

Social Inequalities in Health and Nutrition in Selected States

While a large number of primary health centres and subcentres have been created as part of the government's 'Health for All' programme, surveys such as NFHS-1 and 2 reveal that health services either do not reach disadvantaged sections or are not accessed by them. This paper assesses the extent of inequalities in health care and nutritional status across states with a focus on caste and tribe. It examines how far these inequalities are a result of caste/tribe per se or whether they can be attributed to differential economic and educational conditions of individuals belonging to different caste/tribe categories.

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The wide gap between rich and poor has always been a matter of concern in India. It is now widely accepted that the issue is not just confined to economic inequalities; the wider issue that needs to be addressed is the 'inequality of opportunities'. In fact, the task for the nation, which Pandit Nehru identified half a century ago included 'ending of not only poverty, ignorance, disease' but also 'ending of inequality of opportunities' [Gopal 1983]. This dimension has assumed special significance recently in the context of new economic reforms. There is a fear that inequalities will be further intensified as the poor and the weak are likely to be marginalised in this process because the expanded economic opportunities are difficult to be used if a person is handicapped by ill-health or illiteracy. Education and health are recognised to be the two distinct influences which can promote the freedom and capability of individuals to make use of available opportunities [Dreze and Sen 1995]. Policies for universal literacy and 'health for all' can go a long way to increase the individual capabilities but even here the utilisation of services by the disadvantaged sections of the society is limited due to socio-economic constraints. This can lead to serious inequalities in the very sectors – health and education – which are expected to play the equalising role in India's struggle to reduce inequality of opportunities. In a caste-ridden society like India, social hierarchy also can be a serious handicap for utilisation of available services in the health and educational sector. This paper examines health and nutrition inequalities between four broad caste/tribe groups in Indian society.

India is committed to the goal 'health for all' and in the last four decades, a wide network of primary health centres and subcentres has been created. Yet most of the states in India are far away from this goal. Many surveys as well as NFHS-1 and NFHS-2 have provided ample evidence to show that either the services do not reach the disadvantaged sections of the society or people from those sections do not utilise the available services. Apart from economic condition, the social hierarchy or the system of social stratification existing in the society is likely to influence the health behaviour of individuals. Social stratification system determines the living conditions, privileges, obligations and cultural traditions surrounding the life of a person which in turn affect his perceptions regarding health, knowledge of health care and accessibility to health resources [Kopparty 1994]. Food availability and purchasing power of individuals are the important

determinants of the nutritional status of a person but it is also affected by the diet pattern, lifestyle, cooking practices and many cultural traditions like child rearing practices and pregnancy care practices. In India, the caste/tribe represents the traditional ascriptive framework of life conditions, values and social choices. Class and achievable social status is represented by education, occupation and economic status, but often there is a strong overlap between caste and class.

The National Family Health Survey, India which has provided data on a variety of health and nutritional indicators by caste/tribe, by education and by standard of living (which can be taken as a proxy for economic conditions) provides ample opportunity to examine the social inequalities in health and nutrition in the above context. This paper attempts to assess the extent of inequalities in health care and in nutritional status existing in various states with focus on caste/tribe. It also examines how far these inequalities are the result of caste/tribe per se or whether they can be attributed to the differential economic conditions and educational status of individuals belonging to different caste/tribe categories.

I Data and Methods

This study utilises data from NFHS-2, the large-scale survey on demography and health recently conducted in India. The NFHS-2, conducted in 1998-99, collected information from a nationally representative sample of 92,486 households and 90,303 ever-married women age 15-49. It provides estimates for the country as a whole and all the 26 states that existed at the time of the survey. The survey collected information on a variety of aspects related to fertility, family planning practice, mortality, utilisation of maternal and child health care services, nutrition and health. Apart from this, it also gives data on basic socio-economic characteristics of households and ever-married women. The survey provides information on four caste/tribe groups, namely, scheduled castes (SC), scheduled tribes (ST), other backward classes (OBC) and those who are neither SC nor ST nor OBC and are designated as 'others'. According to NFHS-2, at the all India level, 19 per cent women belonged to SC households and 9 per cent came from ST households. A higher proportion of both these groups, particularly the latter, were

staying in rural areas than in urban areas. Almost one-third of women belonged to OBC households and 39 per cent were in 'others' category. The distribution of women by caste and tribe varies by state. In this paper initially inequalities are discussed for almost all the states but only 11 states where the sample size for all the four groups was found adequate, have been considered for the detailed analysis.

Inequality by caste and tribe is examined in this paper with regard to the following deprivation indicators:

(1) *Four socio-economic indicators:*

(i) Low standard of living; (ii) Illiteracy; (iii) No exposure to media; (iv) No health facility within locality

(2) *Two programme indicators of utilisation of health services:*

(i) Non-utilisation of ANC services; (ii) Unsafe delivery (delivery not assisted by a health professional).

