



## Global Journal of Medicine and Public Health

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### A study on socio-demographic correlates of maternal health care utilization in a rural area of West Bengal, India

Mousumi Datta, Nirmalya Manna

Assistant Professor, Department of Community Medicine, Medical College, Kolkata,

88, College Street, Kolkata – 73, West Bengal, India

#### ABSTRACT

**Background:** Improving health of the mother is a global concern. However there is a wide regional variation in maternal health care utilization. The present study was planned to explore the prevailing condition at local level. **Objectives:** To estimate the proportion of women who had utilized maternal health care services and to explore relevant socio-demographic, behavioral and biological co-variates. **Methods:** It was a community based cross-sectional study using cluster sampling technique. The respondents were interviewed with a pre-designed, pre-tested semi-structured questionnaire. **Results:** Most of the respondents were below 25 years, primary educated, primi-para house wives. 80% had early pregnancy registration, 88% had four or more antenatal checkups and 93.6% women had institutional delivery. Most women went to government institutes for their ante-natal checkups and delivery. Majority of the utilization variables were significantly associated with age, education and household wealth index of the respondents. **Conclusions:** utilization of all the components of maternal health care was lower among younger age, lower education and poorer household wealth index.

**Keywords:** Antenatal care, Institutional delivery, early registration, Wealth index

Corresponding Author: Mousumi Datta, 3rd Floor, 168 Brojen Mukherjee Road, Behala, Kolkata 700034, West Bengal, India

E-mail: kishkaushal@gmail.com

Funding: None

Conflict of interest: None

#### Introduction

Maternal health is defined by WHO as the health of women during pregnancy, childbirth and postpartum period.<sup>1</sup> Although motherhood is a fulfilling experience for most women, still many women die or suffer from serious pregnancy related complications. The global maternal mortality ratio is 400 per 100,000 live births. Lifetime risk of maternal death, an indicator which combines both mortality and fertility experiences, is 1.1. There is wide disparity among maternal health indicators between the developed and developing countries. It is estimated for every woman dying, 20 more suffer from pregnancy related complications.<sup>2</sup> Maternal deaths also result in higher morbidity and mortality among the surviving infants.<sup>3</sup> Hence improving maternal health is a global priority. Maternal mortality is difficult to estimate with wide range of uncertainty. So utilization of maternal healthcare provides a proxy measurement for maternal morbidity and mortality. The MDG report states more numbers of women are utilizing antenatal care and

there is narrowing rural and urban gap, however progress has stalled in reducing number of teenage pregnancies. Institutional deliveries are yet to be universalized.<sup>4</sup> The large population based serial surveys like National Family Health Surveys (NFHS).<sup>5</sup> and District level health surveys (DLHS)<sup>6</sup> has shown improvement in maternal health care utilization over the subsequent surveys but still the overall values fall quite below the National Socio-demographic goals. Furthermore there are wide rural-urban, interstate and inter district differences. Institutional delivery rate in India ranges from 11% in Nagaland to 87% in Tamilnadu. Only 17% women in Bihar had 3 or more antenatal visits, while the same figure for Tamilnadu is 95.9% and the proportion at national level is 52%.<sup>7</sup> So the study hypothesis was regional and local differences exist in the pattern of utilization of maternal health care services and despite fair availability of essential maternal health care under reproductive and child health programme in India, utilization may be sub optimal depending on complex

socio-demographic variables. Aim of our study was to explore these variables for improvement of maternal health care utilization. Since we were collecting retrospective data, recall bias by the subjects was a limitation of the study, which we tried to minimize by cross-checking the maternal health cards. The objectives of the study were to estimate the proportion of women who had utilized maternal health care services and relevant socio-demographic, behavioral and biological co-variables of maternal health care utilization.

