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Obstetric Morbidity and Health Seeking Behaviour among the Currently-Married Women in West Bengal, India

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ABSTRACT

Obstetric morbidity and maternal death are a matter of great concern in developing countries especially in India. Even after two decades of the safe motherhood campaign, India is contributing the highest percentage (19 percent) of maternal deaths in the world followed by Nigeria (14 percent) (WHO, 2012). Most of these deaths are largely due to pregnancy, delivery and other post-delivery complications which can be prevented through simple institutional interventions. According to the third DLHS report (2007-08), in India, eastern states including Bihar, West Bengal and Jharkhand accounts for the highest prevalence of obstetric morbidity. In West Bengal, 72.4 percent women experienced complications during pregnancy. Further, there are wide socio-economic variations in morbidity patterns and treatment seeking behaviour among women. This paper will try to determine the socio-economic intersectionality behind obstetric morbidity and treatment seeking behaviour among the currently married women (aged 15-49 years) across different districts of West Bengal. In addition, different factors related to differential access to maternal healthcare services and its utilisation will also be examined with reference to the central issue. Binary logistic regression method has been applied to see the effects of various socio-economic factors contributing to obstetric morbidity and treatment-seeking behaviour. Wealth of the household, women's age and level of education, early use of antenatal care services and delivery in a medical setting are found to be significant in this case.

1. Background of the Study

Obstetric morbidity and maternal death are a matter of great concern in developing countries especially in India. In an estimate, the World Health Organisation (WHO) has shown that globally 287000 maternal deaths occurred in 2010, although there is a substantial decline of 47 percent from the levels of 1990. It has been seen Sub-Saharan Africa (56 percent), and Southern Asia (29 percent) jointly encountered 85 percent of the total maternal death (245000). At the country level, even after two decades of the safe motherhood campaign, India is contributing the highest percentage (19 percent) of maternal deaths in the world followed by Nigeria (14 percent) where the number of deaths accounted as 40000 (WHO, 2012). Moreover, the MMR in developing regions (240 per lakh) is 15 times higher than the developed region (16 per lakh). Most of these deaths are occurring due to pregnancy-related causes worldwide and can be prevented or avoided if simple actions are taken which are proven to be effective and affordable (Khan et al.,2006 as in Raven, Tolhurst, Tang, & van den Broek, 2012). Attendance of timely antenatal care, proper vaccination, delivery in a medical setting, and skilled health workers are some of the best possible ways to avert these death tolls (Say & Raine, 2007). However, factors like rural-urban locality, socio-economic conditions, women's level of empowerment, gender inequality have also contributed many reasons for maternal mortality.

Maternal health embraces the range of services, which started from birth preparedness in all forms of antenatal care, intra-natal and post-natal care to achieve the healthy birth outcome and good health of mothers at the end of their pregnancy (Bhandari, 2012). Safe motherhood programme has been a national priority programme in India since the Reproductive Child Health Programme (RCH) during the 1990s. It has been revised and formed the basis of recent initiatives like Janani and Sishu Suraksha Yojana (JSY) in NRHM during the recent years and also gained international support from UNDP to improve maternal health in India with Millennium Development Goal 5 (Antenatal care & birth attended by skilled health personnel). As a result of these programmes, substantial coverage has been achieved across the country in very recent years. NRHM strengthened the structures of the rural health care system in India in the recent decades targeting at different levels of health care services (i.e. at primary, secondary or at tertiary level) at different scales. Moreover, the active engagements of health workers (like ANM, ASHA and other health workers) with the community have changed the scenario at the grassroots level. There are also some schemes like Janani and Sishu Suraksha Yojana and Matriyaan Facilities under which safe delivery incentives and free transport facilities were provided to specific sections of society. But in spite of having such target mechanisms the situation of maternal health in the country is not well. National survey reports of NFHS, DLHS and their consecutive rounds are also revealing the same findings of the low level of maternal health in the country during the last years. SRS reports have shown that EAG states (which include earlier BIMARU states) have the worst situation as compared to other parts of the country. According to NFHS IV (2015-16) report, 53.6 percent of the pregnant women (15-49 years) in the West Bengal are anaemic (which was 62.6 percent in 2005-06 NFHS III) which signifies low levels maternal health in the area and not very different for the whole country (Mavalankar et al., 2009, 2011). According to the third DLHS report (2007-08), in India, eastern states including Bihar, West

Bengal and Jharkhand accounts for the highest prevalence of obstetric morbidity. According to recent DLHS-IV (2012-13) report, 46.0 percent (which was 72.4 percent in DLHS-III, 2007-08) women in West Bengal experienced complications during pregnancy. Further, there are wide socio-economic variations in morbidity patterns and treatment seeking behaviour among women.