(3) *Two nutritional status indicators*

(i) Low body mass index (BMI < 18.5 kg/m²), (ii) Prevalence of any anaemia.

The SLI is based on different facilities and ownership of amenities in a household (International Institute for Population Sciences and ORC Macro 2000). The BMI is calculated as weight in kilograms divided by the height in meters squared. A BMI of less than 18.5 kg/m² usually indicates chronic energy deficiency. A non-pregnant woman is considered anaemic if her haemoglobin level is less than 12 grams/decilitre. For a pregnant woman, the cut-off level for being anaemic is 11 grams/decilitre. The two programme related variables, namely ANC and safe delivery are available only for those women who gave birth during the three years preceding the survey.

To study inequality regarding each of the above indicators among the four caste/tribe groups, a simple measure of association has been used. For example, to understand whether distribution of women (unweighted values) by SLI differs according to caste/tribe, we employ a chi-square test of association between the two variables. If the test reveals significant value of χ^2 – which indicates an association or inequality in the distribution between two variables – the degree of association is also measured by computing $\sqrt{(\chi^2/N)}$. An association between caste/tribe and SLI reveals that women of different caste/tribe groups are not equal in terms of their distribution by SLI. Then the states were ranked according to the value of $\sqrt{(\chi^2/N)}$. The lower rank indicates a strong association, which implies high inequality while a higher rank indicates weak association which implies low inequality. In case of states with insignificant values of χ^2 , they are given tied ranks. Similar procedure is followed to examine inequality between four caste/tribe groups regarding each of the 8 indicators given above.

Establishing an association between caste/tribe and either the health or nutrition variables is not enough. The association may occur because of a difference in the distribution of women belonging to different caste/tribe by their socio-economic characteristics. This can happen because the socio-economic characteristics are generally related to either the nutritional status indicators or the programme related health indicators. For example, higher the education, greater is the chance that a woman will go for antenatal care and have her child delivered in the presence of a health professional. It is essential to adjust the effect of these other variables and see the effect of caste/tribe per se. The association has, therefore, been examined further by adjusting various socio-economic and demographic characteristics. This is attempted by employing a logistic regression. Four

separate regressions have been carried out considering each of the variables in group B and C, i.e., two nutrition indicators and the two programme related health indicators as the dependent variable. The independent variables, in all the four models include, apart from caste, women's age, place of residence (rural/urban) and 4 socio-economic indicators, i.e., education, SLI, exposure to mass media and access to health facility (group A).

II Results

Caste/Tribe Composition

As shown in Table 1, one-third of all-India sample of women belongs to OBC category; nearly one fifth belongs to scheduled castes, less than 10 per cent are from scheduled tribes while the remaining (about 40 per cent) belong to castes other than SC, ST and OBC. All the northern states (except Rajasthan) as well as Kerala, Goa and Tamil Nadu have negligible percentage of scheduled tribe women while nearly one-fifth of women in Madhya Pradesh, Assam, Orissa and Gujarat belong to scheduled tribe households. Nearly one fourth of all women in Punjab, West Bengal and Tamil Nadu are scheduled caste women. Bihar, Orissa, Haryana, Uttar Pradesh, Himachal Pradesh and Andhra Pradesh are the other states with a sizable proportion (nearly one fifth) of scheduled caste women. Goa and Kerala are the two states where SC women are relatively much less (less than 10 per cent). Tamil Nadu has the largest (three-fourth) proportion of women in OBC category, while West Bengal and Goa have the smallest percentage in this category (5-6 per cent). Nearly 40-50 per cent women in Madhya Pradesh, Andhra Pradesh, Karnataka, Kerala and Bihar belong to the OBC category. Women who do not belong to any of the above three categories (SC/ST/OBC) form a very small percentage in Tamil Nadu (1.7 per cent) while in West Bengal, Delhi, Jammu and Kashmir and Goa as

Table 1: Per Cent Distribution of Women by Caste/Tribe in Different States, NFHS-2

State	Percentage of Women Belonging to			
	Scheduled Caste	Scheduled Tribe	Other Backward Caste	Other
India	18.5	8.8	33.2	39.5
<i>North</i>				
Delhi	18.2	0.9	15.6	65.3
Haryana	20.5	0.1	21.6	57.8
Himachal Pradesh	22.0	0.4	18.8	58.7
Jammu and Kashmir	12.5	2.6	10.9	74.0
Punjab	27.9	0.1	16.2	55.8
Rajasthan	17.5	12.4	22.9	47.2
<i>Central</i>				
Madhya Pradesh	15.1	22.7	41.3	20.9
Uttar Pradesh	20.4	2.2	29.2	48.2
<i>East</i>				
Assam	10.4	20.7	11.9	57.1
Bihar	20.7	8.3	51.8	19.2
Orissa	21.2	19.6	31.0	28.2
West Bengal	23.7	7.3	4.5	64.6
<i>West</i>				
Goa	7.5	0.2	6.3	86.0
Gujarat	14.8	19.8	23.9	41.5
Maharashtra	13.6	10.3	21.7	54.5
<i>South</i>				
Andhra Pradesh	19.8	4.8	44.3	31.0
Karnataka	16.3	5.8	41.8	36.0
Kerala	8.7	1.1	43.1	47.0
Tamil Nadu	23.3	0.8	74.2	1.7

high as 65-85 per cent belong to this category. Bihar and Madhya Pradesh are the two states where hardly 20 per cent women are in this category.

