Health Inequality in India: Evidence from NFHS 3

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This article utilises the National Family Health Survey-3 data and presents an empirical assessment of income-related health inequality in India. It undertakes a state-level analysis of inequities in child health by employing the widely accepted measures of concentration curves and concentration indices. It finds that the poorer sections of the population are beleaguered with ill health whether in the quest for child survival or due to anxieties pertaining to child nutrition. Further, an attempt is made to comprehend the relationship between income inequality and health status in the Indian context. The analysis reveals that the degree of health inequalities escalates when the rising average income levels of the population are accompanied by rising income inequalities. The income-poor sections have different needs and therefore, planning and intervention necessitates an understanding of the sources of inequality and recognition of the vulnerable groups to arrive at efficient resource allocation and policy decisions.

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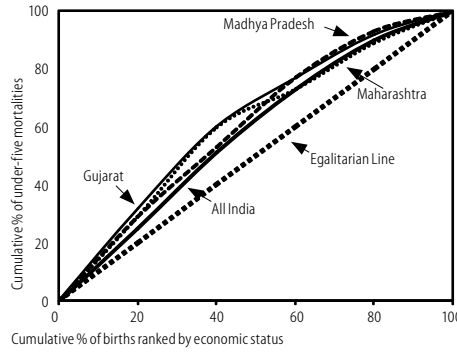
Recent research has witnessed considerable engagement with the task of comprehending the crucial determinants of health outcomes. It is observed that the burden of ill health is borne disproportionately by different population subgroups and that people of lower socio-economic status consistently experience poor health outcomes [Macinko et al 2003]. Several empirical studies have also acknowledged such income-related inequalities in health, propounded as the absolute income hypothesis [Kakwani et al 1997; van Doorslaer et al 1997: Humphries and van Doorslaer 2000]. In view of such findings, health promotion of the poor has emerged worldwide as a vital area for policy research and action. Policy initiatives and programmes strongly perceive that inequalities in the health outcomes of different population subgroups are characterised by certain systematic deprivations (such as poverty).

Apparently, some of the Indian health policies and programmes also attempt to eliminate deprivation in the provisioning of healthcare and achieve the objective of health equity.[1] In order to achieve this objective, it is important to steer policymaking through timely and systematic assessment of prevailing health inequality,[2] a task that so far does not seem to have received serious attention. Although a few studies have presented region-specific or population-subgroup-related health profiles for India, they are at best able only to reflect on disparities and not inequalities. While disparities are evaluated based on the positioning around aggregate outcome, inequalities have to be adjudged according to specific ethical or economic ideals. Moreover, for ensuring equitable and efficient allocation of public health resources, it is imperative to unravel the depth and the varied dimensions of health outcomes, especially through measures sensitised for equity concerns. Apart from these considerations, it is also of analytical interest to examine whether income inequality itself poses as a public health hazard. This question has gained much academic attention but most of the findings of studies[3] on the topic have remained inconclusive. The literature on health economics, which identifies this question as the relative income hypothesis states that the distribution of income in a society has a larger impact on population's health than absolute income. Since most of the studies on relative income hypothesis are undertaken in the context of developed countries, it would be worthwhile to gather some insights from the Indian experience to further our understanding of the income-health nexus.

In this article, we employ widely accepted measurement techniques to assess inequities in child health across different Indian states and draw some interesting conclusions on the relationship between income inequality and health inequality in the country. As we all know, health of children assumes

significance for human and economic development of any country; but what is more important is to regard it as their right to survival, protection, participation and development as ratified by the government of India in 1989 through the Convention on the Rights of the Child (CRC) drafted by the United Nations Commission on Human Rights. Unfortunately, most of the deaths rampant among children in India are preventable and are caused by a combination of under-nourishment and onslaught of infectious diseases. Although, child health and welfare has been a prime item in the agenda of the central and the state governments, their intent cannot proceed very far in the absence of a prior assessment of the magnitude and varied dimensions of the problem. With the motivation to fill this void, the rest of the paper is organised as follows. Section 1 discusses the measurement techniques employed to measure the magnitude of disparities in child health status. Section 2 briefs about the data sources and the variables identified for the analysis. Section 3 presents the empirical findings obtained for the income-related dimension of health inequality and section 4 attempts to interpret the results theoretically. Section 5 concludes the discussion and presents a few policy suggestions.

