CHAPTER SEVEN

SUMMARY AND CONCLUSION

'Measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness about the social determinants of health.'

- Commission on Social Determinants of Health, 2008

7.1. MEASUREMENT OF HEALTH INEQUALITY: THE RESEARCH PROBLEM

Measurement of health inequality has two fundamental objectives; one, to compare the distribution of the health status of individuals within a well-defined socioeconomic group; and two, comparison of distribution of different socioeconomic groups. There are, nevertheless, subtle differences in the way health inequality indicators are advanced. Indicators can obtain a value-free description of the magnitude of health inequality (analogous to the measurement of income inequality) but this procedure ignores socioeconomic identities and prevents one from understanding the associated causes of health inequalities. It must also be noted that most of the available measures of health inequality provide different estimates when we assess inequalities in terms of attainment (for example, institutional delivery) and shortfall (for example, non-institutional delivery). If we perceive that these are two different types of inequalities then, their relationship in terms of estimates and directionality may be allowed to vary. However, an attainment distribution is also the flip side of a shortfall distribution, and vice versa. In view of such issues, it is important that we present estimates of health inequality which is sensitive to such concerns and are based on robust measurement techniques. A related issue here is to examine whether the levels of health inequality respond to the level of the phenomenon or are a consequence of the adopted social and economic policies.

A second problem in measurement is that most health inequality indicators adopt a standard 'individualistic' approach (inter-individual differences or individual-mean comparisons) to assess the distribution of health and, often, overlook the 'group'

dimension (inter-group differences). It must be emphasised that health deprivations, in part, are consequences of generalized deprivations in fairly basic requirements among certain disadvantaged groups and, therefore, attention needs to be drawn towards group assessments which hitherto have remained a neglected aspect of development. Group-based inequality assessments are important because these are politically salient and practical while deciding upon popular policy choices in a democratic setup. The two perspectives, namely *individual* and *group health inequalities,* could be conceptualized in the form of *vertical* and *horizontal* inequalities, respectively. Clearly, research on measurement of horizontal inequalities in health is relatively less developed as compared to its counterpart (vertical inequalities). Most of the inter-group comparisons and interpretations are performed by using measurement techniques such as simple differentials, rates and ratios. These approaches, however, fail to integrate the inter-group distribution into a summary measure and instead resort to explanation exercises alone. The measurement of group inequality, therefore, can be enhanced by adjusting the population averages for distributional inequalities. Analysing health inequalities as a combination of groups composed of multiple characteristics/identities can provide much clearer insights into the problem. Inclusion of such concerns into measurement exercise can help to discern the characteristics/identities that are maximally linked with group inequalities.

It may as well be emphasised that understanding of the sources of inequality should be the first step to formulate equity enhancing policies. An approach that emphasizes and identifies important social and economic dimensions of health inequalities can, invariably, offer better policy inferences for ensuring equity enhancing resource allocation. Findings from such analysis can provide the much needed pointers for socio-political and developmental discourse so that individuals/households are well equipped to escape the vicious combination of socioeconomic and health deprivations. Clearly, the issue at hand warrants greater inputs from alternative disciplines to identify the structural factors that intensify health inequalities. In this regard, this study seeks to contribute by adopting an economic framework and suitable inequality decomposition methods to identify key determinants that widen health disparities between population groups and intensify health inequalities.

In addition to the above concerns, measurement of achievement or progress in health should be suggestive of the nuances involved in inter-temporal comparison. Commonly, we observe that the measurement techniques such as simple rate ratios (A ÷ B) and rate differences (A - B) are employed for comparisons and interpretations. Such chosen measures are not suitable for an effective understanding of progress because they do not consider the impact of progress on health inequality and do not examine the base-level from which progress has been made. For example, we cannot discount off the possibility that the progress toward the health policy targets might be satisfactory but, at the same time, it may be sacrificing because of the widening gap between the poor and the non-poor. Under such circumstances the commonly used progress measures like rates and ratios will be indifferent to the fact that health inequality has worsened in the process. In other words, it raises a question whether a progress which is made in a more equitable manner should be valued more compared to similar progress made with increasing inequalities. Additionally, there is a clear rationale for improving (inter-temporal) progress evaluation by highlighting the possibilities that rate of progress also depends on the base-level of the health indicator. For example, it is rather difficult (hence worth rewarding) to increase life expectancy by one year if it is already at a higher level, say 76 years, compared to situation where the levels are much lower, say 56 years. Similarly, other things remaining constant, health failures could be reduced relatively faster if the base-level are higher, say 150 infant deaths per 1000 live births, whereas it becomes increasingly difficult if base-levels are lower, say 40 infant deaths per 1000 live births. Given these two issues, it is important that inter-temporal progress evaluations are made in a comprehensive manner so as to obtain an improved understanding of progress by different regions or groups.

