI values lies from 0.4 to 0.59. All the other districts have low SMHI values, lying between 0.1 and 0.3. These include the districts like Birbhum, South 24 Parganas, Jalpaiguri, and Uttar Dinajpur. Uttar Dinajpur occupies the lowest position in terms of the value of SMHI.

V. Factors affecting Safe Motherhood in West Bengal: A Binary Logit Model

The determinants of safe motherhood have been examined in terms of some indicators and those have been analysed in a binary logit model. The specification of the regression model and the hypotheses are presented in following table 3,

The following model is used to determine the factors attaching various dimensions of SMHI. Accordingly, in the first model we take first dimension of SMHI. i.e. antenatal care (ANC, 1 for received three or more antenatal care, 0 otherwise). In second model we take postnatal care as dependent variable (PNC, if received treatment within 48 hours of institutional delivery), in third model we take the third dimension i.e. Institutional delivery (1for any type of health institutional delivery, 0 other wise). Among the independent variables, we have selected caste, religion, locality, media exposure, years of schooling, work participation rate, age at marriage of the women and the financial assistance taken from the government programmes (NRHM).

The following binary regression model has been fitted to identify the factors affecting the reproductive health of mother.

$$L_i = \ln [P_i / (1-P_i)] = \alpha + \beta_1 (\text{Caste}) + \beta_2 (\text{Religion}) + \beta_3 (\text{Locality}) + \beta_4 (\text{Media_expose}) + \beta_5 (\text{Yr_schl}) + \beta_6 (\text{WPR_woman}) + \beta_7 (\text{Benefit_JSY}) + \beta_8 (\text{age_marriage}) + \epsilon_i$$

Here $[P_i / (1-P_i)]$ is simply the odds ratio in favour of receiving the facilities of ANC, PNC, Institutional delivery; the ratio of probability that a women would receive the facilities or would not.

Table: 3
Definition of dependent and independent variables

Dependent Variable	Definition
SMHI	It is a reduced variable. Therefore ANC, PNC, non-anaemic women of reproductive age, institutional delivery are reduced to one variable as Safe Motherhood Index (SMHI).
Independent Variables	Definition
Caste	There are four Social group- Schedule Caste (SC), Schedule Tribe (ST), Other Backward Caste (OBC), General (Other). We construct three dummy for SC, ST, OBC and Other is the reference category.
Religion	Here two religions are considered. We are taking Hindu and Muslim community as other sample are very low. If the respondent is from Muslim community then, Religion = 1 else 0.
Locality	If the respondent is from Urban area then Locality=1, and if from rural then, Locality = 0
Media Exposure of the woman [media_expose]	If the household have television that implies that the women is exposed to media. Here we code Media =1, if the respondent have television in home,
Year of Schooling [Yr.schl]	Label of education of the woman is measured by her year of schooling. Higher year of schooling implies higher educated women.
Work participation [WPR]	If the women did any work in last 12 month, WP=1, else 0
Financial assistance from Janani Surakhya Yojona [benefit_JSY]	If the women got JSY benefit during her pregnancy coded 1 if not then 0
Age of Marriage (woman)	Age at the time of marriage: i) ≤ 18 years, ii) 19 years to 27 years, iii) 28 years and above (Reference category).

V. Results and Discussion

Table: 4
Determinant of Different Dimension of Safe Motherhood Index

Variable	ANC		PNC		Institutional delivery	
	Coefficient (sig)	dy/dx	Coefficient (sig)	dy/dx	Coefficient (sig)	dy/dx
SC	-.209	-.015	.197**	.047	-.204*	-.022
ST	-.641***	-.058	.189	.045	-.769***	-.104
OBC	-.030	-.002	.192**	.046	-.228*	-.025
Religion	-.381***	-.03	-.036	-.008	-1.10***	-.152
Locality	-.032	-.002	.071	.017	.440***	.046
Media exposure	.016	.001	.296***	.072	.563***	.064
Year of Schooling of Woman	.090***	.006	.065***	.016	.136***	.014
Work Participation	.107	.007	.177**	.042	.319***	.036
Benefit from JSY	.595***	.04	.278***	.067	.767***	.075
Age of marriage ≤ 18	.011	.00	-.387*	-.094	-1.046**	-.106
Age of marriage ≥ 19 ≤ 27	.159	.011	-.051	-.012	-.447	-.049
Const	1.64***		-.460**		1.20**	
N	4305		4554		4554	

Source: Author's calculation from unit level data of DLHS 4 (2012-13)

*** 1% level of significance

** 5% level of significance

* 10% level of significance

Table 4 depicts the logit regression results of programme related dimensions of safe motherhood index namely; Antenatal care, Postnatal care, Institutional delivery. Here among the social category 'Other' group is the reference group. The table depicts that ANC is negatively associated with SC, ST and OBC category of households. That means larger the numbers of women are from SC, ST and OBC categories less will be the cases of taking ANC compared to 'OTHER' caste. It implies caste plays an important role in the access of health care services. STs have a negative and significant impact on taking three or more ANC. Religion (Muslim) also has a negative and significant impact on taking ANC and institutional delivery, implies Muslim mother (compared to mothers from the reference group Hindu) are less likely to avail themselves of taking antenatal care and delivery at any health institution. The marginal probabilities (statistically significant) of Muslim women are -3 point for taking ANC, and -15 point for institutional delivery compared to reference category Hindu women. In case of post natal care positive and significant result of SC and OBC population with +4 point marginal probabilities imply a good situation. It may be a positive outcome of different government schemes for the socially and economically backward class.