Figure 1: Under-Five Mortality Concentration Curves



1 Methods

As we already argued, the assessment of health status could be improved by adopting certain distribution-sensitised measures along the identified dimensions. In order to examine income-related inequality, we adopt the standard technique of employing concentration curves and concentration indices. Underlying this technique is a simple but interesting principle of defining equity. The principle involved stipulates that the cumulative proportions of ill health must match with the cumulative population shares and any mismatch between the two sets is defined as inequity. The concentration curve (CC) and concentration index (CI) have certain attractive properties compared to certain other measures of health disparities [Wagstaff et al 1991, Kakwani et al 1997] and are employed here as a means for quantifying the degree of income-related inequality in certain specific health variables. The CC plots the cumulative proportions of the population (beginning with the most disadvantaged in terms of income and ending with the least disadvantaged) along the x-axis against the cumulative proportions of ill health plotted on the y-axis. For interpretative purposes, if the burden of ill health were equally distributed across socio-economic groups, the CC would coincide with the diagonal. If poor health is concentrated in the lower socio-economic groups, the health CC would lie above the diagonal and the farther the CC lies from the diagonal, the greater would be the degree of inequality. The CI is defined as twice the area between the CC and the diagonal. The CI provides a measure of the extent of inequalities in health status that are systematically associated with socio-economic status. The CI can be easily computed by making use of the convenient covariance result [Kakwani 1980; Jenkins 1988; Lerman and Yitzhaki 1989] as follows:

$$CI = 2\,cov\,(H_i, R_i)/\mu,$$

where H is the health variable whose inequality is being measured, μ is its mean, R_i is the i^{th} individual's fractional rank in the socio-economic distribution and $cov(H_i, R_i,.)$ is the covariance. The CI ranges between +1 and -1 and takes negative values when the CC lies above the line of equality, indicating disproportionate concentration of the ill health outcome among the poor.

Table 1: Definitions of Child Health Indicators Used

Under-five mortality rate (U5MR)	The number of deaths to children under five years of age per 1,000 live births. Figures are based on births during the five years preceding the survey.
Stunting (H/A)	Children whose height-for age is below minus two standard deviations (-2 SD) from the median of the reference population, are considered short for their age, or stunted.
Underweight (W/A)	Children whose weight-for-age measures are below minus two standard deviations (-2 SD) from the median of the reference population are underweight for their age.
Prevalence of anaemia(ANE)	Children between six months and 59 months are classified as anaemic if the haemoglobin concentration in them is found to be lower than 11.0 g/dl.
Not fully immunised (NFI)	A child (12-23 months) is considered not fully immunised if the child has not received any one of the following vaccinations, namely; BCG, a measles vaccination, three DPT vaccinations, and three polio vaccinations.

2 Data and Variables

Notwithstanding the measurement techniques, availability of health information disaggregated by population groups becomes crucial in evaluating health inequities. Prior to the advent of the National Family Health Surveys (NFHS), health information was restricted to aggregate measures and it had been difficult to study the distribution pattern of health in the population. The genesis of the NFHS, its wide coverage and the nature of information collected offer an exclusive opportunity to employ robust measures to comprehend health disparities across the Indian union. In order to portray the status of health deprivation in India and its spatial and group related dispersal, we utilise the unit level records of the third and the latest round of NFHS (2005-06), conducted by the International Institute for Population Sciences and ORC Macro. To retain the sensitivity of the health outcome indicators, the domain of child health has been taken as a major criterion as it allows for better interventions right from the preliminary stages of life. Therefore, in our analysis we engage ourselves with child health outcome variables, across different states of the Indian union.