### Materials and Methods:

**Study Setting and Study Design:** The present study was cross-sectional community based survey, which was conducted in 2011 at the service area of “Rural Health Unit and Training Centre (RHUTC)”, Singur. RHUTC is the rural field practice area of All India Institute of Hygiene and Public Health, Kolkata. The centre is located at Singur block of Hooghly district of West Bengal. It caters primary health care through its primary health centres and subcentres to 63 villages. The area covered was 64.34 square kilometers with a population of about 93,148 (RHUTC Annual Report, 2010). The sub-centers under RHUTC provide essential obstetric care while bedded primary health centers provide both essential and emergency obstetric care. Singur is well connected to the metro city of Kolkata by road and railway. The area is fast urbanizing yet there are some remote, difficult to reach, rural pockets which are underserved. The major demographic indicators like Crude birth rate and Crude death rate of RHUTC service area were 13.8/1000 population and 3.8/1000 population (RHUTC Annual Report, 2010). Sex ratio for Hooghly district was 947 females/1000 males and female literacy rate was 76.9%. (Census, 2011).<sup>8</sup>

**Sample Size and Sampling Method:** Mother of children aged between 0-23 months was the inclusion criterion for study. Sample size was calculated by the formula  $4pq/l^2$ , where, p was the proportion of women with 3 or more ante-natal checkup. In West Bengal it was 62% (NFHS III).<sup>9</sup> Considering 95% confidence interval, 15% allowable error and a design effect of 2, the sample size was 220. Cluster sampling technique was used in this study. Sampling frame was the population listing of villages under RHUTC service area. From listing of individual village population, cumulative population was calculated. It was decided that ten subjects were to be interviewed from each cluster. So the required numbers of clusters were 22 clusters. The total population (N=93148) was thus divided by 22. The number obtained was 4234; this number was referred as sampling interval and denoted by k. A random number (r) 727 was generated by the

excel function RANDBETWEEN with top value of 4234 and bottom value of 0001. Finally, the clusters were selected using the formula,  $f(x) = r, r+k, r+2k, r+3k, \dots, r+21k$ . Out of total 63 villages 22 clusters were selected, which consisted of 22 villages. In this type of sampling design, villages with larger population size have greater probability of being selected.

**Ethical Issues:** This study was approved by Institutional Ethics Committee of All India Institute of Hygiene and Public Health, Kolkata. Informed written consent was obtained from each participant prior to data collection. Respondents were assured about confidentiality of information and its intended use for academic purpose.

**Data Collection:** In each cluster, households were selected by random walk technique. By this method, centre of village was reached and one of the available roads was randomly selected by using last digits of serial number of a currency note. All households in the selected road were listed and only the first household was randomly selected. Next households were serially surveyed. In each cluster, survey was continued till 10 eligible subjects were reached. Eligible women were interviewed by using a pre-designed, pre-tested semi-structured questionnaire. First part of the questionnaire included socio-demographic and personal characteristics and second part contained questions on maternal health care utilization. For measuring socio economic status, household wealth index was used, which includes information on 33 household assets and housing characteristics.<sup>10,11</sup>

**Statistical Analysis:** Data were concurrently entered in Microsoft Excel 2007 spread sheet and simple frequencies and proportions were calculated. We explored association between socio-demographic and maternal health care utilization variables. Epi Info 3.5.1 version was used to calculate p value for  $\chi^2$  test.  $P < 0.05$  was considered as the level of significance.

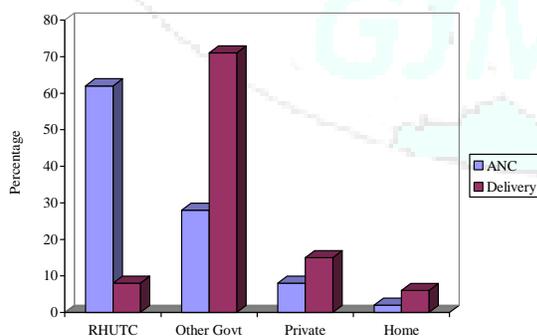
### Results

Total number of women who participated in the study was 220. The age range was between 17 years to 38 years (mean =  $23.9 \pm 0.9$  years). Majority of the study subjects were in the 20-25 years age group (61.4%) with 12.7% of women aged 19 years or less. Overall 74% women were young mothers aged below 25 years. Education of the respondents as well as their husbands was relatively poor with majority of the subjects and their spouses educated up to primary school or less. Most women were housewives (88.6%), living in nuclear families (55.9%) and primipara (62.3%). Only 35.5% were ever users of contraceptives, mostly tubal ligation. (Table – 1)