Socio-Economic, Health and Nutrition Inequalities among Caste/Tribe Categories

Table 2 presents the inequalities in the country as a whole with respect to eight indicators selected for analysis. Poverty as indicated by low SLI is the highest among SC and ST categories where nearly half the women come from households with low standard of living. On the contrary in the 'other' category hardly one-fifth of women are from low SLI households. Among OBC women, one-third are from such households. The same pattern – SC and ST in the most disadvantaged situation, 'others' in the best situation and OBC having middle position – is revealed also for the other seven indicators, but the inequality between the four categories for other six indicators is less than the inequality shown for SLI. The percentage of low SLI women among the most disadvantaged category (ST) is more than twice the percentage in the category which is in the best situation ('others'). For 'no media exposure', and 'no health facility within locality' percentage among ST women is about twice the percentage among 'others'. In case of 'illiteracy' the corresponding ratio is much less than 2:1. For 'no ANC', 'unsafe delivery' and 'low BMI' the corresponding ratio is 1.5:1 which suggests lesser disparity. The gap is the least in case of 'anaemia' where the percentage of anaemic women among the most disadvantaged category (ST) is less than 1.5 times the percentage in the best category, i e, 'other'.

Statewise data (not presented here) regarding disparities between four groups (SC, ST, OBC, 'others') reveals that disparities in terms of SLI, literacy and media exposure are much wider than disparities in terms of the two programme indicators (no ANC and unsafe delivery). Further, disparities in terms of two nutrition indicators are still less and even among these two indicators the most narrow range of variation is observed in case of anaemia. Many good performance states like Kerala, Tamil Nadu, Goa, and Himachal Pradesh have achieved near equality conditions as far as ANC is concerned. It suggests that programmes in these states have been able to bring even the most disadvantaged groups in the mainstream along with the most advanced groups to utilise ANC services. Kerala and Himachal Pradesh have achieved similar equality in terms of safe delivery. Andhra Pradesh in spite of having good performance in ANC reveals wide disparities between the four groups especially between ST women and 'other' women. In Assam and West Bengal, OBC women are observed to be in a better situation than the other three categories for

Table 2: Percentage of Women with Selected Socioeconomic, Health and Nutritional Indicators by Caste/tribe (NFHS-2, 1998-99)

Indicator	Scheduled Caste	Scheduled Tribe	Other Backward Caste	Other	All
Low SLI	50.2	53.9	32.3	20.3	32.8
Illiterate	72.8	78.9	60.8	43.8	57.9
No media exposure	48.2	61.8	40.6	30.9	40.1
No health facility within locality	42.4	58.1	40.3	31.2	38.7
No ANC	38.5	43.6	35.0	28.1	33.9
Unsafe delivery	63.0	77.0	55.0	51.0	57.2
Low BMI	42.6	46.6	36.2	30.8	36.1
Any anaemia	56.0	64.9	50.7	47.7	51.8

most of the indicators. Among all the states, Tamil Nadu reveals extreme disparities between SC women and women in 'others' category in terms of most indicators, i e, SLI, literacy, media exposure, unsafe delivery and BMI. In Tamil Nadu, only 5 per cent women in 'others' category belong to low SLI households, while among SC women the corresponding percentage is around 60. It should be mentioned, however, that according to NFHS-2, only 1.7 per cent women in Tamil Nadu were in 'others' category.

III State Ranks by Extent of Inequality among the Four Groups

It is essential to see which states are characterised by higher extent of inequality between four caste/tribe categories by using a comparable summary measure of inequality. Statewise values of $\sqrt{\chi^2/N}$ given in Table 3 for each of the eight indicators show whether there is a significant association between caste/tribe and the given indicator. If the value is statistically not significant, it implies that caste/tribe does not have any effect on that indicator and the situation with respect to that indicator is more or less the same in the four groups. If the value is significant but low it means caste/tribe has only a moderate effect on that indicator. If the value is statistically significant and high, it shows a strong correlation between caste/tribe and that indicator implying that caste/tribe does affect the dimension represented by that particular indicator and that the value of that indicator is high in certain castes/tribes and not in others. It is obvious that if there is notable inequality among castes regarding the dimensions reflected in these indicators, value of $\sqrt{\chi^2/N}$ is likely to be high and significant. Value which is not significant or significant but low can be taken as an indication of low inequality among four groups with respect to that particular indicator. In this sense, state ranks given in Tables 3a and b, represent the relative position of states by inequality between four groups regarding each of the eight indicators. The first rank shows the highest inequality while 11th rank shows the lowest inequality.