As the key indicators of child health, this paper employs the information available on under-five mortalities, immunisation status and nutritional performance (stunting and underweight) of the child population of the different states. For measuring the inequities in child undernutrition, we use the NFHS 3 information

provided on the basis of the new international reference population released by World Health Organisation (WHO) in April 2006 [WHO Multicentre Growth Reference Study Group 2006] and accepted by the government of India [IIPS and ORC Macro 2007]. All these variables are specifically defined in Table 1 (p 42). To focus attention on issues of association and causation, we have obtained information also on three other economic variables: One, the state-wise net state domestic product (NSDP) 2004-05 at factor cost, which is obtained through the statistics published by Central Statistics Organisation (CSO). The second is the information on public spending on health as a share of total health spending, which is taken from Rao et al (2005). In addition to these variables we also required information on the income inequality levels across different Indian states. For this purpose we have used the unit level records of National Sample Survey's (NSS) 61st round on consumer expenditure. Here, the consumption expenditure of the households is taken as a proxy for income and we have computed the Gini coefficient of inequality in per capita monthly consumption expenditure for all the states of India.

3 Interstate Differences in Health Inequalities

In this section, we examine the magnitude of income-related inequalities in health, across the different Indian states. For this purpose, we have computed the CI for the selected indicators of child health across all the Indian states (Table 2). The CI values for a range of child health indicators for the country as a whole are negative, confirming the prevalence of income-related health inequalities that are manifest primarily among the poor. On comparison of these inequalities across varied indicators of child health, inequalities are more pronounced in the case of the under-five mortalities, in undernutrition and the receipt of basic vaccinations for immunisation. The under-five mortality CC for all-India as well as for three other major states (Maharashtra, Gujarat and Madhya Pradesh) with higher health inequality levels are shown in Figure 1 (p 42). All these CCs lie above the diagonal and thus, indicate a greater concentration of health eventualities among the poorer groups.

While the CI value for under-five mortality at the national level is computed to be (-0.1582), it presents a reasonably wide range across various states with the minimum of (-0.0388) in West Bengal and maximum of (-0.4107) in Uttaranchal. Among the other major states, Maharashtra, Madhya Pradesh, Gujarat, Tamil Nadu and Punjab experience greater income-related inequalities in under-five mortality as against the states of Uttar Pradesh, Rajasthan and Bihar, which show much lower levels of inequalities. Apart from the differences in the magnitude of inequalities across the board, the negative values indicate vulnerabilities among the poor.

Other than under-five mortality, similar inequality is assessed for a set of child health indicators, which include nutritional make-up, anaemia and child immunisation. As regards nutritional make-up, the two dimensions namely stunting (low height-for-age) and the underweight (low weight-for-age) manifest inequalities at the all-India level ranging between (-0.1249) and (-0.1600). The all-India level inequality in weight-for-age based nutritional assessment being the largest depicts a similar pattern across states as well. Compared with stunting, the inequality in nutrition according to the underweight criterion has a wider range between (-0.0835) in Madhya Pradesh and (-0.3063) in Goa. The level of overall prevalence of the same could also condition a moderate range of inequality across states for the alternative nutritional measures. This is obvious from the fact that prevalence of undernutrition according to the underweight criterion is by far the largest when contrasted with the same evaluated on an alternative criterion like stunting. Further, weight-for-age in its own construct has a propensity for larger variation during childhood. As regards stunting the all-India concentration index value is (-0.1249) with a variation range of (-0.0325) in Meghalaya and (-0.2867) in Goa. Not only is the range of variation in this inequality measure relatively lower compared to the same according to the underweight criterion but also the high inequality magnitudes are lesser in this case.

