Social Divide in Maternal Health Care Use in Rural India: The Relative Impact of Education and Economic Status

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Abstract

Paper attempts to understand the complexity in association between caste background of a woman and utilization of health care services in rural India. Caste-based differentials in utilization of maternal care services are examined to assess whether they arise due to deprivation in income, education or cultural factors. In terms of factors contributing to caste-based deprivation in utilization of maternal care services, the gross effect of educational level of woman was more than her economic status. However effect of these three variables were distinct across various components of maternal care services examined. This case focused analysis also demonstrates how utilization of antenatal care services promotes the preference for institutional deliveries, while the utilization of antenatal care service and institutional facility for delivery jointly promote the acceptance for post natal care services in rural India. Hence these three services needs to be promoted together towards ensuring right to safe motherhood among these vulnerable sections of the society.

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Making pregnancy safer has been the central concern of population policies in the post ICPD regime, since mid 1990s'. Pregnancy related health care need of women include; antenatal care during pregnancy, provision of safe delivery facilities and post natal care after delivery. Here antenatal care (ANC) is necessary in order to prevent certain complications, such as anemia, and identify women with visible pregnancy complications for intervention or referral. Similarly safe delivery care facilities essentially institutional births, reduces the risk of both maternal and infant mortality. Due to limitations in availability of health facilities across the country institutional deliveries are not emphasized at the public policy level, where the focus is on deliveries attended by trained medical professional which an be a doctor nurse, midwife or a lady health visitor. The postnatal care (PNC) is essential for identifying and attending to the postpartum complications. Even though there is no complication, post partum checkups are recommended within one-two months of delivery, which is particularly important in the case of non- institutional delivery. Following childbirth, mothers are prescribed medicines, tonics and nutrients to overcome maternal depletion if any as a part of post-natal care.

It is well known that there is multiplicity of factors influencing utilization of health care services including maternal care services. Findings based on National Family Health Survey (I & II) reveal factors like, mother's age and education, standard of living of household and child's birth order with a strong bearing on the likelihood of institutional delivery (Sugahthan et al 2001). According to this study the effect of caste/tribe identity becomes least relevant and statistically insignificant when the other variables are controlled. Multivariate analysis of the data from National Sample Survey in the year 1995-96 also displays the importance of mother's education/knowledge of health production function and physical access to health care services in determining utilization of maternal care services in a population (Sarma and Hemel 2007). However, this study which does not take into account the economic background of woman finds significant caste based inequalities in access to maternal care services. Another study using a caste and class based framework observes very stark inequities within each caste, between men and women, and across castes in utilization of health care services (Iyer 2005). Navaneetham and Dharmalingam (2002) in an analysis of south Indian states finds a mixed picture with that the being a caste background of a woman being immaterial in utilization of ante natal care services, but it does play a role in utilization

of institutional facility for delivery. Here the analysts categorized the caste variable into just two groups (Schedule caste/ tribe and Others), attribute the under utilization of maternal care services among the lower social group to their settlement pattern and socio-economic seclusion.

The present work intends to focus on understanding caste-based deprivation in access to maternal care services. The NSSO (2006) report points out the caste-based differentials in morbidity and utilization of health care services in India. Here too reported morbidity among lower castes is low despite their increased vulnerability to illness, which is often associated with their poor perception about illness and good health. Further, it is found that a significant proportion of ailments that go untreated due to financial reasons are also explained in terms of poor access to health care services. This lack of utilization of health services in general is no different with regard to utilization of maternal care services that indicate a disparity across caste groups (IIPS and Macro 2007; IIPS 2006). There are also evidence to show suggest that differentials between social groups category are partly due to difference in socio-economic conditions but in some states differentials persist even after adjusting the effect of socioeconomic factors in other states in the country (Roy et al 2004). Hence, there is a need to understand the complexity in possible association between caste background and utilization of health care services, which is explored here. Caste-based differential in utilization of maternal care services is examined to assess whether they arise due to deprivation in income, education or cultural factors.