Gujarat, Orissa and Madhya Pradesh are characterised by extreme inequality among four groups with respect to economic condition (SLI) and education. In Assam, Maharashtra and West Bengal, there is more equality regarding SLI, i e, respondents with low SLI are not heavily concentrated in any of the four groups. In Maharashtra, Assam and Karnataka, inequality among four groups regarding education is low. It implies that caste/tribe has less effect on education and percentage of illiterates does not vary much between the four groups. Orissa, Madhya Pradesh and Bihar are the three states characterised by high inequality among four groups with respect to exposure to media. There is relatively much less disparity in this respect between four groups in Karnataka, Assam and Andhra Pradesh. The three states of West Bengal, Madhya Pradesh and Orissa reveal highest inequality between four groups regarding accessibility to health facility. It implies that some castes/tribes are concentrated in places which do not have health facility. In Bihar, Andhra Pradesh and Uttar Pradesh, however, people have almost the same access to health facility irrespective of the caste/tribe group to which they belong.

As regards the two programme related health indicators, Orissa, Madhya Pradesh and Andhra Pradesh reveal the highest inequality. It implies that respondents' caste/tribe has strong influence

on whether she receives antenatal care and professional assistance during delivery. On the contrary, in West Bengal, Rajasthan and Karnataka respondent's caste/tribe has the least influence on whether she receives ANC. It has resulted into the least inequality among four groups with respect to ANC in these three states. Similar situation prevails in Assam, West Bengal and Uttar Pradesh regarding assistance during delivery.

As for the two nutrition indicators, inequality between four groups regarding BMI is the highest in Gujarat, West Bengal and Orissa. It suggests that respondents with low BMI indicating poor nutritional status are concentrated in certain caste/tribe groups in these states. In Uttar Pradesh, Bihar and Assam, however, inequality in this respect is the least, i.e., respondents with poor nutritional status are not concentrated in any particular caste/tribe, they are more or less equally spread among the four groups. The other indicator of nutrition, i.e., prevalence of anaemia shows strong association with caste factor in Madhya Pradesh, Orissa and Bihar. It implies that anaemic women are concentrated in certain castes/tribes in these states and such inequality among four groups is the widest in these three states. The least disparity between four groups regarding prevalence of anaemia is found in Karnataka, Andhra Pradesh and Uttar Pradesh.

It is also interesting to see whether the states which reveal high inequality between the four caste/tribe groups with respect to socio-economic conditions are also the states which are characterised by high inequality between four groups with respect to health and nutrition indicators. Comparison of average ranks

for socio-economic indicators and for health and nutrition indicators given in the last column of Table 3a and 3b clearly shows that the three states, i.e., Orissa, Madhya Pradesh and Gujarat are characterised by high inequality between four groups regarding both socio-economic as well as health and nutrition indicators. In Assam, Uttar Pradesh and Karnataka, on the other hand the inequality is the least in both socio-economic as well as health and nutritional aspects. In both the groups, two states are less developed, poor performance states while one in each (Gujarat and Karnataka) is more developed, better performance state. In Gujarat and Karnataka hardly 13 per cent respondents have not received ANC and about 40-45 per cent have not received professional assistance during delivery. In Uttar Pradesh, about 65 per cent respondents have not received ANC and as high as 77 per cent had unsafe delivery. It suggests that inequality between four caste/tribe groups is not necessarily related to the overall development or performance of the state. It is rather a sorry state of affairs that in spite of good performance in terms of all indicators Gujarat has not been able to bring the disadvantaged groups in the mainstream and reduce the disparities between the four caste/tribe groups in terms of socio-economic and health and nutrition indicators. That is why it is in the same group as Orissa and Madhya Pradesh. Though Assam, Uttar Pradesh and Karnataka are in the same group, equality in Karnataka is a welcome feature because it shows that while improving the overall socio-economic and health-nutrition performance, Karnataka has been able to bring even the disadvantaged sections to the mainstream and reduce the gap between the four groups

Table 3a: Ranking of States by Extent of Inequality Between Caste/Tribe Groups and Different Socio-Economic Variables*, NFHS-2