Table 2: CI for Inequalities in Child Health Indicators

States	CIU5MR	CIANE	CIH/A	CIW/A	CINFI
Andhra Pradesh	-0.0704	-0.0367	-0.1311	-0.1650	-0.0963
Arunachal Pradesh	-0.1401	-0.0587	-0.1167	-0.1816	-0.1296
Assam	-0.0541	-0.0581	-0.1302	-0.1373	-0.1079
Bihar	-0.0882	-0.0389	-0.0861	-0.0962	-0.1340
Chhattisgarh	-0.0764	-0.0389	-0.0669	-0.1133	-0.1443
Delhi	-0.1835	-0.0666	-0.1313	-0.1410	-0.2079
Goa	-0.1282	-0.1126	-0.2867	-0.3063	-0.2893
Gujarat	-0.2198	-0.0658	-0.1127	-0.1432	-0.1542
Haryana	-0.1304	-0.0524	-0.1408	-0.1260	-0.3341
Himachal Pradesh	-0.2186	-0.0406	-0.1305	-0.1323	-0.1589
Jammu and Kashmir	-0.1656	-0.0169	-0.1690	-0.2258	-0.2341
Jharkhand	-0.0546	-0.0624	-0.0803	-0.0876	-0.1131
Karnataka	-0.1325	-0.0339	-0.1284	-0.1648	-0.1823
Kerala	-0.1274	-0.0314	-0.1628	-0.2026	-0.2719
Madhya Pradesh	-0.2081	-0.0406	-0.0683	-0.0835	-0.1810
Maharashtra	-0.2481	-0.0444	-0.1427	-0.1796	-0.1795
Manipur	-0.3458	-0.0097	-0.1409	-0.1805	-0.1975
Meghalaya	-0.1152	-0.0525	-0.0325	-0.0811	-0.0957
Mizoram	-0.1942	-0.1363	-0.1606	-0.2400	-0.2130
Nagaland	-0.1646	NA	-0.1328	-0.1645	-0.1113
Orissa	-0.0844	-0.0827	-0.1865	-0.1811	-0.1328
Punjab	-0.1688	-0.0331	-0.2082	-0.2597	-0.2505
Rajasthan	-0.0801	-0.0198	-0.1043	-0.1337	-0.0898
Sikkim	-0.0581	-0.0171	-0.0848	0.0200	-0.0725
Tamil Nadu	-0.1749	-0.0346	-0.1463	-0.1936	-0.0523
Tripura	-0.2251	-0.0381	-0.1113	-0.1421	-0.2306
Uttar Pradesh	-0.0960	-0.0271	-0.0885	-0.1181	-0.0754
Uttaranchal	-0.4107	-0.0710	-0.1924	-0.1997	-0.2302
West Bengal	-0.0388	-0.0919	-0.1716	-0.1660	-0.1231
All India	-0.1582	-0.0518	-0.1249	-0.1600	-0.1595

The CI ranges between +1 and -1 and takes negative (positive) values when the ill health outcomes are concentrated among the poor (rich).
CIU5MR- (CI) for under-five mortality, CIANE- CI for anaemia, CIH/A- CI for stunting, CIW/A- CI for underweight and CINFI- CI for not fully immunised.
Source: Computed by authors using NFHS 3 (2005-06) unit level records.

For the indicator of anaemia the all-India CI value of (-0.0518) is observably lower and could be due to the widespread prevalence of anaemia across the population but still the poorer sections are found to remain at a higher disadvantage. The inequities in child-anaemia do not vary significantly across the major states. However, the states of Mizoram (-0.1,363), Goa (-0.1,126), West Bengal (-0.0919) and Orissa (-0.0851) are found to be more inequitable. In addition to these health outcome

indicators, we have also tried to examine whether income-related inequities are present in the attainment of basic vaccinations, which is provided through the public health machinery. Apart from the problem of lower rates of complete immunisation, there are evidently higher income-related inequities inherent in the distribution of non-immunised children across different states. Even in states with better coverage of primary healthcare (like Kerala), children belonging to poorer sections of the population are at a greater disadvantage as the concentration of these incomplete immunisations is higher among them. Undoubtedly, apart from income, inequality in such outcomes is arising due to the interplay of several factors including education and health awareness and it would be an important and challenging task to probe into inequalities obtained due to reasons other than the elementary issue of income deprivation.