The national sample survey organization, which is the only provider of data on household level expenditure pattern, brings out the stark differentials in average monthly percapita expenditure (MPCE) of household across different caste groups in India (NSSO 20001). Average MPCE figures for the Schedules castes (SC) and Scheduled Tribes (ST) groups were much lower compared when compared with the general population, in both rural and urban areas. According to this report the MPCE level of the OBC was better than those for SC and ST but not comparable with that for population belonging to the social group 'others'. Deprivation in household level literacy, assets and amenities between scheduled tribes, scheduled castes and other castes is well documented (Srinivasan and Mohanty 2004). This study also finds that the current levels of abject poverty are higher among the scheduled tribes and castes compared to the rest of the population. All these caste based deprivation is an outcome of the historically rooted social and economic disadvantages of lower castes, which are yet to disappear due to various reasons. Now the curiosity remains as to whether the effect of caste prevails despite controlling for the deprivation in terms of their income and

educational levels? If not then there are other cultural factors that are responsible for this divide in utilization of maternal care services.

With this backdrop, this paper examines the caste-based deprivation observed in utilization of maternal care services. Quite often the existing caste wise differentials in health outcomes and health care utilizations are pegged to existing inequities in educational level and income. Here the focus lies in interpreting the gross effect of caste, in utilization of maternal care services and reflect upon its interrelationship with their corresponding income and economic background. While doing so, we are able to describe the' net' effect of caste background on utilization of maternal care services after controlling the effect of education and income related disparities. While it is claimed that physical accessibility has a role in determining utilization of maternal care services (Sarma and Hemel 2007), there are studies indicating availability of an all-weather road connectivity of the village does not have a statistically significant effect on institutional delivery in most cases (Sugathan et al 2001). This contradiction is relevant given the caste-based advantage in residence i.e. upper caste frequently locates themselves in accessible places compared with lower caste. However, exposure to urban life and interaction with other communities for a longer period of time is likely to reduce their caste induced preferences in choice of maternal care services. In order to avoid this conflict of positive association between better access and urban residence, this analysis has been limited to rural India.

Data and Methods

The analysis is based on the rural sample from 60th round (2004) survey of National Sample Survey Organisation, Government of India on "Morbidity and Health Care". This survey carried out between January- June 2004, covered 47,302 households in rural India using a two stage stratified sampling design. Particulars of maternity health care including; delivery care, antenatal care and post-natal care for ever married women of age below 50 years during last 365 days prior to the survey, were collected in the survey. Study sample comprises of a total of 4649 women who had given birth during the one-year reference period. Women who were pregnant on the date of survey were excluded from this analysis, as their information on any of these services during maternity is incomplete. Class wise inequalities in access to maternity care services across income and educational background of woman were explored using the variation in share of non-institutional deliveries, non use of antenatal care and non use of post natal care, across these two sub groups. As it is difficult to collect reliable income data, the NSSO collects data on consumption expenditure in its surveys. The monthly per capita consumer expenditure (MPCE) information thus

available for each sample household is used as a proxy for income level of the woman included in this anaysis.

Here we have explored both 'gross' effect and the 'net' effect of caste status of woman on utilization of maternity care services using chi-square test and logistic regression respectively. The caste-class and caste-educational level inequality regarding the above stated three maternal care indicators are initially examined using a simple measure of association (Roy et al 2004). Initially a chi square test (un-weighted values) is performed to between caste and MPCE/ educational background of woman for each of three maternal care sevices under the study. Here Chi-square ($\chi 2$) value obtained from this test and its significance level together indicates the nature of association or inequality in the distribution between two variables. Further the degree of association is assed using an index of MPCE inequality measured by computing $\sqrt{(\chi 2/N)}$. Here higher value of index indicates a strong association, implying high inequality while a relatively lower value i.e a weak association implying low inequality. Similar procedure is repeated in computation of an index of education-related inequality in maternal care use across social groups. The advantage of these two indices aimed at understanding the gross effect is that they are comparable within caste groups and also between themselves.