State	SLI		Education		Exposure to Media		Whether Health Facility within Locality		
	Sqrt (χ^2/N)	Rank	Sqrt (χ^2/N)	Rank	Sqrt (χ^2/N)	Rank	Sqrt (χ^2/N)	Rank	Average Rank
Rajasthan	0.338	6	0.310	7	0.251	4	0.171	6	5.7
Madhya Pradesh	0.399	4	0.412	2	0.272	2	0.218	2	2.5
Uttar Pradesh	0.317	7	0.277	8	0.187	8	0.072	9	8.0
Assam	0.201	11	0.228	10	0.157	10	0.160	7	9.5
Bihar	0.393	5	0.326	5	0.266	3	0.057	11	6.0
Orissa	0.427	2	0.423	1	0.379	1	0.196	3	1.7
West Bengal	0.313	9	0.330	4	0.205	6	0.275	1	5.0
Gujarat	0.460	1	0.380	3	0.246	5	0.117	8	4.2
Maharashtra	0.267	10	0.215	11	0.194	7	0.186	5	8.2
Andhra Pradesh	0.409	3	0.319	6	0.176	9	0.067	10	7.0
Karnataka	0.315	8	0.248	9	0.153	11	0.195	4	8.0

Note: * The strength of association has been calculated by the index calculated as unweighted square root of χ^2/N . The states have been ranked according to the index giving rank 1 to the state with highest positive association and then in descending order. The socio-economic characteristics considered are standard of living (SLI), level of education, exposure to media; distance from health facility, the nutrition related variables are level of BMI and anaemia; and programme related variables are 'whether taken ANC' and 'whether a delivery was safe'.

Table 3b: Ranking of States by Extent of Inequality between Caste/Tribe Groups and Different Nutrition Related and Programme Related Variables*, NFHS-2

State	ANC		Safe Delivery		BMI		Anaemia		
	Sqrt (χ^2/N)	Rank	Sqrt (χ^2/N)	Rank	Sqrt (χ^2/N)	Rank	Sqrt (χ^2/N)	Rank	Average Rank
Rajasthan	0.091	10	0.165	8	0.102	8	0.089	7	8.2
Madhya Pradesh	0.229	2	0.268	2	0.135	5	0.173	1	2.5
Uttar Pradesh	0.152	6	0.156	9	0.080	11	0.064	9	8.7
Assam	0.152	6	0.135	11	0.099	9	0.084	8	8.5
Bihar	0.149	8	0.186	5	0.097	10	0.126	3	6.5
Orissa	0.231	1	0.275	1	0.154	3	0.147	2	1.7
West Bengal	0.081	11	0.146	10	0.164	2	0.117	4	6.7
Gujarat	0.172	5	0.222	4	0.252	1	0.100	6	4.0
Maharashtra	0.180	4	0.180	7	0.129	6	0.103	5	5.5
Andhra Pradesh	0.198	3	0.231	3	0.150	4	0.064	9	4.7
Karnataka	0.138	9	0.184	6	0.103	7	0.047	11	8.2

Note: Same as in Table 3a.

for most of the indicators. Equality in Uttar Pradesh and Assam, however, means that performance with respect to all the eight indicators is poor irrespective of caste/tribe group. It implies that even the more advanced castes have not been able to make much improvement with the result that there is no gap between four groups. This type of equality, which shows no signs of rapid change even in the better-off groups can rather be described as overall stagnation and not equality.

The remaining states are characterised by moderate inequality. Among them, Maharashtra, Rajasthan and Andhra Pradesh present interesting situations. Maharashtra is characterised by low inequality between four caste/tribe groups as far as the socio-economic indicators are concerned but the same is not true about health and nutrition indicators. As compared to socio-economic aspects, inequality with respect to health and nutrition indicators is higher. Andhra Pradesh also shows similar discrepancy between achievements of equality in terms of socio-economic aspects and in terms of health and nutrition indicators. It suggests that in spite of greater socio-economic equality between the four groups Maharashtra and Andhra Pradesh are lagging behind with respect to equality in health and nutrition. Opposite is the case of Rajasthan. In Rajasthan, degree of inequality between four caste groups with respect to health and nutrition indicators is lower as compared to inequality with respect to socio-economic indicators. It is interesting that in spite of higher socio-economic

inequality by caste/tribe, Rajasthan could achieve greater equality in health and nutrition.

IV Results of Logistic Regression

It is not enough to establish the association between caste/tribe factor and health and nutrition indicators. As discussed earlier, the association can be due to other attributes associated with caste such as poverty, illiteracy, etc. If higher percentage of SC or ST women do not get antenatal care, do not have the professional assistance during delivery, have a low BMI and are anaemic, it may not be due to their caste per se, it can be due to other reasons, e.g., they are likely to belong to households having low standard of living or they live in rural areas, or they do not have access to health facility or they are not exposed to media. It is essential to separate out the effect of caste/tribe factor adjusting the effect of these socio-economic factors on the health and nutrition situation. Results of logistic regression given in Tables 4 and 5 show the relationship between caste/tribe on the one hand and health and nutrition indicators on the other after adjusting the effect of age, rural/urban, residence, standard of living, education, exposure to media and access to health facility. 'Others' who are neither SC, ST nor OBC is the reference category. Odds ratio given in Tables 4 and 5 indicate the following scenario.