After providing a preliminary account of income-related child health inequality in India, we now turn to discuss the relationship between health inequalities and income across different Indian states. To facilitate the discussion, we have classified the different states into four categories (Table 3). Employing the all-India figures of per capita NSDP (for income) and CI for under-five mortalities (for health inequality)[4] as a cut-off level, the states are classified into "low income – low health inequality", "low income – high health inequality", "high income – low health inequality" and "high income – high health inequality" ones depending on whether their respective values exceed or fall short of the cut-off level. On this basis we are able to obtain vital insights into the relationship between the magnitudes of inequalities in health and the state's income profile. States like Punjab, Maharashtra and Gujarat demonstrate the coexistence of higher levels of income along with higher levels of inequalities in under-five mortalities and states such as Uttar Pradesh, Bihar and Orissa which have lower income levels are also found to have lower levels of inequalities in under-five mortalities. These states suggest, that there is a straightforward relationship between income levels and health inequality. But there are other states such as Madhya Pradesh, Karnataka and Kerala, which are exceptions to such a relationship and suggest there is no such clear-cut relation.

Table 3: Classification according to Income Levels and Health Inequality

	Lower Health Inequality	Higher Health Inequality
Lower income	Arunachal Pradesh, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Meghalaya, Orissa, Rajasthan, Uttar Pradesh, West Bengal	Jammu and Kashmir, Madhya Pradesh Manipur, Mizoram, Nagaland, Tripura, Uttaranchal
Higher income	Haryana, Goa, Karnataka, Kerala, Sikkim	Delhi, Gujarat, Himachal Pradesh, Maharashtra, Punjab, Tamil Nadu

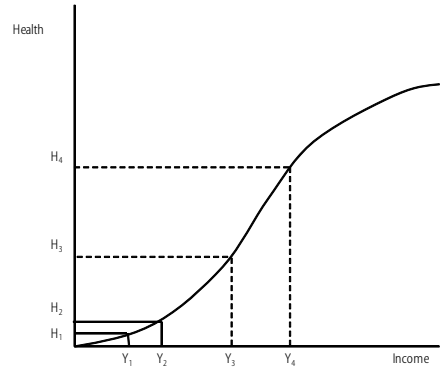
For income, per capita NSDP (2004-05, at factor cost) and for health inequality, CI of under-five mortalities are used with their all-India levels employed as a cut off mark to classify the states into low and high categories.

To probe further, we bring in the element of income inequalities to comprehend the observed health inequities across these states. Inclusion of income inequality[5] into the analysis would signify that the health inequality in a state is not only dependent on the overall level of income but also on its distribution. This too is not sufficient to explain the observed pattern of health inequalities across different states. For example, consider major states such as Kerala and Madhya Pradesh, which are exception to any such direct relationship. Both these states have higher levels of income inequalities coupled with varying levels of income and health inequality (lower in Kerala and higher in Madhya Pradesh). Therefore, without asserting association any further, we present a simple model to better elucidate the expected relationship between the two.

4 Income Inequality and Health Inequality

To understand health inequality through the income domain, we adopt a simple model discussed in Wagstaff (2002, 1986). In this model, the relationship between health and medical care is assumed to be concave, meaning that medical care is subject to diminishing returns in the production of health. It suggests that richer individuals are likely to end up with higher levels of health and that increases in income inequality result in higher levels of health inequality. Further, it is inferred that if medical care is subsidised through public spending, it helps to lower the levels of health inequality. It also suggests increases in health inequality if rising incomes are accompanied by technological improvements in healthcare. In order to verify these predictions from the model, an empirical analysis has also been attempted. This exercise shows that neither income inequality nor the public share of health spending proves to be a significant determinant of health inequities but that average income of the population is significant in determining the same. However, such findings raise the question as to why these empirical findings differ from the theoretical insights offered by the model. For instance, why are rising levels of income inequalities not accompanied with higher levels of health inequality? In fact, the interstate analysis to be discussed later also provides us with similar results (Table 4, p 45). Does it imply that the supposedly strict concave relationship between health and medical care is weak?