Logistic regression analysis is undertaken for understanding the independent effect of caste, economic background and education of woman on utilization of maternal care services. Three separate analysis is performed with risk of (1) non institutional delivery (Yes=1; No =0), (2) no antenatal care (Yes=1; No =0) and (3) no post natal care (Yes=1; No =0), as the dependent variables. The variables age of woman and household size are used as covariates in each of the regression model. In this multivariate analysis, the variable household size has been included as a covariate to factor in the impact of household size on measurement of monthly per-capita consumer expenditure of the household (Deaton and Paxson 1998). Two variables have been included in the model in order to account for the interaction effect between economic status and educational level in the population. These interaction terms are (1) higher MPCE (60-80 & 80-100 MPCE quintiles) and high school educated and above and (2) lower MPCE (0-20 & 20-40 quintile) and illiterate. Evidence suggests that delivering in an medical institution is influenced by use of antenatal care services in India (Sugathan et al 2001). Because of this we have controlled for the variable on use of ANC care in the regression model where type of delivery is the dependent variable. Similarly the effect of use of ANC services and institutional delivery has been controlled in the regression model with use of PNC services as the dependent variable.

Results

Pattern of utilization of Maternal Care Services

Analysis shows wide spread variation in utilization of maternal care services not only between caste groups, but also this variation is consistent across the three types of maternity care services under study (Table 1).

Information on source of ANC for women who had given birth to a child during the last 365 days, shows that nearly 73 per cent of them had received some form of antenatal care in rural India. The proportion not availing ANC was highest among scheduled tribes (36 percent) and lowest in 'others' category (19 percent). Unlike in the case of delivery care the proportion availing ANC from government providers too was highest among scheduled tribes (48 percent). At the same time, scheduled tribe women (16 per cent) and scheduled caste women (26 per cent) choose private sector for antenatal care as against other caste group among whom this percentage is reasonably higher. This underlines the significant role played by public providers in provision of ANC services in the rural areas and inability of private providers in reaching the most vulnerable.

As per this survey 65 percent of childbirths in rural India are non-institutional births or home deliveries. About 18 percent of deliveries were in government hospitals and remaining 17 percent in private hospitals. Share of non institutional births depicts a wide range between 79 percent among scheduled tribes to 57 percent among "Others" category, who are essentially the upper/forward castes according to the social hierarchy of caste prevailing in India. Here one has to note that the overall prevalence for institutional delivery itself is less frequent in India. Among those who have opted for institutional delivery, the public private-divide is highest among Scheduled tribes and lowest in 'Others' caste category among whom the overall preference for public hospitals is lesser when compared to the preference for delivery in a private hospital.

----Table 1---

Only 62 percent of the women are reported to have received post natal care. As expected the proportion not receiving postnatal care was highest among ST population and lowest among "Other" Castes . Another interesting observation is that it is the private providers, who are more actively involved in provision of PNC care than the government sources, except

among the ST population. This is notable as the private sector, which paying lesser attention in provisioning of provision of delivery care nor ANC services, focuses more in delivering the relatively cheaper PNC services.

Caste inequities in Utilisation of Maternal Care Services

As in the case of general population a systematic economic and educational differentials in access to maternal care services are expected across various caste subgroups. Here bi-variate analysis indicates the level of such differentials and index of inequality represents the nature of association between caste background and educational and income level of the woman. In addition an exposition is made here as regard the differences in MPCE and educational related deprivation of maternal care services among various caste subgroups.

----Table 2---

Non use of ANC Services: Variations in proportion not using ANC services among pregnant women who had given birth during last 365 days, across caste-MPCE class subdivisions are presented in Table 2. At the aggregate level, there is a consistent decline in proportion not using ANC from 33 percent in poorest quintiles to 11 percent in richest quintile. Lowest level of utilisation is observed among the scheduled tribes in the 20-40 MPCE quintile (42 percent), while the scheduled tribes in the richest quintile had the highest level of utilization of ANC care services. However index of MPCE inequality is lowest among ST population and highest among OBCs. This indicates that income associated inequality in ANC care is the least among STs and the same is the most among other caste groups. As regard education related inequalities again, they are more orderly except in the case of scheduled tribes. Lowest level of use of ANC was noted for illiterates among Scheduled castes, while 'Utilization level are almost universal among high school educated in the "Other" caste category. Index of education related inequality is highest for Scheduled castes and other backward class and lowest among scheduled tribes. Index clearly shows that as regard utilization of ANC, the education related deprivation is more than income/MPCE related deprivation.