In the case of safe and institutional delivery (according to DLHS-III report), less than 50 percent women in country delivered in a medical setting and merely half of the women have delivered in safe hands by health personnel. In the case of maternal complications, India has quite a high rate of pregnancy, delivery and post-delivery complications among the women. Delivery complications are a major contributing factor in maternal death in India. In India, above sixty percent women have experienced delivery complications like haemorrhage, sepsis, obstructed labour, etc. The highest rate is found in Bihar, followed by West Bengal and Sikkim where more than seventy percent of ever-married women have experienced pregnancy-related health problems. Hilly tribal states and north-eastern states have a higher rate of delivery complications. In the case of post-delivery complications Bihar, Uttar Pradesh, Assam, West Bengal, and Sikkim has higher rates of post-delivery complications than the other states (Table: 1 in appendix). The fact also evidenced from the SRS reports that main reason for maternal death is haemorrhage (38 percent) in 2003 followed by other factors like obstructed labour, sepsis and other reasons (Sample Registration System, 2006). Studies have identified various causes of obstetric morbidity including poor socio-economic factors, poor healthcare structures. Centre for Reproductive Rights (2008) mentioned about the “three delays” of delay of seeking care, delay in reaching the health facility and the institutional delay in giving the quality of care during treatment. Although the above factors are interrelated, the first delay that is the delay in deciding to seek care will occur due to ‘inadequate resources, poor access to high quality health care and lack of awareness at the household level of the importance of maternal health care’ (CRR,2008; pp. 20). It reveals that in areas of West Bengal and Orissa 20-25 percent maternal deaths occur because they never sought health care at all because of the perception that illness is normal during their obstetrics period; which is also repeated by empirical sources which show that in these two states burden of complications are more than other states. The second delay can happen because of lack of access to obstetric care and socio-economic and physical inaccessibility to a health facility. The third delay will occur from the untimely diagnosis, negligence in treatment, poor skills and untrained care providers, unnecessarily long waiting time, shortage of equipment and other lifesaving facilities, poor referral system and a shortage of basic facilities like toilet, electricity and water supply. Thus, the main focus of this study is to discuss the health of women in West Bengal and its’ relationship with other factors.

2. Objectives

The primary objectives of this paper are as follows-

I. To explore the socio-economic intersectionality behind obstetric morbidity among different districts of West Bengal.

II. To show the treatment-seeking behaviour among the currently married women (aged 15-49 years) across different districts of West Bengal.

III. To reveal the different factors related to differential access to maternal healthcare services and its utilisation.

3. Study Area

The study area chosen for the present research is the state of West Bengal. West Bengal has a unique geographical location and has vast inter-district diversity geographically, culturally and socio-economically. According to the Census of India 2011, it is the fourth largest state regarding population and three-quarter of which lives in rural areas continued to persist be a moderate ranker regarding health indicators. Its ranked fifth in IMR (32) and MMR (117), fourth in Birth rate (16.3), Neo-Natal Mortality (23) and under-five mortality (37). However, inter-district figure varies considerably over the state in terms of this indicators. It has a literacy rate of 77.08 percent with a population of 91.3 million in 2011. It comprises of 72.47 percent of Hindu, 25.25 percent of Muslim and 2.28 percent of other religious community with 23.02 percent of Scheduled Caste and 5.05 percent of Scheduled Tribes population. The decadal growth rate is lower as compared to other state and national average. Most of the people in rural Bengal are engaged with agricultural work, but the urban and semi-urban parts are most diverse in work culture.

4. Data Sources and Methodology

4.1. Data sources

The study is based on mainly secondary data. Data have been taken from third-round District Level Household and Facility Survey (DLHS) conducted in 2007-08. The survey was conducted among the ever-married women of the age group of 15-49 over all the states of India in that period. In addition to this different published and unpublished literature, various state and national level health survey reports, Human Development Reports (HDR) have been reviewed to understand and present the past and present condition of Maternal and child health services in West Bengal. Different National Family Health Survey (NFHS I- IV) reports, DLHS Reports, Indian Human Development Reports etc. have been used, because the comparison between different time frame provides insight into changes and effectiveness of the various programmes over time (Iyengar, Iyengar, & Gupta, 2009). In addition, recorded field observations are also included in the discussions whenever felt necessary.

4.2. Methodology

Different Methodologies have been used to serve the purpose of the objective and hypotheses of the study. Apart from using bivariate tables, the other methods used here as follows-

For exploring the regional dimensions, the following have been done-

I. NSSO regional divisions were used to see the regional variations in MCH service utilisation. The details are given separately. (Table: 2 in appendix)

II. Another regional division has been created based on 'DFID-Funded Health System Development Initiative (HSDI)' programme (2005) where Government of WB made special health sector strategy for some districts of West Bengal to promote utilization of quality health services to achieve MDGs (GoWB & DFID, UK, 2005; DoHFW, GoWB, 2009). This programme was meant to reduce IMR, MMR in the selected districts. So, an attempt has been made to review the situation of MCH care services in these districts as a whole. The 'HSDI Districts' includes Malda, Murshidabad, Purulia, Cooch Behar (Koch Bihar), Dakshin Dinajpur, and Uttar Dinajpur. The rest of the other districts were clubbed into 'Non-HSDI Districts'.

III. Place of residence is a locational advantage or disadvantage for those who reside in urban and rural areas respectively; so, it has been used as a spatial category which is equally used as a social background in other studies.

IV. Binary Logistic Regression procedures have been used to evaluate the effect of selected categorical explanatory variables [Demographic, Socio-Economic and regional factors like Age, Birth order, Caste, Religion, Wealth index, Educational levels, place of Residence, regions etc.] to identify the major determining factors of utilization of Maternal and Child Health services across West Bengal. Logistic Regression is an appropriate statistical technique because the dependent variable is dichotomous (DeMaris, 1993, 1995). The Logistic regression model for the log odds of MHC and CHC utilization is-

$$Ln\ [pi/1-pi] = a + \beta X1 + \beta 2X2 \ldots$$

Where *[pi/1-pi]* simply the conditional odds of using different health services, α is the Y-intercept, X_1, X2 ... represents the explanatory variables used in the equation, β1, β2 ... represents regression coefficients, the effect parameter associated with the explanatory variables.