The positive and significant outcome of the Locality variable implies that as the women are from urban location women are more likely to take institutional delivery and vice versa. The marginal probabilities of urban women are +4 point for institutional delivery compare to rural women. This is indicative of better availability and accessibility of health care facility within urban areas.

With increasing year of schooling reflecting more scope of alternative income opportunities probability of peoples' participation is likely to increase as reflected in the significant positive value of year of schooling coefficient. Same is true for all the dimensions. Education gives awareness in every aspects of life which positively influence the reproductive status of mother. Again, it is suggested that, in case of institutional delivery, as the number of women with media exposure increases there is higher likelihood of participating in institutional delivery. The marginal probabilities of women with media exposure are +7 point for availing PNC and +6 point for institutional delivery.

Positive and significant value of work participation rate in case of postnatal care and institutional delivery implies that as the women are engaged in any occupation probability of taking postnatal care and institutional delivery increases. Engagement of women in any kind of activities except in household work keep her mind free, ensure financial independency, and they are more exposed to the outer world than the only home maker women. Though it involves physical hazards, employment has a positive effect on postnatal care as well as in motherhood index.

There are several financial assistance schemes launched by the Government for the pregnant women, one of which is Janani Suraksha Yojana under NRHM scheme to attract the poor women to come under any health institution and also to provide financial support to the expecting mothers. It has a positive impact on the entire three dimensions. Thus, Government sponsored schemes are found to have created positive impact on the availability of reproductive health care facilities.

Age of marriage is a crucial and important factor for the mental and reproductive health of the women. Early age of marriage is responsible for poor motherhood and malnourished or underweight baby. Significant and negative result implies that the women married before or at just 18 years are less likely to avail themselves the post natal care and the institutional delivery compare to higher age of marriage. Marginal probabilities of lower age of marriages (below 18) are -9 point and -10 point for post natal care and institutional delivery compare to higher age of marriage.

VI. Conclusions:

This paper has attempted to understand the trend and present status of reproductive health of woman in India with special references to West Bengal. For the analysis we construct the Safe Motherhood Index (SMHI) by the normalized inverse Euclidean distance method for the states of India and districts of West Bengal. To identify the factors responsible for safe motherhood, Binary Logit regression have been fitted separately for i) three or more Antenatal care ii) Postnatal care within 48 hours of delivery iii) Institutional delivery.

The basic findings of the study are as follows:

Firstly, there has been a significant increase in availability of health care services of post natal care and institutional delivery in India over the period of successive surveys. Composite analysis presents that empirically southern (Kerala, Karnataka, Andhra Pradesh, Tamil Nadu) and western (Goa, Maharashtra) states are better performer in availing health care facilities by mother than that other regions. In case of district level analysis of West Bengal, Darjeeling, Kolkata, Bankura, Hooghly are in a better position whereas in Birbhum, South 24 Pargonas, Jalpaiguri, Uttar Dinajpur are lagging behind.

Secondly, caste wise discrimination is still present in West Bengal. In case of SMHI intra-district variation shows social inequality, in case of institutional delivery proportion of ST women are very low compared to other castes.

Thirdly, the result of the empirical study shows that the proportion of utilisation of maternal health care services is less (except PNC for SCs) among the women of socially backward and minority group than the women of upper caste group. This may be due to the social structure of exclusion or lack of awareness among them. Government, sponsored schemes are found to have succeeded to create positive impact on the availability to the weaker section of the society.

Fourthly, place of residence of the household and year of schooling, age of marriage of the women are found to be positively related to the utilisation of maternal health care services. The binary logit model shows that women's media exposure has a significant impact on maternal health care services. Exposure leads to higher awareness about the importance of health care than the women who are less exposed.

Fifthly, the benefit of Janany Surakshya Yojana (JSY) has a positive impact on the utilisation of maternal health care services.

The status of reproductive health of mother is improving over time in West Bengal, but the rate of progress is not satisfactory. Still there are caste and religious variation of the use of reproductive health care services. Economic empowerment of the women, social participation, creation of awareness, media exposure and the government sponsored schemes are expected to have a significant impact on reproductive health of mother near future. Still special attention is needed to improve the situation of under privileged and the women living in hardship.

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