----Table 3 ----

Non-Institutional Births: Substantial differentials are noted in share of non institutional births among total births reported in last one year across caste-class subgroups. This ranged from 86 percent in ST population in 20-40 MPCE quintile to 37 percent is noted in the richest quintile in the 'others' category. The corresponding gaps were marginally higher when contrasted across education categories. Proportion not availing institutional facilities was highest among the illiterate scheduled tribe, and lowest among high school and above educated woman belonging to other castes. An MPCE wise inequality in utilizing institutional facilities was highest among "Others" castes followed by Scheduled tribes, other backward class and lastly scheduled castes. At the same time education wise inequality was highest among scheduled caste followed by Other backward class, "Other " castes and Scheduled tribes respectively. At the aggregate level the index of MPCE inequality (0.232) is relatively lesser than index of education inequality (0.308). This again reaffirms the relative role education as against income level in influencing utilization of institutional delivery is across all caste groups.

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Non Use of Post Natal Care Services: Unlike in the case of institutional births and ANC care, MPCE quintile wise differentials in proportion not seeking PNC care was not showing any specific pattern even across any of the caste subgroups. However education wise differentials were systematic across all subgroups excepting scheduled tribes. Here too the education-caste association is stronger than income-caste association in terms of utilization from PNC services.

Multivariate Analysis

Results of logistic regression analysis of non-use of ANC care during pregnancy, indicated that being scheduled caste or scheduled tribes has got a significant effect. Risk of not receiving ANC care is 1.5 times and 1.4 times higher among scheduled tribe and scheduled caste respectively. The differentials in the same between other backward class and 'Other' caste were insignificant. It confirms that the woman from a poorer economic background and low level of education are less likely to seek ANC during course of pregnancy, than their counterparts from better economic and educational background respectively. Illiteracy emerges as the most important factor behind non use of ANC care.

Analysis of determinants of non institutional deliveries indicate that social group variable is significant only in the case of 'scheduled tribes' where the odds of an non-institutional birth was 1.4 times more than in the case of 'Other castes'. However the economic and educational background of woman was having a significant effect on utilization of maternal care services. As compared to the richest MPCE quintile the likelihood of non institutional birth declined systematically from poorest to the richest quintile. Similarly an illiterate woman and literate but below high school educated woman are 5.6 times and 2 times more likely to have a non institutional birth than a high school educated woman respectively. As compared to a woman who have received ANC the odds of having an non institutional delivery was 3.2 times more among women who have not received ANC.

Place of delivery and use of ANC have a very strong and positive effect on utilization of PNC care after the delivery in the population. As in the case of delivery care, the scheduled castes are very much less likely to seek PNC care than other caste groups. It is interesting to note that when controlled for other effects, economic background of woman has a negative effect on non use of PNC. Women belonging to 0-20 and 20-40 MPCE quintile are more likely to avail PNC care services than their richer counterparts. Perhaps PNC care is availed only when there are pregnancy complications and poorer women who are more likely to have non-institutional births are more like to have such complication than their richer counterparts. Level of education of the woman is not having any influence on their decision to use PNC care.

Discussion
The above analysis unfolds the complex interaction of caste and other capability attributes like education and income level influencing the utilization of maternal care services at the time of delivery.   Such an exposition is intended to highlight source of inequality in ultimate terms rather than the ones surfacing due to education or income as regard the utilization of these services. In terms of factors contributing to caste-based deprivation in utilization of maternal care services, the gross effect of variable on educational status was more than the variable representing economic status. However effect of these three variables were distinct across various components of maternal care services examined. Despite controlling for background characteristics like economic and educational level, being a scheduled tribe was having a negative influence on non-utilization of maternal care services. To what extent this could be due to physical availability of health care services in tribal areas or due to their

cultural prejudices, could not be investigated further due to limitations in this data set. The caste wise differentials between scheduled castes, other backward class and other castes noted earlier (Table 1), vanishes when controlled for other background characteristics of woman. Hence whatever differentials observed between three caste groups is mainly due to their overall deprivation in economic status and educational level.