5. Result and Discussion

5.1. Trends of Maternal Mortality in West Bengal (1982-2012)

West Bengal is the fourth largest state in India with a total population of 91.2 million (Census 2011), three-quarters of which lives in rural areas. In almost all the demographic and health indicators, it is a better performer than the national average (Table: 3 in appendix) and holds a moderate to high rank in all indicators among the states. West Bengal's maternal mortality ratio of 117 in 2010-12 (SRS; Dec 2013) is promising progress towards achieving MDG 5 in the year 2015. There is a sharp decline in MMR in between 1998 and 2004, but MMR again increases in the 2007 and hereafter decreased very sharply to 117 in 2012 (Table: 4.1). The progress in MMR surely attributed by the implementation of NRHM programme, which helps to improve access to healthcare services recently. But in spite of having good progress in maternal mortality, there is widespread anomaly in other MCH health indicators, and socio-spatial inequality in these indicators persists in West Bengal. According to SRS report, the leading causes of maternal mortality in Bengal and other states are haemorrhage (40 percent), sepsis (10 percent), hypertensive disorders and obstructed labour (10 percent) and other conditions like abortion, anaemia and indirect causes (40 percent) (Table: 4.2 in appendix).

Table. 4.1: Trends of MMR in India and West Bengal (1982-2012)

Source and Year	West Bengal	India
Bhat*(1982-86)	709	580
Bhat *(1994)	636	544
IIHF^ (199899)	451	466
SRS (1997-98)[1]	303	398
SRS (1999-01)[1]	218	327
SRS (2001-03)[1]	194	301
SRS (2004-06)[2]	141	254
SRS (2007-09)[2]	145	212
SRS (2010-12)[2]	117	178

*Source: Compiled from different sources as mentioned above; * Regional Estimates covering more than one state-based on rural households; ^ Estimates of MMR from a regression model based on the NFHS 2 data, IIHFW-Indian Institute of Health and Family Welfare, Hyderabad (all taken from Vora et al., 2009); MMR =Maternal Mortality Ratio, NFHS=National Family Heath Survey SRS=Sample Registration System, [1]SRS Report, (2006) [2] SRS Bulletins.*

5.2. Utilization of Maternal Health Services in West Bengal (1992-2012)

In respect to overall performance of maternal health indicators West Bengal is in a better position than national and other state averages (Table: 5). According to NFHS 1 survey report, only half of the total women in West Bengal had gone for three ANC visits. In the NFHS 3rd Survey, 2004-05, the percentage of total women increased to 62.4 percent, showing an increase of 12.4 points. The 3rd round survey of DLHS conducted in 2007-08 showed a marginal increase to 67 percent, which according to CES, UNICEF survey in 2009 showed a further increase to 83.2 percent. Very recently, DLHS 4 (2012-13) fact sheet showing further 5-point increase (88 percent). Thus, after implementation of NRHM in 2005 (NFHS 3) there is an increase of 26 points until now to 2012 (DLHS4). In case of full ANC there is an increase of 25 points during the seven years after NRHM which signifying the huge progress happen mainly due to NRHM.

In case of institutional delivery, in 1993-94 only one third women had gone for institutional delivery whereas in 2005 it rose to 43.1 percent and by 2007-08 only half of them had gone for institutional birth but by 2009 it had gone up to almost 70 percent. According to recent DLHS 4 Survey, it goes up to 74.6 percent in 2012-13. In case of skilled birth assistance at the time of delivery, in NFHS I (1993-1994), it has been seen that one third of the delivery in west Bengal was done by skilled birth assistant. It rose to nearly half by 2005 (45.7 in NFHS 3rd survey) and crossed the half point in 2007-08 (51.6 in DLHS 3rd round survey) and increased to 82.4 percent in 2012 but still almost 20 percent of the women's delivery is in insecure hands.

Table:5, Performance indicators (in percentage) for maternal health services in West Bengal (1992-2012)

Indicators		NFHS 1 1992-93	NFHS 2 1998-99	DLHS 2002-04	NFHS3 2004-05	DLHS 3 2007-08	CES^ 2009	DLHS 4♣ (2012-13)
Ante-natal Care	Mothers who had ANC check-up in 1st trimester	24**	35.1	42.4	39.0	40.5	59.2*	65.1
	Completed 3 ANC care visits	50.3	57.4	64.6	62.4	67.0	83.2	88.3
	Tetanus Toxoid Injection (2 or more)	70.4	82.4	86.2	90.9	90.6	94.6	98.1#
	Received IFA tablets	-	-	18.9	24.3	22.4	38.5	44.0
	Mothers Who had Full ANC check-up	-	-	14.4	-	19.2	17.4	39.1
Delivery	Institutional Delivery	32	40.1	47.0	43.1	49.2	69.5	74.6
	Births assisted by doctor/ nurse /LHV/ANM/other health personnel	33.9	44.2	54.8	45.7	51.6	72.6	82.4
Morbidity	Women whose BMI in below normal	-	43.7	-	37.7	-	-	-
	Ever-married women age 15-49 who are Anaemic	-	62.7	-	63.8	-	-	76.3
	Pregnant women age 15-49 who are Anaemic	-	56.9	-	62.6	-	-	79.2

*Source: Compiled from different sources as mentioned above, ANM=Auxiliary Nurse Midwife; LHV=Lady Health Visitor; NFHS=National Family Health Survey; BMI= Body Mass Index; DLHS= District Level Household &Facility Survey; ^ Coverage Evaluation Survey (2009), UNICEF; **Percentage of women who delivered during 12 months before survey; *All India average; ♣ DLHS 4 (2012-13) District and State Fact Sheet accessed from https://nrhm-mis.nic.in/*

Tetanus Toxoid injection is almost universal among the women but there is still above 55 percent of mothers who have not taken IFA tablet during pregnancy.