**Table 1: Background characteristics of study population (n = 220)**

Variable	Frequency	Percentage
Age group (Years)		
≤19	28	12.7
20-25	135	61.4
26-30	40	18.2
>30	17	7.7
Education		
Illiterate	38	17.2
Primary	132	60.0
Secondary	36	16.4
>Higher Secondary	14	6.4
Husband's education		
Illiterate	22	10.0
Primary	119	54.1
Secondary	59	26.8
>Higher Secondary	20	9.1
Occupation		
Housewife	195	88.6
Working	25	11.4
Family type		
Nuclear	123	55.9
Joint	97	44.1
Parity		
Primipara	137	62.3
Multipara	83	37.7
Family planning practice		
Ever/current user	78	35.5
Never user	142	65.5

**Figure 1: Place of antenatal checkup and delivery among study population (n = 220)**



Respondents were asked about utilization of antenatal, intra-natal and postnatal care. More than 80% women got themselves registered within 12 weeks of pregnancy and took the minimum recommended antenatal checkups. Quality of antenatal care was good as 90% or more women received injection tetanus toxoid, their blood and urine was tested, abdominal examination, blood pressure measurement and weight recording was done at every antenatal visit.

Ultrasonography was done among relatively less number of women (39.1%). Consumption of 100 iron folic acid tablets or equivalent amount of iron folic acid syrup (66.8%) and mebendazole for deworming was quite low (18.2%). Institutional delivery rate was 93.6% and more than 80% women received post-partum check-up within 2 weeks. (Table – 2)

It was observed majority of women (>80%) attended government institute for ante-natal checkup and delivery. Among the government institutes, most women visited RHUTC for antenatal checkups but this trend was reversed for delivery care (figure – 1). Ninety four percent of the deliveries were conducted

**Table 2: Utilization of different components of maternal health care (n=220)**

Components of health care	Frequency	Percentage
Early registration (within 12 weeks of pregnancy)	176	80.0
≥ 4 Antenatal Check-up	194	88.2
2 doses of Tetanus Toxoid/Booster	201	91.4
100 tablets/syrup of Iron Folic Acid consumed	147	66.8
Mebendazole tablets consumed for de-worming	40	18.2
Abdominal examination at every visit	202	91.8
Blood Pressure checked at every visit	205	93.2
Weight recorded at every visit	208	94.5
Routine urine examination	202	91.8
Blood for Hb% and grouping	204	92.7
Stool for ova parasite cyst	125	56.8
USG for feto-placental profile	86	39.1
Institutional delivery	206	93.6
Post partum check-up within 2 weeks	182	82.7

by skilled personnel, equally divided among doctors and nursing staffs (figure – 2).

**Figure 2: Persons conducting delivery (n = 220)**

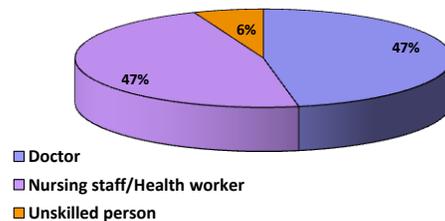


Table – 3 depicts distribution of maternal health care utilization in relation to socio-demographic variables. Early registration, minimum recommended ante-natal checkups, tetanus toxoid immunization and receiving of post partum care within two weeks, all were significantly associated with age group of the respondents. Utilization of all these services was relatively lower among teenage mothers. Education of

the respondents was significantly associated with all the maternal health care variables under study while husband's education was associated with early registration, institutional delivery and post partum care. The service utilization was lower among the illiterate category. Family type was associated with tetanus toxoid immunization and institutional delivery. Parity was associated with minimum recommended antenatal

Table 3: Distribution of maternal health care utilization in relation to socio-demographic Variables (n = 220)