Figure 2: Income-Health Relationship



To explore further, we modify the assumption of a strictly concave relationship between income and health and instead work with a convex-concave relationship (as shown in Figure 2) between income and health. This modified assumption helps to elucidate relationship between health and medical care expenditure – particularly in a developing country – by capturing the indivisible nature of health expenditure and to comprehend health inequality in a striking manner. What motivated us to engage with such a relationship are the facts that in a developing country whenever an individual decides to seek medical care, his first task would be to arrange for an array of healthcare-related expenses beginning from travelling cost and medical fees. Also, during the initial phases of the treatment process, often, the individual is advised to undergo a few diagnostic tests,

which undoubtedly help detect the ailment accurately but importantly require additional expenditure. It must be noticed that many such expenses are indivisible and unavoidable under conditions of feeble health systems as is the case in many developing countries. Such specific difficulties in accessing quality medical care provide inadequate (or lower) returns to health at low levels of income. This line of reasoning is conceived in terms of the initial convex region of the income-health function depicted in Figure 2.

Table 4: Regression Results for CIs of Under-Five Mortality

Variable	Model 1 Parameter (t-statistics)	Model 2 Parameter (t-statistics)	Model 3 Parameter (t-statistics)
Constant	0.076 (0.992)	0.080 (0.920)	0.048 (1.482)
Gini coefficient	0.183 (0.767)	0.160 (-.0546)	
NSDP per capita		9.49E-06** (2.429)	
Public spending on health as % total		-0.00012 (-0.124)	
Avg of Gini and normalised NSDP per capita			0.211*** (2.894)
F statistic for model	0.588	2.438*	8.378***
R-squared	0.024	0.249	0.267
Adjusted R-squared	-0.017	0.147	0.235
N	26	26	25

*** Significant at the 1% level, ** significant at the 5% level.

Under such a framework, richer individuals are likely to end up with higher levels of health but it also suggests that individual incomes have to exceed a certain threshold (somewhere close to Y_3) to able to meet the initial expenditure requirements for medical care in order to reap greater health benefits. For instance, consider two individuals with incomes Y_1 and Y_2 respectively as shown in Figure 2. In the absolute sense, both these incomes are low and thus, lead to low levels of health. But still, there exists a certain degree of income inequality between these individuals (absolute and relative income inequality, given by $Y_2 - Y_1$, Y_2/Y_1) that leads to health inequalities (given by $H_2 - H_1$, H_2/H_1). It is important to note that the inequalities in health, both in absolute and relative senses, are smaller than the inequalities observed in the income distribution and suggest that at lower levels of income, health inequalities are also low. But if individuals are around the threshold income level beyond which they would be able to afford better healthcare, then the relationship between income and health inequalities worsens. To demonstrate this fact, consider two individuals with incomes Y_3 and Y_4 respectively and allow for a considerable degree of income inequality between them (i e, $Y_4 - Y_3$, Y_4/Y_3). Here, unlike in the earlier case, we observe that despite similar degrees of income inequalities, the level of health inequality ($H_4 - H_3$, H_4/H_3) has increased with increase in incomes.

In a nutshell, the modification of the income-health function allows one to infer that for a given level of income inequality, if overall income levels are lower (higher) then health inequalities are also lower (higher). It also suggests that the levels of income inequality also have significant bearing upon the extent of health inequality but that the impact becomes more observable if the income inequalities are associated with higher levels of income. More importantly, under conditions of lower incomes and high-income inequality, the health inequality levels would get enhanced whereas if income levels are higher and income inequality levels are low, they would have a moderating impact on health inequality levels. Another related discussion that is relevant here is the impact of public health spending upon health inequality. Although it is desirable that such facilities should be distributed more evenly across the population, the actual result may be undesirable as health facilities provided through public health spending often tend to be concentrated in particular regions such as urban areas or certain other target-locations thereby, often failing in guaranteeing universal access and opportunity. Any such bias in the provisioning of public health could thus worsen the distribution of health across individuals.

In order to quickly verify the predictions of these two different frameworks in the Indian context, a simple regression exercise is undertaken here. This analysis could also be viewed as a preliminary attempt to comprehend the differences in health inequality across the different states of India in terms of income inequality, per capita income and share of public health spending. We have selected the negative of the under-five mortality CI as an indicator of child health inequality. As explanatory variables, the Gini measure of inequality in per capita monthly consumption expenditure is taken as a proxy for income inequality, per capita NSDP at factor cost is utilised to represent the state per capita income and public spending on health as a share of total health spending is taken to represent the role of subsidies in healthcare. The results from the regression analysis are presented in Table 4.