While going through morbidity prevalence data given by NFHS 3 round, it has been seen that among the pregnant women (15-49 age group) 62.6 percent are anaemic, which is similar in case of ever-married (15-49 age group) women. According to recent DLHS 4 Survey report, the level of anaemia has increased to 76.3 percent (by 12.5 point) among ever-married (15-49 aged) women and increased to 79.2 percent (by 17 percent) among the pregnant women (15-49 aged). It can be seen that prevalence rate during eight years of survey interval from NFHS 3 (2004-05) to DLHS 4 (2012-13) has increased in an alarming rate. There are also more than one third of women (37.7) who has BMI below normal in 2005. IFA consumption can make some changes in anaemic prevalence rate, but the low uses of IFA uses have worsened the situation. Thus, very low rate of change has been experienced up to 2005-06, but the rate of increase is higher in recent years (especially from 2005-06 to 2012) in the state; although percentage of women receiving full ANC care remains below a 40 percent (DLHS 4). It has been felt that implementation of NRHM in the state has increased the rate of development in health indicators and can be seen in recent survey data by UNICEF and DLHS 4. But the level of full ANC, consumption of IFA tablets, ANC at first trimester and level of institutional delivery remains low. Further, the level of morbidity among the women is very high in the state.

5.3. Obstetric Morbidity and Its Determinants

In West Bengal 72 percent women have experienced pregnancy complication (DLHS-3); but the percentage of women who have experienced delivery complication is higher (73.6 percent) and women who have gone through any type of post-delivery complication is 46.3 percent of the total women in the age group of 15-49 years who had still/live birth during the last three years preceding the survey. It is evident that those 'women who either do not receive ANC or have received an incomplete course of ANC exposed to risk of maternal death' (IIPS, 2010a). In case of West Bengal which is very true. Here as the rate of ANC check-up is low, more women are suffering from complications (Table: 8).

5.3.1. Complications during pregnancy period

Night blindness, blurred vision, convulsions, swelling of legs and body, excessive fatigue, anaemia, or vaginal bleeding are the various problem a woman may face during her pregnancy. It can be seen (Table: 6 in appendix) that adolescent and old age women were more prone to any type of pregnancy complication. Similarly, birth order has same effect on complications. Complications among the illiterate mothers, lower caste women (62 percent among ST than 74 percent among others) are less than the higher educated women, which may be due to their different perceptions about any illness or less reporting of such symptoms (Mukhopadhyay, 2004). Wealth of family has less impact on complication than individual demographic factors.

5.3.2. Complications during delivery

It has been noted that almost 50 percent maternal death occurring in India especially in the state of West Bengal are due to delivery complications like haemorrhage, obstructed labour, hypertensive disorders during delivery. This can be evidenced from the above findings, that 73 percent of pregnant women experience delivery complications during their confinement. It is found from data (Table: 6) that adolescent mothers are most vulnerable and exposed to delivery complications, (as 77 percent of 15-19 age groups have experienced delivery

complication compared to 67 percent of 35+ age group) which is generally decreases in the higher age groups. Birth order has also had a similar effect on delivery complications. Education seems to have positive effect on delivery complication because with increasing level of education delivery complication decreases. Caste is an important factor as STs and SCs are slightly more affected by delivery complication than other higher castes. Religion, wealth of family, possession to BPL and working status of women found to be insignificant in this case.

5.3.3. Post-delivery complications

High fever, lower abdominal pain, foul smelling vaginal discharge, excessive bleeding etc. are the complications most mothers faces during the post delivery period of their pregnancy. Less than 50 percent of women in West Bengal had experienced such kind of problems. Mothers in India mostly reported to have massive vaginal bleeding and a very high fever in the post-partum period (IIPS, 2000).

It has been observed (Table: 6) that older age mothers are mostly affected by post-delivery complication as compared to adolescent mothers. This situation is opposite of delivery complication. In case of birth order similar effects of age has been found. Education is negatively correlated with post-delivery complication as when educational level increases, post-delivery problems decreases by almost 20 percent. Similar effect has been found in case of wealth of the family, as wealth of the family increases post-delivery complication decreases. BPL mothers and working mothers also faced more post-delivery complication when compared to non-BPL, non-working mothers.

5.4. Obstetric Morbidity and Health Seeking Behaviour- A Spatial Scenario

In West Bengal three fourth of the women have experienced pregnancy or delivery complications (Table: 7). The main cause of pregnancy complication as said earlier during delivery in West Bengal is obstructed labour (73.2 percent), premature labour (43.2 percent) and prolonged labour (38.9 percent) (IIPS, 2010a). Reporting of pregnancy complication is highest in Paschim Medinipur district (79.1 percent) followed by South 24 Parganas (77.9 percent), and the lowest is in Dakshin Dinajpur (62.5 percent), followed by Purulia (66.2 percent). Delivery complication varies from 57 percent in Nadia to highest in Birbhum (88.1 percent) followed by Paschim Medinipur (85 percent) and Purba Medinipur (82 percent). Treatment of pregnancy problem is lowest in Koch Bihar followed by Maldah and Murshidabad district. Reporting of complications is higher in rural areas than in urban areas. Reporting is also high among the women in Non-HSDI districts. NSSO Region wise southern plain has the highest prevalence of pregnancy complication whereas central and western plains mothers have experienced more delivery complication.

In case of post-delivery complication, the major type of post-delivery complication in West Bengal is lower abdominal pain (62.5 percent), followed by other problems (53.6 percent) and high fever (43.1 percent) (IIPS, 2010a). Post Delivery complication is highest in Murshidabad (61.9 percent) followed by Koch Bihar (59.1 percent) and Uttar Dinajpur (57.3 percent) and lowest in Bankura (32.4 percent), followed by Hugli (33.5 percent). Almost half of the women in West Bengal who have post-delivery complication have sought problems. 71.9 percent women in Haora have gone for treatment in post-delivery problems.