Table 4: Relationship between Caste/Tribe and Health Services Indicators – Results of Logistic Regression Analysis¹

State	Antenatal Care			Assistance during Delivery		
	Scheduled Caste	Scheduled Tribe	Other Backward Caste	Scheduled Caste	Scheduled Tribe	Other Backward Caste
Rajasthan	0.898	0.742*	0.849	1.165	1.147	0.836
Madhya Pradesh	1.080	1.961**	1.277	1.193	1.832**	1.120
Uttar Pradesh	0.990	1.848**	1.197*	0.985	1.480	1.238*
Assam	0.549*	1.205	0.585	0.687	0.655	0.488*
Bihar	1.454**	1.215	1.170	1.395*	4.145**	1.295*
Orissa	0.581*	1.391	0.598*	1.230	2.425**	1.167
West Bengal	0.456**	0.824	0.303	0.727**	1.342	0.605
Gujarat	1.419	2.001**	1.646*	0.842	1.503*	0.702*
Maharashtra	1.616*	2.631**	1.090	0.819	1.124	0.886
Andhra Pradesh	1.084	3.233**	1.349	0.885	3.088**	0.975
Karnataka	0.918	1.460	0.900	1.201	1.454	1.076

Notes: 1 The two dependent variables are: (i) whether a woman did not receive ANC (yes=1, no=0), and (ii) whether a delivery was unsafe (yes=1, no=0). For caste/tribe the reference category is 'other' caste. The regression coefficients (Exp β) have been shown only for the caste/tribe categories and not for the categories of the other predictor variables like education, exposure to media, the standard of living index, etc.

* Coefficient is statistically significant at 5 per cent level of significance.

** Coefficient is statistically significant at 1 per cent level of significance.

Table 5: Relationship between Caste/Tribe and Nutrition Indicators – Results of Logistic Regression Analysis¹

State	Body Mass Index			Anaemia		
	Scheduled Caste	Scheduled Tribe	Other Backward Caste	Scheduled Caste	Scheduled Tribe	Other Backward Caste
Rajasthan	1.397**	1.136	1.183*	0.941	1.449**	0.953
Madhya Pradesh	1.218*	1.656**	1.167	1.078	2.445**	1.240**
Uttar Pradesh	1.061	0.813	0.984	1.160	1.368	1.172*
Assam	0.760	0.472**	0.681*	0.795	0.674**	0.594**
Bihar	1.371**	1.055	1.072	1.075	2.416**	0.904
Orissa	1.304**	1.232	1.245*	1.290*	1.866**	1.161
West Bengal	1.041	1.464**	1.016	1.272**	2.372**	1.136
Gujarat	1.625**	1.831**	1.488**	1.041	1.252*	0.966
Maharashtra	1.063	1.350**	1.188*	1.209*	1.992**	1.142
Andhra Pradesh	1.184	0.970	1.236*	1.143	0.850	0.922
Karnataka	0.998	1.240	1.088	1.016	0.934	0.971

Notes: 1 The two dependent variables are: (i) whether a woman has a low BMI (yes=1, no=0), and (ii) whether a woman is anaemic (yes=1, no=0). For caste/tribe the reference category is 'other' caste. The regression coefficients (Exp β) have been shown only for the caste/tribe categories and not for the categories of the other predictor variables like education, exposure to media, the standard of living index, etc.

* Coefficient is statistically significant at 5 per cent level of significance.

** Coefficient is statistically significant at 1 per cent level of significance.

(a) Antenatal Care

Differentials between SC women and 'other' women regarding antenatal care disappear in most of the states after adjusting the effect of socio-economic factors. Interestingly differentials persist only in Maharashtra and four eastern states. Among them, in Orissa, West Bengal and Assam, SC woman is less likely to be without antenatal care as compared to a woman in 'other' category. Only in Maharashtra and Bihar, even after adjusting socio-economic factors, the odds of not taking ANC (ratio of women not taking ANC to those receiving) is nearly one and half times more among SC as compared to women in 'other' category.

Similarly differentials between OBC and 'other' women regarding antenatal care are mostly due to difference in the socio-economic conditions in all the states except Uttar Pradesh, Orissa and Gujarat. As compared to a woman in 'other' category OBC woman is more likely to be without antenatal care in Uttar Pradesh and much more so in Gujarat even after adjusting socio-economic conditions. In Orissa, however, OBC woman if in the same socio-economic situation as a woman in 'other' category is less likely to be without ANC.

Differentials between ST women and women in 'other' category in many states are striking even after adjusting socio-economic factors. In Andhra Pradesh, odds of not taking ANC is three times higher among ST women as compared to women in 'other' category. The corresponding odds ratio is 2.6 in Maharashtra, 2.0 in Gujarat and Madhya Pradesh and 1.8 in Uttar Pradesh. Only in Rajasthan, ST woman as compared to a woman in 'other' category is less likely to be without antenatal care. It could be that Rajasthan being a state with about 12 per cent ST population, the programme has taken specific care to focus on the tribes, and/or there are no cultural barriers as such which makes the ST women averse to taking ANC.