Model 1 shows that in the Indian context, income inequality is positively but insignificantly related with levels of health inequality. The R-squared value suggests that hardly 2 per cent of the variations in health inequality are actually explained by the differences in income inequalities. This finding is similar to what Wagstaff (2002) finds while comprehending the differences in health inequality across developing countries. Given the inability of income inequality alone to capture the variations in health inequality, we add other important variables to comprehend the causation. Specifically, in model 2 we control for income inequality and public health spending levels and thereby attempt to elicit the role of per capita income in determining health inequalities. The results endorse the view that increases in average income also increase the levels of health inequality as indicated by the positive and significant coefficient of NSDP per capita. The theoretical framework discussed earlier has predicted this relationship. However, it is also observed that the coefficient obtained for the variable of public health spending as a proportion of total health spending possesses a negative sign, suggesting its favourable effect for reducing health inequalities. However, the effect turns out to be statistically insignificant.

The overall results obtained here (in models 1 and 2), especially in relation to income inequality and average income, are partly in agreement with the framework but do not lend any concrete support to the relative income hypothesis. In other words, it may also be opined that the concave relationship between income and health is somewhat unable to capture the conditions prevalent in developing countries. Hence, now we go on to test the alternate framework namely of the convex-concave relationship between

health and income. What is necessary here is to conceive of a variable, which should be sensitive to both, average income levels as well as income inequality levels. For this purpose we develop a simple composite index of income and income inequality in two small steps as follows. Firstly, we normalise the NSDP per capita across the states in such a way that the state with the highest income obtains a value of one and the lowest-income state is assigned a value of zero. In the second step, we obtain the composite index for each state, by taking a simple average of the Gini coefficient for the state and the normalised NSDP per capita values for the respective states obtained through the previous step. This new index represents the relative levels of both income and income inequality and is used as an explanatory variable in the analysis to comprehend health inequality.

Model 3 finds that this new composite index measure given by the average of the Gini and normalised NSDP per capita turns out to be a statistically significant factor explaining the variations in health inequality with an explanatory power of 27 per cent, greater than that of the previous two models. Besides, the coefficient value too is higher (0.211) which is statistically significant at the 1 per cent level of significance. This result supports the theoretical prediction that if higher levels of average incomes are accompanied by higher income inequalities then it leads to increase in health inequality. Further, effects on health inequality get cushioned if either the distribution of income is more equitable or if the average income levels are lower. Although here we have not performed a rigorous analysis of the said framework, this exercise could be considered as a preliminary attempt at gauging the proposed health-income relationship. Undoubtedly, a more comprehensive examination would be able to help draw further insights because income alone is insufficient to describe the larger variations observed in health inequity, as is evident from the explanatory power of the regression.

5 Policy Notes and Conclusion

We shall begin this concluding section by reiterating the motivation behind this present engagement. The concern beneath this empirical exercise is the sheer urgency to unravel the inadequacies of the summary measures in vogue of health outcomes and to evoke policy concerns pertaining to social justice and equity. It is disconcerting to witness, especially from an ethical perspective, that poorer populations in India are bearing the brunt of health disadvantages. Although certain policy interventions are in place to deal with such adversities, greater attention needs to be directed towards the assessment of health deprivation and inequities in India. Also, we would like to stress upon the recognition of differential constraints in accessing medical care across regions. For instance, for some, availability may be an issue while for others it may not actually be the major worry. Similarly, availability alone may not be sufficient; unless it is supported by a policy of greater subsidisation of health facilities through special schemes for maternal and child healthcare. The problem may as well be one of poor levels of awareness for some others. Given such possibilities, the social planner has to acquire

more complete information with regard to the sources of inequality and identification of the vulnerable groups. Undoubtedly, such an exercise would go a long way to optimise resource allocation and enhance the targeting efficiency of such interventions. The present analysis pursues this thinking and endeavours to enhance the informational base for policymaking, by incorporating into the summary measures, a slightly more elaborate account of health inequality caused by a factor such as income inadequacy.