5.5. Determinants of Obstetric Morbidity and Health Seeking Behaviour

Problem of pregnancy and post-delivery complications are different for different mothers, mostly depending on mother's age group; mothers in the adolescent and older age group are more prone to problems than others. More over several factors are associated to increase or decrease the likelihood of pregnancy, delivery and post-delivery complication. Due to high susceptibility to these problems, adolescent and old age women are keen to go for treatment for these cases. Those who are giving birth for the first time (i.e. 1st order) as compared to them who are going for the last child (4th order birth) have gone for treatment more often. Literacy seems to have important effect on health or treatment seeking behaviour and thus mothers who are more educated than others are more willing to go for treatment. Caste has negative effect on treatment seeking for problems, as the mothers from lower caste groups are less likely to go for check-up than the upper caste mothers. Muslim mothers are going for more post-delivery check-ups than others as they are more susceptible to these problems. Mothers from wealthy family who are non-BPL educated and of higher social status go for treatment more regularly than others. Place of residence or accessibility of the region is also very important in this case. It is found during the field survey that in less accessible areas of Goalpokhar I Block in Uttar Dinajpur, the referral communication is very poor and ASHAs do not have the telephone number or any contact number of the referral hospital or ambulance van. Besides ANM of the village Sub Centre resides outside the village and could not help them at emergency time. Family members are helpless and could not manage the transport/ambulance to send the patient to Lodhan hospital for treatment due to unavailability of proper transport facilities and have to go to local quake doctors or rural practitioner. Moreover, the rural women are also reluctant to go to the doctors for this kind of problems because of the privacy issues.

5.6. Antenatal Care as the Determinant of Obstetric Morbidity

There are several interrelated factors, which determine the magnitude of complications and type of delivery taken place. Women who receive ante natal care check-ups are more likely than other women to go for institutional delivery because at the time of birth they receive the advice for that. Another aspect is that women with less ANC check-ups and non-institutional delivery are more prone to health problems and complications (IIPS, 2000). Their knowledge about different health related issues were also going to increase with more ANC visits. In the (Table: 8 in appendix) it can clearly visible that, those who gone for more ANC check-ups and full ANC check-ups have less suffered from any delivery or post-delivery complications.

Table: 9, Results of logistic regression (odds ratios) for effect of socio-economic and regional factors for obstetric morbidity & health seeking behaviour

Determinant Factors	Safe delivery 0=no, 1=yes	Home delivery due to family matters 0=no, 1=yes	Any pregnancy complication 0=no, 1=yes	Any delivery complication 0=no, 1=yes	Any post-delivery complication 0=no, 1=yes	Sought treatment for pregnancy complication 2=no, 1=yes	Sought treatment for post-delivery complication 2=no, 1=yes
Age of Respondent mother (Ref: 25-29 year)							
15-19	1.228	0.771	**1.424****	**1.348***	1.158	1.065	1.662**
20-24	1.179*	0.85	**1.212***	**1.233***	1.032	0.909	1.164
30-34	0.89	1.28	1.089	0.903	1.038	0.916	0.934
35+	0.54**	1.991**	1.259	0.811	1.368	1.224	0.762
Birth Order (Ref: Fourth Order)							
First Order	**7.1****	0.191**	1.156	**1.39****	0.548**	0.478**	**1.409****
Second Order	2.772**	0.399**	0.87	1.084	0.618**	0.729**	1.317
Third Order	1.633**	0.626**	0.879	1.15	0.701**	0.837	1.23
Mothers Level of Education (Ref: Illiterate)							
< 5 years	1.585**	0.716**	**1.264***	1.222	0.936	0.793*	1.094
5-9 years	3.457**	0.426**	**1.198***	1.19	0.781**	0.411**	0.853
10 or More	**16.257****	0.113**	1.133	**0.755***	**0.48****	**0.205****	**0.495****
Mothers Working Status (Ref: Non-working)							
Working	0.46**	1.73**	0.964	0.955	1.103	1.338**	0.973
Family Wealth Quintile (Ref: Poorest)							
Second	1.43**	0.826*	1.236*	0.852	1.029	0.798*	0.857
Third	2.117**	0.656**	1.054	0.924	0.821*	0.644**	0.718*
Fourth	**6.87****	0.262**	1.092	1.001	0.629**	**0.308****	0.757
Richest	**37.342****	0.062**	0.991	**0.597****	**0.452****	**0.189****	0.357**
Possession of BPL (Ref: BPL)							
Non-BPL	1.576**	0.725**	0.933	0.924	**0.806****	**0.737****	0.93
Caste (Ref: ST)							
SC	1.948**	0.58**	**1.476****	0.821	1.134	0.698*	0.803
OBC	4.285**	0.287**	1.383	0.705	0.822	0.601**	0.888
Other	2.076**	0.758*	**1.796****	0.744	**1.341***	**0.566****	**0.591****
Religion (Ref: Hindu)							
Muslim	0.388**	2.817**	**1.468****	0.995	**2.092****	1.189*	0.732**
Others	0.466*	2.334**	0.624	0.878	0.82	2.059	1.754
Place of Residence/Locality (Ref: Rural)							
Urban	**5.47****	0.257**	1.176	0.925	**0.715****	0.455**	0.655**
NSSO Regions (Ref: Eastern Plains)							
Himalayan Region	1.703**	0.614**	1.053	1.11	0.814	1.086	1.145
Southern plains	1.79**	0.667**	1.334*	0.898	0.682**	0.69**	1.071
Central Plains	3.332**	0.356**	1.076	1.21	0.598**	0.777	0.958
Western Plains	1.468**	0.567**	1.005	1.445**	0.563**	0.907	1.132
HSDI Focus District (Ref: HSDI District)							
Non-HSDI District	2.258**	0.487**	1.055	1.251**	0.631**	0.786**	1.146

*Source: Computed from DLHS 3 Data sets. * indicates significance level of 0.05*

Mothers who have received three or more ANC check-ups have gone more for treatment of pregnancy problems. The mothers with full ANC are more willing to go to health centre for treatment for their pregnancy problems (81.9 percent) and post-

delivery complications (63.1 percent). In addition, mothers who have received 3 or more ANC check-ups or full ANC are those who have gone more for delivery under health personnel (70.6 percent) and institutional delivery.