Other policy related observation is that utilization of ANC services promotes the preference for institutional deliveries, while the utilization of ANC service and institutional facility for delivery jointly promote the acceptance for PNC services in rural India. Hence these three services needs to be promoted together towards ensuring right to safe motherhood across the country. Considering the limitations in availability of manpower and infrastructure at this juncture and inability to cater to increasing delivery care in immediate future, the step taken by National Rural Health Mission towards making births to be attended by trained medical professionals needs to the encouraged. This along with the public provision of relatively inexpensive ANC and PNC services only can ensure safe mother hood and child survival among the low social groups, a segment where the focus of profit oriented private sector is presently limited.

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Table 1: Source for selected maternal care services for ever married women who had given birth during last one year by caste, Rural India 2004

Type of maternity care	Source for maternal care services (%)				
	Scheduled Tribe	Scheduled Caste	Other Backward Class	Others	Total
Source for ANC care					
government facility	48.3	42.4	43.6	45.1	44.2
private source	16.0	25.7	29.6	35.8	28.5
No ANC	35.7	31.9	26.8	19.1	27.3
All	100	100	100	100	100
N (Un-weighted)	*647*	*958*	*1875*	*1154*	*4634*
Place of delivery					
Of non institutional					
government hospital	15.0	20.2	17.4	19.4	18.3
private hospital	6.5	11.2	18.7	23.6	16.6
Home	78.5	68.6	63.9	57.0	65.1
All	100	100	100	100	100
N (Un-weighted)	*652*	*962*	*1879*	*1156*	*4649*
Source for PNC Care					
government facility	32.5	26.3	29.3	25.2	28.0
private source	19.1	32.3	34.9	42.5	34.2
No PNC	48.4	41.4	35.8	32.3	37.6
All	100	100	100	100	100
N (Un-weighted)	*629*	*954*	*1857*	*1139*	*4579*

Source: Computed from the 60th round NSSO data on "Morbidity and Health Care"

Table 2: Caste differentials in proportion not receiving ante-natal care (ANC) by monthly per capita consumer expenditure (MPCE)Quintile and educational level, Rural India 2004

MPCE Quintiles/ Educational level	percentage of women not receiving ANC care				
	Scheduled Tribe	Scheduled Caste	Other Backward Class	Others	All Castes
MPCE Quintiles					
0-20	37.6	37.5	33.6	18.9	33.2
20-40	42.0	28.9	34.2	31.9	33.3
40-60	29.9	28.7	25.1	17.9	24.5
60-80	31.8	33.5	18.9	19.8	22.9
80-100	7.9	23.1	8.1	9.4	11.2
Educational Level					
Illiterate	37.2	39.6	34.1	30.8	35.6
Literate below high school	29.9	16.7	18.2	15.0	17.7
High school and above	31.8	10.5	9.4	5.0	8.3
Total	35.7	31.9	26.8	19.1	27.3
Index of MPCE inequality	0.123*	0.130**	0.182**	0.141**	0.152**
Index of education inequality	0.138**	0.234**	0.235**	0.221**	0.233**
N	646	957	1875	1150	4628

Source: Computed from the 60th round NSSO data on "Morbidity and Health Care"
** and * indicates corresponding chi-square value used for computing index of inequality significant at < 1 percent level and < 5 percent level respectively

Table 3: Caste differentials in share of non institutional births by monthly per capita consumer expenditure (MPCE)Quintile and educational level, Rural India 2004

MPCE Quintiles/ Educational level	percentage of non institutional births				
	Scheduled Tribe	Scheduled Caste	Other Backward Class	Others	All Castes
MPCE Quintiles					
0-20	82.8	80.4	75.1	76.2	78.2
20-40	86.2	66.6	70.5	66.3	70.6
40-60	72.3	65.1	60.3	58.0	61.8
60-80	58.6	66.5	56.4	49.4	56.7
80-100	55.2	36.6	39.8	37.2	38.7
Educational Level					
Illiterate	83.6	78.7	76.7	73.2	77.8
Literate below high school	64.6	50.1	50.2	55.5	52.8
High school and above	37.1	35.2	27.8	27.6	29.1
Total	78.5	68.6	63.9	57.0	65.1
Index of MPCE inequality	0.224**	0.185**	0.223**	0.246**	0.232**
Index of education inequality	0.220**	0.320**	0.305**	0.288**	0.308**
N	651	961	1879	1153	4644