Variable	Early registration	≥ 4 ANC	TT immunization	IFA for ≥90 days	Institutional Delivery	Post partum Care
Age group						
≤19	15(53.6)*	21(75.0)*	21(75.0)*	13(46.4)	25(89.3)	18(64.3)*
20-25	118(87.4)	126(93.3)	129(95.6)	96(71.1)	129(95.6)	120(88.9)
26-30	32(80.0)	32(80.0)	36(90.0)	26(65)	37(92.5)	32(80.0)
>30	11(64.7)	15(88.2)	15(88.2)	12(70.6)	15(88.2)	12(70.6)
Education						
Illiterate	7 (18.4)*	27(71.1)*	25(65.8)*	10(26.3)*	30(78.9)*	22(57.9)*
Primary	124(93.9)	118(89.4)	127(96.2)	102(77.3)	126(95.4)	114(86.4)
Secondary	32(88.9)	35(97.2)	36(100)	26(72.2)	36(100)	34(94.4)
≥HS	13(92.8)	14(100)	13(92.9)	9(64.3)	14(100)	12(85.7)
Husband's Education						
Illiterate	6(27.3)*	17(77.3)	18(81.8)	14(63.6)	18(81.8)*	10(45.5)*
Primary	98(82.3)	105(88.2)	107(89.9)	77(64.7)	110(92.4)	103(86.5)
Secondary	54(91.5)	54(91.5)	56(94.9)	40(67.8)	58(98.3)	51(86.4)
≥HS	18(90.0)	18(90.0)	20(100)	16(80.0)	20(100)	18(90.0)
Occupation						
Housewife	155 (79.5)	172(88.2)	178(91.3)	129(65.1)	183(93.8)	161(82.6)
Working	21(84.0)	22(88.0)	23(92.0)	18(72.0)	23(92.0)	21(84.0)
Family type						
Nuclear	98(79.7)	112(91.1)	117(95.1)*	85(69.1)	120(97.5)*	103(83.7)
Joint	78(80.4)	82(84.5)	84(86.6)	62(63.9)	85(87.6)	79(81.4)
Wealth index						
Poorest	33(60.0)*	39(70.9)*	49(89.1)	21(38.2)*	44(80.0)*	40(72.7)
2 <sup>nd</sup> Quartile	40(72.7)	53(96.4)	50(90.9)	38(69.1)	52(94.5)	46(83.6)
3 <sup>rd</sup> Quartile	48(87.3)	47(85.4)	47(85.4)	45(81.8)	55(100)	51(92.7)
Richest	55(100)	55(100)	55(100)	43(78.2)	55(100)	45(81.8)
Parity						
Primipara	117(85.4)	128(93.4)*	128(93.4)	101(73.2)*	131(95.6)	119(86.8)*
Multipara	59(71.1)	66(79.5)	73(87.9)	46(55.4)	75(90.4)	63(75.9)
Family planning						
Ever/current user	62(79.5)	69(88.5)	71(91.0)	52(66.7)	74(94.8)	68(81.2)
Never user	114(80.3)	125(88.0)	130(91.5)	95(66.9)	132(92.9)	114(80.3)

Figures in the parenthesis indicate percentage, \* Significant at 95% level

checkups and iron-folic acid consumption which was higher among the primipara. Wealth index was significantly associated with all variables except Tetanus Toxoid immunization and post partum care. Occupation of the respondent and family planning practice was not associated with any of the maternal health care variables.