Mothers' knowledge about danger signs of new born, pneumonia, and diarrhoea have also increased by more ANC check-ups and for mothers completing their full ANC. The month during which they received their first check-up is also an important factor because mothers who received ANC at first month has less pregnancy problems (78.8 percent). The mothers who have gone for treatment of pregnancy problems regularly (84.4 percent), they have also less delivery complication. 83.5 percent mothers who have gone for ANC at first month are those who have delivered under health personnel and they have less post-delivery complication as they have gone for their treatment very early. They also have significantly higher knowledge of danger signs of new born, pneumonia, and diarrhoea.

6. Conclusion

So, it has been found that obstetric morbidity and treatment seeking behaviour is interrelated with various factors. Maternal morbidity is significantly affected by various antenatal care initiatives and safe delivery practices. Moreover, various demographic factors like age of the mothers, birth order of the child, education and wealth of the family is very important actor for both the occurrence of maternal morbidity and treatment seeking behaviour (Table: 9).

In case of health complications, adolescent age mothers are more prone to complications as compared to other groups. Thus, it has been observed that, women who are of adolescent and of young age group and at the same time has delivered their first child, have experienced more complications during their pregnancy, delivery and post delivery period as compared to other groups.

In case of safe delivery, in case of their first order childbirth women are 7 times more likely to go for safe delivery than the fourth order childbirth. Opposite result is found in case of home delivery due to family judgement i.e. women with higher order birth and higher aged are more likely to deliver in home due to family judgement as compared to the younger ones and those who deliver for the first time. In case of pregnancy, delivery and post-delivery complications, mothers who are of younger age have experienced more complications. At the same time, they are the ones, who are also going for more treatment as compared to others.

In case of safe delivery, women with 10 or more years of education are 16 times more likely to go for safe delivery and the women who are from richest family are 37 times more likely to go for safe delivery, therefore the chances of morbidity are also reduced for educated mothers. Home delivery due to family judgement is low among the educated and riches. In case of health complications there is no such difference, but complications are slightly more among educated and riches which may be because of their health consciousness and more reporting of illness. Mothers antenatal care has significant relation with mothers' medical care seeking behaviour because who has done ANC properly, are going more for medical treatment for any complications at pregnancy, delivery and post-delivery complications. Therefore, proper ANC has its impact on medical treatment seeking behaviour and treatment practices. Antenatal care also has negative correlation with mother's health complication which intends that antenatal care has its impact on health of mothers and children. Thus, with increasing rate of ANC health of the mothers and their children are destined to be better.

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Appendix

Table: 1, Some Aspects of Maternal Health Care Services in States of India, (DLHS 2007-08)

States/UTs	Percentage of currently married Women (Aged 15-49 years) Having							
	ANC at first trimester	At least 3 ANC taken	Full Antenatal Check-ups	Institutional Delivery	Safe Delivery	Pregnancy complications	Delivery complications	Post Delivery complications
Andaman & Nicobar Islands	48.2	79.5	48.6	76.4	77.4	55.0	38.4	22.9
Andhra Pradesh	67.3	89.4	40.5	71.8	75.6	42.4	45.0	25.0
Arunachal Pradesh	36	46.3	5.4	47.6	48.8	29.7	46.5	16.4
Assam	39.1	45	8.5	35.1	39.9	60.2	67.8	42.8
Bihar	24.1	26.3	4.6	27.5	31.7	75.7	81.3	57.4
Chandigarh	71.2	77.6	30.2	76.1	81.0	42.9	49.3	18.0
Chhattisgarh	38.5	51.1	13.7	18.0	29.6	43.7	46.7	21.6
Dadra & Nagar Haveli	54	63.2	23	44.0	45.4	59.1	45.6	29.5
Daman & Diu	82.5	87.4	43.4	64.1	69.2	55.1	44.0	21.2
Delhi	57.7	71.7	33.6	68.7	71.6	66.3	69.1	27.1
Goa	89.6	95.8	90.9	96.4	96.6	64.3	35.3	26.8
Gujarat	52.3	54.8	19.9	56.4	61.6	47.9	47.3	25.6
Haryana	55	51.8	13.2	46.8	53.2	56.5	55.8	28.3
Himachal Pradesh	62.1	59.4	31.4	48.3	50.9	54.8	74.0	32.9
Jammu & Kashmir	56.6	73.3	29.1	54.9	58.6	59.5	53.8	45.0
Jharkhand	30.8	30.5	9	17.7	24.9	67.5	84.0	47.2
Karnataka	71.9	81.2	51	65.1	71.6	50.1	43.7	28.6
Kerala	95.6	95.2	72.2	99.4	99.4	63.6	24.0	21.5
Lakshadweep	78.1	91.4	68.2	90.7	95.7	50.1	19.1	16.8
Madhya Pradesh	33.7	34	8.6	46.9	49.9	61.3	66.5	41.4
Maharashtra	61.6	74.4	33.9	63.5	69.2	58.2	65.0	38.7
Manipur	56.9	57.2	12.3	41.0	55.3	33.5	25.6	18.8
Meghalaya	24.6	39.5	14.4	24.5	28.9	44.8	37.9	23.7
Mizoram	43.9	62.4	32.9	55.7	63.3	43.9	19.6	23.9
Orissa	47.5	54.5	23.3	44.1	50.8	59.6	68.5	33.4
Puducherry	74.7	87.8	48.6	99.0	99.2	51.4	34.4	16.5
Punjab	62.9	64.6	14.3	63.1	76.9	46.4	54.4	21.4
Rajasthan	32.7	27.6	6.6	45.4	52.6	57.4	66.8	29.6
Sikkim	49	69.8	27.4	49.5	56.0	71.8	73.2	47.4
Tamil Nadu	76.8	95.6	51.8	94.0	95.5	47.8	37.6	18.8
Tripura	39.6	43.9	13.2	46.2	47.2	53.6	72.1	28.1
Uttar Pradesh	25	21.8	3.3	24.5	30.0	63.9	66.1	48.2
Uttarakhand	33.6	32.2	15.6	30.0	35.2	60.8	71.2	42.8
West Bengal	42.5	66.9	19.6	49.1	51.6	72.4	73.2	45.9
India (15-49)	**44.9**	**49.7**	**18.8**	**46.9**	**52.3**	**58.8**	**61.2**	**36.8**