Source: Computed from the 60th round NSSO data on "Morbidity and Health Care"
** and * indicates corresponding chi-square value used for computing index of inequality significant at < 1 percent level and < 5 percent level respectively

Table 4: Caste differentials in proportion not receiving post natal care (PNC) by Monthly per capita consumer expenditure (MPCE)Quintile and educational level, Rural India 2004

MPCE Quintiles/ Educational level	percentage of women not receiving PNC				
	Scheduled Tribe	Scheduled Caste	Other Backward Class	Others	All Castes
MPCE Quintiles					
0-20	44.3	36.8	38.2	20.6	36.2
20-40	45.4	48.8	35.7	38.5	40.7
40-60	65.9	40.3	39.0	38.7	41.5
60-80	55.4	42.6	33.0	30.2	35.8
80-100	24.9	39.4	27.6	30.9	30.9
Educational Level					
Illiterate	50.6	46.4	39.7	34.9	42.5
Literate below high school	39.3	31.2	31.9	33.1	32.6
High school and above	50.5	29.0	23.3	25.2	25.9
Total	48.4	41.4	35.8	32.3	37.8
Index of MPCE inequality	0.077	0.025	0.082*	0.083	0.063**
Index of education inequality	0.058	0.154**	0.110**	0.125**	0.122**
N	628	953	1857	1136	4574

Source: Computed from the 60th round NSSO data on "Morbidity and Health Care"

** and * indicates corresponding chi-square value used for computing index of inequality significant at < 1 percent level and < 5 percent level respectively

Table 5: Results of logistic regression analysis on probability of non use of maternal care services, Rural India, 2004

	No ante natal care		No Institutional Delivery		No post natal care	
	Odds ratio /Exp(B)	S.E. (B)	Odds ratio /Exp(B)	S.E. (B)	Odds ratio /Exp(B)	S.E. (B)
Social Group (Other Castes =0)						
Scheduled Tribe	1.530**	0.128	1.401*	0.139	1.581**	0.458
Scheduled Caste	1.425**	0.106	0.959	0.101	1.191	0.175
Other Backward Class	1.190	0.098	0.893	0.089	1.016	0.016
MPCE Quintile (80-100 Quintile =0)						
0-20	2.024**	0.195	2.964**	0.154	0.539**	0.166
20-40	2.294**	0.192	2.1417**	0.149	0.728*	0.160
40-60	1.689**	0.165	1.513**	0.129	1.014	0.135
60-80	1.699**	0.172	1.351*	0.132	0.848	0.140
Education level (High school & above =0)						
Illiterate	3.622*	0.244	5.643**	0.185	0.945	0.201
Literate below high school	1.605*	0.235	1.955**	0.169	0.936	0.189
High school and above	1		1		1	
Received ANC Care (Yes =0)	NA		3.208**	0.092	5.066**	0.076
Institutional Birth (Yes =0)	NA		NA		2.148**	0.080
Age of woman@	1.017	0.006	1.029	0.007	0.997**	0.006
Household size@	1.014	0.011	1.033	0.011	0.987	0.011
Education and MPCE interaction						
High MPCE & High school edn (yes =0)	1.484	0.362	1.143	0.134	1.226	0.362
Low MPCE Quintiles & illiterate (yes =0)	1.067	0.159	1.582**	0.458	0.926	0.159
Constant	0.024	0.353	0.064**	0.279	0.285**	0.27
-2 log likelihood	5068.212		5081.287		5269.66	
Number of cases	4600		4600		4537	

** P < 0.01; * P< 0.05
@ these variables are used as covariates in the model
Source: Computed from the 60th round NSSO data on "Morbidity and Health Care"