In summary, the research concern of the study is to improve measurement of health inequalities in a country where deprivation wears many faces and its burden is borne disproportionately by different groups. The methods developed here can be useful to enhance the informational base for policy making by providing a more elaborated account of health inequality along pertinent socioeconomic dimensions. The methodological innovations are empirically illustrated with the help of Indian National Family Health Survey (NFHS) data on child health, particularly childhood undernutrition and child immunization. The empirical illustrations presented here are exploratory and indicative in nature and are not intended as definitive and exhaustive applications. It must also be acknowledged that the study gets

constrained particularly in its ability to draw far-reaching policy insights, partly, because of an illustrative focus and partly due to paucity of vital secondary information on behavioural aspects which are a fundamental determinant of child health in India. Nevertheless, the empirical illustrations should be considered useful as it is effective in exposing the stark inequalities in the distribution of child health in India and at the same time is indicative of some of the potential child health issues which warrant rigorous policy research and action. The subsequent sections of this chapter provide a brief summary of the key findings of the study and key policy implications therein.

7.2. Measurement of Health Inequality: Research Findings

This study contributes to the literature on measurement of health inequalities by enhancing our understanding of the health inequality indicators and at the same time advancing the literature with alternative methods to assess health inequalities and health progress. In response to the first research question, this study notes that traditional Concentration Index (CI) is predominantly used as an indicator of socioeconomic rank related health inequality. The CI draws its popularity primarily because of its affinity with the famous Gini coefficient (and the Lorenz curve) which is commonly employed in the literature on measurement of income inequality. However, when employed in the domain of health, the CI confronts several problems. For instance, the bounds of the CI may depend upon the mean of the health variable and can make a comparison of populations with different mean health levels problematic. It can also be discerned that different rankings of the same situation is obtained if inequalities in health rather than inequalities in ill-health are considered. In fact, for analytical purposes, most of the health variables are often classified in a dichotomous sense (for example, diarrhoea = 0, no diarrhoea = 1). Some of these problems of the CI is because health variables have a finite range (certain upper and lower limit) beyond which the variables cannot assume any value. The Corrected Concentration Index (E) - due to its proponent Guido Erreygers - overcomes the problems of the CI. Nevertheless, in the process of revising the CI, the index E significantly alters the inequality primitive underlying the CI. By way of comparison it can be noted that the traditional concentration index CI describes maximum inequality as a situation where only one individual in the distribution attains the upper limit of (ill)health variable and all others are immobilised at the lower limit. The corrected concentration index E describes

maximum inequality as a situation where the top one-half of the population has attained the upper limit of (ill)health variable and bottom half are arrested at the lower limit of the variable. Clearly, the index E assumes inequality in its statistical sense as deviation from the mode of the distribution whereas CI assumes inequality by including a value judgement which is obtained because of the integer values that the health variables are assigned. After clarifying the underlying notion of inequality adopted by these popular measures, it can be argued that, both the measures have relevance in the domain of measurement of socioeconomic rank related health inequality. For instance, the index E examines inequality devoid of any valuation and simply on the basis that how different individuals are from the majority of the population. Clearly, each of the above discussed indices holds their applicability in alternative cases and can be suitably modified to represent inequality that is unfair. Of course, conversion of corrected concentration index into an indicator of welfare would require further research attention. The study contributes by advancing simple alternative methods to estimate the corrected concentration index (and other rank-based indices) by utilising existing estimates of the traditional concentration index and the mean of the health variable. It further develops a simple regression-based technique to compute the corrected concentration index from microdata.