Source: DLHS 3 round 2007-08 National Report, MoHFW, GoI.

Table: 2. NSSO Regional Division of West Bengal

State	Regions	Details Composition of the Districts
West Bengal (19)	Himalayan Region	Darjeeling, Jalpaiguri, Koch Bihar
	Eastern Plains	Uttar Dinajpur, Dakshin Dinajpur, Maldah, Murshidabad, Birbhum, Nadia

	Southern Plains	North 24-Parganas, Kolkata, South 24-Parganas
	Central Plains	Barddhaman, Hugli, Howrah
	Western Plains	Bankura, Purulia, Medinipur
Source: Retrieved from: http://mospi.nic.in/mospi_new/upload/nsso/nss_regions		

Table: 3. Demographic and health indicators of West Bengal and India: 2011

Indicator		West Bengal	India
Population (million) (2011)		91.2	1210.5
Decadal growth rate (2001-2011)		13.93	17.64
Population density/per km (2011)		1028	382
Crude Birth rate (2011) *		16.3	21.8
Crude Death rate (2011) *		6.2	7.1
Total fertility rate (2010)		1.8	2.5
Age (years) of effective marriage (2005) Females		20.3	21.0
Literacy rate: total (Census of India, 2011)		76.26	74.04
	Male	82.67	82.14
	Female	71.16	65.46
Sex ratio (no. of females per 1,000 males)		950	943
Life expectancy at birth-Female		72.1	69.6
Infant mortality rate (2011) *		32	44
Child mortality rate (2011) *		6.2	7.1
Under Five Mortality, 0-4 years (2009) *		40	64
Maternal mortality ratio (2011) *		117	178
*Source: Health on March (2011-12), State Bureau of Health Intelligence, Govt. of WB; *SRS estimation.*			

Table. 4.2: Causes of Maternal Deaths from 2001-03 Special Survey of Deaths

Maternal Causes	India		West Bengal & Others*	
	In %	95 % CI	In %	95 % CI
Haemorrhage	38	(34-41)	40	(33-47)
Sepsis	11	(9-14)	10	(6-15)
Hypertensive Disorders	5	(3-6)	6	(2-9)
Obstructed Labour	5	(3-6)	4	(1-7)
Abortion	8	(6-10)	3	(1-6)
Other Conditions	34	(30-37)	37	(30-44)
Total	100		100	
*Source: Source: SRS Report, (2006)*Includes Gujarat, Haryana, Maharashtra, Punjab.*				

Table: 6, Percentage of Women (aged 15-49) who had Pregnancy, Delivery, Post Delivery Complications and Treatment Seeking Behaviour by Background Characteristics in West Bengal, 2007-08

Selected Background Characteristics		Any Complication During Pregnancy *	Treatment Sought for Pregnancy Complications **	Any Delivery Complication *	Any Post Delivery Complication *	Sought Treatment for Post Delivery Complication **	Total Number of Women
Age of Res.	15-19	75.9	62.1	77.2	48.6	52.9	981
	20-24	72.8	65.7	75.6	45.8	61.6	2743
	25-29	68.9	63.5	71.5	45.0	65.1	1810
	30-34	70.7	65.5	69.4	45.9	66.7	691
	35+	73.6	58.8	67.0	52.8	71.0	294
Birth Order	1st	75.0	71.6	76.6	42.0	59.7	2505
	2nd	69.3	62.3	71.9	45.0	61.3	2029
	3rd	69.5	59.0	73.1	48.1	62.9	981

	4 +	72.2	54.6	70.2	56.9	67.6	1004
Education	Illiterate	69.5	52.3	72.4	50.8	60.2	2289
	< 5 Yrs	74.2	58.0	76.2	49.1	58.1	1224
	5-9 Yrs	73.2	72.7	75.7	44.6	64.0	2258
	10 +	72.1	84.3	66.4	33.1	75.4	748
Caste	SC	70.6	61.8	74.6	44.9	58.7	1979
	ST	62.0	53.0	78.2	41.9	53.3	557
	OBC	69.3	65.3	71.6	37.2	56.2	555
	Others	74.5	66.6	72.7	49.1	65.9	3427
Religion	Hindu	69.6	65.8	73.7	40.3	59.4	4418
	Muslim	77.1	61.8	73.5	58.6	66.6	2005
	Others	58.9	48.3	71.1	35.6	45.5	96
Wealth Index	Poorest	70.4	53.2	75.6	50.9	57.3	1958
	Second	74.7	58.8	72.5	51.6	61.1	1525
	Middle	71.5	63.9	74.1	46.0	65.2	1287
	Fourth	72.2	78.7	75.6	39.5	64.0	1143
	Richest	70.3	85.8	64.9	31.9	79.0	607
BPL	Yes	73.0	59.1	74.7	50.1	61.1	1862
	No	71.6	66.3	73.2	44.8	62.8	4657
Working Status	No	72.2	66.2	73.9	45.6	62.1	4576
	Yes	71.5	59.4	73.0	48.0	62.7	1943