While analysing the income component, it was observed that poorer sections of the population were beleaguered with ill-health whether it be their efforts for child survival or anxieties pertaining to child nutrition. Another highlight worth mentioning here relates to the inequality levels being higher with higher levels of the event as against lower levels. Undoubtedly from a policy perspective, focused attention needs to be paid towards improving the mortality situation in backward states and perhaps inequality aversion measures need to be promoted in states like Maharashtra and Gujarat with lower under-five mortality rates (of 47 and 61 per 1,000 live births respectively) in order to obviate the concentration of this misfortune among the poor. Further, a simple theoretical model was resorted to comprehend associational and causational factors. The analysis revealed that the degree of health inequalities escalates when the rising average income levels of the population are accompanied by greater income inequalities. On the one hand, such an association does reflect that the product of economic growth in the form of rising average income and income inequalities presents certain impediments to attaining equitable health by allowing the better-off population to secure greater benefits of the growth process. On the other hand, it is also evident that the summary measures of health also improve with the betterment of the income profile of a region. The interplay of these two impacts may actually help policymakers trade off a little bit of health inequality for gaining higher health levels. However, a social planner needs to sail through such quandaries and should arrive at prudent mechanisms to utilise the resources and technology obtained through economic growth, by allocating greater resources towards those sections of the population who have been excluded from the growth process [Wagstaff 2002]. Even the countries with the shallowest health gradients, such as Sweden and England, have viewed their own health inequalities as unacceptable and have initiated policy measures to mitigate those [Daniels et al 2000].

We now turn to the larger question, namely, the one relating to the type of social policies that could be pursued by the state to reduce health inequalities. Scholars have advocated for a policy matrix, which not only accommodates immediate or direct health interventions such as medical facilities but also consists of basic interventions indirectly related with the health of individuals. Such investments are largely sought in the form of investment in basic education, better housing, water and sanitary conditions as well as the introduction of programmes to provide income security. By suggesting a holistic policy matrix, our contention here is not as much to argue for allocation of resources but rather to suggest an exercise that would integrate these basic investments, at least, at an analytical level while arriving at resource allocation decisions for the health sector itself. Decisions on resource allocations for public health, taken in isolation from other pertinent factors, may actually affect the efficacy of the policy matrix in toto. Perhaps the state should acknowledge the fact that social sector expenditures, particularly on health and education, are complementary in nature and if put together do produce large individual as well as social benefits.

NOTES

1 Equity as defined by the International Society for Equity in Health is: "The absence of potentially remediable, systematic differences in one or more aspects of health across socially, economically, demographically, or geographically defined population groups or subgroups".

2 Recently, the World Bank, in cooperation with the Dutch and Swedish governments, has sponsored a set of reports providing basic information about health inequalities within countries. As a result of this collective initiative, the basic information (for 1992/93 and 1998/99) about health, nutrition and population inequalities is published in the report on India [Gwatkin et al 2007].

3 Wagstaff and van Doorslaer (2000) conducted a literature review of individual level studies on the impact of income inequality on health. In their review of six major studies, they found that the literature reveals strong support for the absolute income hypothesis and little or no support for the relative income hypothesis. Also see Macinko et al (2003).

4 Correlation matrices for the CIs obtained through Pearson correlations and Spearman's rank correlation suggest that there are high and significant correlations between the CIs for these indicators. The CIs for the indicators of inequalities in under-five mortalities are significantly correlated with the indicators of malnourishment and with the inequities in incomplete immunisation. In other words, states with a high level of inequality in under-five mortality consistently have high levels of inequality on the other indicators.

5 As discussed in Section 2, the consumption expenditure of the households is taken as a proxy for income and we have computed the Gini coefficient of inequality in per capita monthly consumption expenditure for all the states of India using unit level records of the NSS 61st round on consumer expenditure.

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