### Discussion

When compared with two large national level surveys, NFHS 3 (2005 -2006)<sup>5</sup> and DLHS 3 (2007 – 2008)<sup>6</sup>, maternal health care delivery in the present study was better in coverage and quality. Antenatal registration within first trimester of pregnancy in rural West Bengal (32% and 38.8%) was lower than the present study (80%). All women received at least one antenatal checkup in the present study. It is slightly lower in rural West Bengal (90% and 96%), in the slum of New Delhi (76%)<sup>12</sup> and in the overall country (77% and 75%).<sup>5,6</sup> It was observed that four or more ante-natal checkups were lower among teenagers, illiterate women, women with illiterate spouse, poorer household wealth index and higher parity. Likewise in NFHS3 utilization of antenatal care decreased with increasing age, lower education, higher parity and lower wealth index. Multivariate analysis of a study conducted by Khatib N et al (2009) has shown age of pregnant women, time of registration and gravidity status were important predictors of utilization of at least three antenatal checkups.<sup>13</sup> Another study conducted by Singh S et al at Varanasi (2007), mentioned that education was one of the most important factors in availing the full antenatal care.<sup>14</sup> For most women (62%) place of ANC in the present study was a sub-centre or union health centre of RHUTC which is almost similar to the study by Banerjee B. (2003) where 64.2% women utilized ANC services from urban health centre.<sup>15</sup> TT immunization was more than 70% for overall country; it was even higher (more than 90%) for rural West Bengal and in the present study. Consumption of IFA tablets or equivalent amount of IFA syrup for 100 days or more was uniformly poor; it was slightly higher for overall India in DLHS 3 (46.6%). In the present study this proportion was 66%, which though higher than comparable data, is still quite low as one out of every three women was not taking adequate prophylaxis against nutritional anemia in pregnancy. IFA consumption was lower for very young (<20 yrs) or older women (35-49 years).

TT immunization was lower for older women while utilization of both the services decreased with increasing parity, lesser years of schooling and lower wealth index in NFHS 3. In the present study age, education and family type were associated with TT immunization while education and parity were

associated with IFA consumption. According to NFHS 3, only 4% women were given medicine for de-worming.

Women receiving an anthelmintic drug were only 18% in the present study. It was a general observation that open field defecation was a common practice in the study area but only 56% women reported that their stool was examined for OPC. Possible high prevalence of intestinal helminthiasis with lower rate of de-worming coupled with low IFA consumption may result in high prevalence of anemia in pregnancy. Lower rate of de-worming and low IFA consumption in the given situation need to be addressed. Low IFA consumption (5.8%) was also reported in a study by Lal S et.al (2001).<sup>16</sup>

Abdominal examination, checking of blood pressure and weight, urine and blood test during antenatal chekups varied from 58% to 72% in NFHS 3. Utilization of all these components was quite impressive in the present study; for most components there were more than 90% utilizers. Less than half of women interviewed in the two national surveys had institutional delivery and same can be said for the postpartum checkup. Both institutional delivery and postpartum check up were much higher in the present study (93% and 82%).

It has been observed in NFHS 3, the proportion of births occurring in a health facility is higher for younger mothers and lower parity. Institutional deliveries is also higher among mothers who had four or more antenatal care visits (75%), higher education for self and spouse and higher wealth index. Also in the present study, higher proportions of women having four or more antenatal visits were more likely to deliver in an institute. It is most important to have the first postnatal check-up within a few hours of birth. Another important time for a postnatal check-up is six weeks after delivery. Majority of women (58%) did not receive any postnatal check-up after their most recent birth.<sup>4</sup> Only one-quarter of women (27%) received a health check-up in the first four hours after birth and only 37 % received a health check-up within the critical first two days after delivery. The likelihood of a birth being followed by any postnatal check-up and that within two days increases with the educational level of the mother and the household wealth index which is in agreement with the present study. There were no marked variations by mother's age, but utilization of postnatal check-ups decreases with increasing birth order.<sup>5</sup> However in this study age, parity, education of self and spouse, wealth index all were significantly associated with utilization of post partum care.

## Conclusion

The utilization of maternal health care services was higher in the present study; the pattern remains the same with lower utilization by women with less education, younger age, lower income and higher parity. Embedded social structures results in a continuum of outcome affecting lives of women; a girl born in a poor family is less likely to be educated, more likely to be married early in another poor family, less likely to access family planning services, would start child bearing early and frequently. These are the women who need maternal health care services most, yet they are least likely to utilize those services even when they are available. This study reinforces the doctrine that female education and women empowerment are the two major drivers in improving health and lives of women.

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