(b) Safe Delivery

Differentials between SC women and women in 'other' category regarding safe delivery mostly disappear once we adjust the effect of socio-economic factors, except in Bihar and West Bengal. In Bihar, even after adjusting the effect of socio-economic factors, SC women are more likely to go for delivery not assisted by health professional as compared to 'other' women. In West Bengal, however, the opposite is true as compared to 'other' women, SC women in similar socio-economic situation are less likely to go for unsafe delivery.

Given the same socio-economic situation, the odds of unsafe delivery (number of women going in for unsafe delivery to those who went for safe delivery) among OBC women is 1.2-1.3 times higher than women in 'other' category in Uttar Pradesh and Bihar. On the other hand, in Assam and Gujarat, OBC women are less likely to have unsafe delivery. In other states, differentials regarding safe delivery are mainly due to differences in socio-economic conditions and they disappear if socio-economic factors are adjusted.

As in case of ANC, even in this case differentials between ST women and 'other' women regarding unsafe delivery are very sharp in five out of 11 states. In Bihar and Andhra Pradesh, the odds of unsafe delivery is 3 to 4 times higher among ST women as compared to 'other' women. In the other three states, Gujarat, Madhya Pradesh and Orissa, the odd ratios are slightly less (varies between 1.5 to 2.4).

In short, the problem of differentials regarding unsafe delivery is most acute in Bihar where even after adjusting the effect of socio-economic conditions. SC, ST and OBC women are much more likely to go for unsafe delivery than 'other' women.

(c) BMI

In six out of 11 states under study, the differential between SC women and 'other' women regarding 'low BMI' are due to differences in socio-economic conditions and they disappear once the effect of socio-economic factors is adjusted. Rajasthan, Madhya Pradesh, Bihar, Orissa and Gujarat are the states where SC woman (even if she is in the same socio-economic condition as 'other' woman) is more likely to have low BMI. Especially in Gujarat it is much more likely than other states.

Differentials between OBC and 'other' women regarding BMI persist even after adjusting socio-economic factors in six states. In Rajasthan and Maharashtra, OBC women are slightly more likely to have low BMI than 'other' women while in Orissa, Andhra Pradesh and Gujarat they are much more likely to have low BMI than 'other' women. Interestingly, OBC women in Assam reveal different tendency. They are much less likely to have low BMI as compared to 'other' women.

The same pattern can be observed even for ST women in Assam. After adjusting the effect of socio-economic factors, they are less likely to have low BMI than 'other' women. This is strikingly different from ST women in Madhya Pradesh, West Bengal, Gujarat and Maharashtra who are more likely to have low BMI as compared to women in 'other' category.

(d) Anaemia

Differentials regarding anaemia prevalence between SC women and 'other' women totally disappear, after adjusting the effect of socio-economic factors in all states except in Orissa, West Bengal and Maharashtra. In these states, SC women are more likely to be anaemic than 'other' women even if we adjust the effect of difference in other socio-economic conditions.

Differentials between OBC women and 'other' women regarding anaemia prevalence persist even after adjusting the effect of socio-economic factors in only three states, viz, Madhya Pradesh, Uttar Pradesh and Assam. Here also Assam is strikingly different. In Madhya Pradesh and Uttar Pradesh, OBC women are more likely to be anaemic than women in 'other' category while in Assam they are less likely to be so.

Again, Assam is strikingly different from other states when we compare ST women and 'other' women regarding anaemia prevalence. Even ST women in Assam are less likely to be anaemic than 'other' women. On the contrary, in seven states, viz, Rajasthan, Madhya Pradesh, Bihar, Orissa, West Bengal, Gujarat and Maharashtra, ST women are more likely to be anaemic than women in 'other' category even after we adjust the effect of other socio-economic factors. In the remaining states, differentials regarding anaemia between SC, ST and OBC women and 'other' women are entirely due to other socio-economic factors and they disappear when effect of these factors is adjusted.

Conclusions

Analysis of differentials between four major groups in Indian society, presented in this paper has brought out the effect of social

stratification on utilisation of health care programmes and nutritional status. It clearly brings out that differentials between SC, ST, OBC women and women in 'other' category are partly due to difference in socio-economic conditions but in some states differentials persist even after adjusting the effect of socio-economic factors. It is interesting to see how far the situation regarding inequality by caste/tribe in less developed poor performance states is different from the situation in better-off states showing consistently good overall performance.