*Source: DLHS 3rd round 2007-08 data sets. *Percentage out of total women **Percentage out of those who have suffered complications.*

Table: 7, Percentage of Women (aged 15-49) who had Pregnancy, Delivery, Post Delivery Complications and Treatment Seeking Behaviour in different Districts & regions of West Bengal, 2007-08.

Districts/Locality/Region		Any Complication During Pregnancy*	Treatment Sought for Pregnancy Complication**	Any Delivery Complication*	Any Post Delivery Complication*	Sought Treatment for Post Delivery Complication**	Total Women
Districts	Darjeeling	68.4	62.1	69.0	42.1	62.5	247
	Jalpaiguri	68.5	66.8	74.8	37.7	61.7	317
	Koch Bihar	76.8	54.5	75.8	59.1	58.6	401
	Uttar Dinajpur	70.8	59.7	68.3	57.3	69.9	674
	Dakshin Dinajpur	62.5	69.7	66.2	44.9	57.8	285
	Maldah	73.6	58.0	74.3	48.1	65.2	424
	Murshidabad	74.8	63.7	71.4	61.9	62.9	497
	Birbhum	69.1	60.1	88.1	52.5	57.1	414
	Barddhaman	70.3	58.8	75.2	44.5	62.8	290
	Nadia	70.8	68.0	56.5	40.9	56.7	253
	North 24 Parganas	76.8	76.7	67.0	46.5	69.9	285
	Hugli	69.0	65.3	77.3	33.5	55.6	242
	Bankura	69.8	69.6	78.8	32.4	61.4	311
	Purulia	66.2	63.8	70.0	39.9	63.1	393
	Pachim Medinipur	79.1	60.6	85.2	49.3	58.9	306
	Haora	77.1	77.8	74.2	41.4	71.9	292
	South 24 Parganas	77.9	61.8	71.2	46.0	57.8	448
	Purab Medinipur	70.4	64.3	82.1	33.8	57.9	358
	West Bengal	72.0	64.2	73.6	46.3	62.3	6606
NSSO Region Wise	Himalayan Reg.	71.9	60.1	73.8	47.7	60.1	965
	Eastern Plains	70.9	62.1	71.7	52.9	63.4	2546
	Southern Plains	76.4	70.4	69.5	43.4	61.7	902
	Central Plains	72.3	67.8	75.4	40.1	64.4	824

	Western Plains	70.9	64.4	78.5	38.7	60.4	1369
HSDI Focus Dist.	HSDI Dist.	71.3	60.9	71.0	53.1	64.0	2674
	Non-HSDI Dist.	72.4	66.5	75.4	41.7	60.8	3932
Locality	Rural	71.5	61.6	73.8	47.6	61.0	5593
	Urban	74.7	77.9	72.3	39.3	70.5	1014

*Source: DLHS 3rd round Data sets. * Percentage out of total women, ** Percentage out of those who have suffered from complication.*

Table: 8, Components of Antenatal Care as Determinant of Maternal Health Care in West Bengal, 2007-08

Components of Antenatal Care		Any complication during pregnancy	Treatment sought for pregnancy problems	Any Delivery complication	Delivery conducted by other persons	Delivery conducted by health personnel	Home delivery due to family matters*	Any Post Delivery Complication	Seek treatment for Post Delivery Complication	Knowledge of the danger signs of new born	Knowledge about danger signs of pneumonia	Knowledge about danger signs of diarrhoea
Number of ANC given	1	72.4	55.2	75.3	61.1	38.1	38.8	53.2	60.2	76.2	37.7	81.8
	2	70.5	45.6	76.4	67.3	32.1	42.7	49.6	59.8	66.9	36.0	77.2
	3+	73.2	73.0	72.7	39.5	60.3	23.8	44.2	64.9	73.5	39.6	86.6
Month when received first ANC	≤ 1	78.8	84.4	73.1	16.5	83.5	11.6	45.1	78.9	81.1	48.0	89.5
	≤ 2	79.0	77.4	76.4	28.7	71.3	15.8	45.8	67.7	73.9	46.3	87.7
	≤ 3	72.7	69.9	72.2	43.1	56.8	27.6	46.4	66.5	73.7	40.0	85.3
	≥ 4	70.9	59.7	74.0	54.8	44.8	33.5	45.7	59.9	70.3	36.0	82.3
Received Full ANC	No	71.6	59.8	74.0	53.3	46.3	33.5	47.1	62.1	70.7	36.8	82.1
	Yes	73.5	81.9	71.8	29.3	70.6	16.3	43.2	63.1	75.8	45.7	90.3

*Source: DLHS 3rd round 2007-08 Data sets; *This indicator includes only those cases where home delivery did not assisted by Health Personnel and family response like 'not necessary, not customary, better care at home, family did not allow, lack of knowledge and others' have been told as a reason for not going to institutional delivery. Other responses like 'Cost, Quality, Transport, No time to go' have been excluded.*