The situation in terms of demographic and socio-economic characteristics in the four larger northern states, namely, Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan is unfavourable. The level of fertility, with total fertility rate higher than four children, is still high there and so is infant mortality. The 1999 Sample Registration System (SRS) estimates of infant mortality rate ranges between 63 and 90 in these states. Among them, Madhya Pradesh shows very high level of inequality by caste/tribe in all the variables considered for the study. Uttar Pradesh and Rajasthan depict much less inequality. Once the socio-economic variables are taken into account (that is, for women with similar socio-economic background) there are not much differentials in the utilisation of ANC and the delivery services by caste/tribe in Rajasthan. Scheduled tribes in Rajasthan are, however, different than the three caste groups in their behaviour to utilise ANC. Surprisingly and unlike in other states, the tribal women here are more likely to utilise ANC services than either SC, OBC or 'other' caste women. Madhya Pradesh has a very high proportion of scheduled tribe women (Table 1) and scheduled tribes are generally the most disadvantaged group. Another noticeable thing is that in terms of socio-economic development, the 'other' caste group, in this state, occupies a better position, compared to similar caste in the other northern states. For example, 11 per cent of the 'other' caste group in Madhya Pradesh belong to low SLI, compared to 14, 18 and 28 per cent in Rajasthan, Uttar Pradesh and Bihar, respectively. Similarly, 40 per cent women in 'other' caste are illiterate as against 63, 57 and 51 per cent in the other three states. It is possible that at the initial stages of development, it percolates down to the relatively better off group and, therefore, the inequality tends to increase. Nevertheless, all these states badly require socio-economic development and also special efforts for improvement in nutritional status and utilisation of health programme with focus on SC/ST women.

The states like Maharashtra and Gujarat are doing relatively well in terms of socio-economic development. In terms of demographic situation also they are placed quite favourably. For example, the level of total fertility rate according to SRS (1999) in the two states is 2.5 and 3.0 children, as against 3.2 for all India. Similarly, the 1999 SRS estimates of level of IMR in the two states are 48 and 63, respectively, compared to 70 for all India.

The performance of the two southern states, namely, Andhra Pradesh and Karnataka in socio-economic development is not that satisfactory, particularly for Andhra Pradesh. But the programme has done quite well in the two states, and the level of fertility has declined considerably there. The level of total fertility rate is 2.4 in Andhra Pradesh and 2.5 in Karnataka according to the SRS (1999).

Among these four states, Gujarat is characterised by a high inequality, particularly in socio-economic variables. The inequality is much less in Maharashtra and Karnataka. For example, only 8 per cent of women in 'other' caste in Gujarat belonged to households with low SLI as against 45 per cent among the ST women.

With similar level of development, in Maharashtra the gap between the most and least advantaged groups are 25 per cent for 'other' caste and 58 per cent for ST women. It seems that the 'other' caste group in Gujarat has gained relatively more from development.

Karnataka shows the least inequality in the socio-economic variables. In terms of the utilisation of health programme and nutrition related variables, for women in similar socio-economic group, there is no inequality by caste/tribe in Karnataka. Women in Andhra Pradesh, except the scheduled tribes, are equally likely to go in for ANC or have safe delivery, compared to similar socio-economic group women belonging to any caste. The scheduled tribe women are less likely to avail these maternal services. It may be mentioned, however, that the proportion of scheduled tribe women (eligible women in age 15-49) in Andhra Pradesh, according to NFHS-2, is less than 5 per cent.

The remaining three states in the eastern region, namely, Assam, West Bengal and Orissa are in different stages of socio-economic development and demographic transition. The situation is relatively better in West Bengal. Orissa has done better in fertility reduction than many other states, but it is one of the poorest states in India and mortality, particularly infant and child mortality is substantially high there.

In terms of SLI, the inequality is quite low in West Bengal. In fact, it occupies ninth rank among the 11 states considered. Inequality is not that low in West Bengal when we consider the other variables in the socio-economic development. The extent of inequality is highest in this state in terms of availability of health facility within locality. The per cent of 'other' women staying in locality with no health facility is 27 as against 70 per cent among ST women. Orissa shows very high inequality in socio-economic variables, and Assam shows the least inequality.

The situation in Assam is particularly noticeable. For similar socio-economic characteristics, as compared to other group of women, in Assam (i) SC women are less likely to be without ANC; (ii) OBC women in Assam are less likely to have unsafe delivery, less likely to have low BMI, and less likely to be anaemic; (iii) ST women in Assam are less likely to have low BMI and are less likely to be anaemic. One wonders whether this is due to the work done by Christian missionaries in the northeastern part of India. Similar pattern is also observed even for Orissa and West Bengal for SC women who are less likely to go without ANC than 'other' women. In West Bengal, SC women are also less likely to have unsafe delivery as compared to 'other' women, after adjusting the effect of socio-economic factors. One needs to investigate further why SCs and STs in this region tend to behave differently. For similar socio-economic characteristics, SCs and STs are likely to have better nutrition and are more likely to utilise the programme services, compared to women of other groups. ■■■

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