While progressing along the second research question, the study identifies an analytical device - Group Poverty Lorenz Profile - which is an interesting alternative to examine inter-group inequalities. It corresponds well with famous Concentration Curve that graphically illustrates the burden of socioeconomic rank related health inequality. The group poverty Lorenz profile is suitably adopted here as a graphical device to depict group health Lorenz profile. Application of the group health Lorenz profile facilitates the derivation of group analogue of Gini coefficient where - unlike the inter-individual Gini coefficient - each population subgroup is weighed according to its share in the total population. The Gini coefficient for inter-group inequality has similar properties as that of inter-individual Gini coefficient and, therefore, the limitations of the latter are applicable to the former index. In this regard, the study notes that the simple algorithm used to revise the concentration index can be extended in the case of Gini coefficient for inter-group inequality to arrive at a revised Gini coefficient for inter-group inequality. The revised Gini coefficient shares similar properties as that of the corrected concentration index and, therefore, the underlying inequality primitive and related concerns regarding its

application are equally valid while measuring group inequality. From an analytical viewpoint, the study argues for conceiving these subgroups as aggregation of individuals with similar socio-economic status or groups as an intersection of multiple identities (such as place of residence, caste, gender, religion etc.).

Proceeding along the third research question, the study highlights the effectiveness of health inequality decomposition analysis for framing equity enhancing health policies. For an effectual illustration, two inequality-decomposition techniques are used; one, Blinder-Oaxaca type decomposition; and second, decomposition of the corrected concentration index. The former approach decomposes the overall gap in the average health outcomes of two population subgroups (say, by caste or gender) into two key components; first component, represents the proportion of gap effected due to differences in the level of the determinants across these groups (for example, difference in educational level); second component, discerns the gap occurring because a given level of determinant across the groups has different effect on group's health outcomes (for example, given the water supply and sanitation, its effect on child health can differ if mothers education differs across the two households). Secondly, this study undertakes the decomposition of the corrected concentration index to understand how far unequal distribution of the identified determinants (endowments) contributes toward health inequalities. It must be noted that this empirical application is one of the first decomposition analysis of this technique.

While exploring along the fourth research concern this study is able to identify a few methods that makes health progress assessment appreciative of the concerns pertaining to health inequality and base-level differentials. The progress assessment index, developed here, satisfies certain basic properties and succeeds in viewing health achievements (or failures) in a realistic manner to develop a comprehensive vision regarding social and economic progress. The progress index is derived in two steps where in the first step the aggregate health measure is adjusted for inter-individual (alternatively, inter-group) inequality using an appropriate indicator. As a second step, the index is normalised in such a way that differential base levels have a bearing on it. Theoretically, the normalisation technique suggests for a concavification (convexification) whenever progress is assessed for indicators depicting health failures (achievements).

This section also summarizes the key research findings of the study and is further divided into two broad subsections which present insights basic understanding gained through the study.

7.2.1. Measurement of health inequality: Key Findings from Theory

- There are alternative - interindividual and individual-mean based - approaches to measure health inequality. It is important that measurement of interindividual health inequality should focus primarily on socioeconomic status related health inequality as these could be more important for policymaking and for evaluating the fairness in the distribution of health.
- Concentration index is the most commonly employed indicator to measure socioeconomic status related inter-individual health inequality. This measure, however, has certain limitations in the sense that value of the bounds of the index, to a large extent, depends on the mean of the variable; the index obtains different rankings (and values) if inequalities in terms of health rather than inequalities in terms of ill-health is measured. This implies that comparison of concentration index of health inequality among population with different mean levels becomes problematic.
- The corrected concentration index, E(h), is an improved indicator to measure inter-individual health inequality. The index E(h) is given by the following expression;

$$E(h) = \frac{8}{n^2(b_h - a_h)} \sum_{i=1}^{n} z_i h_i$$

where, set N = {1, 2, . . . , n} represents a given population of n individuals; λ_i is the socioeconomic rank of the person with the best well-off individual ranked first and the least well-off ranked last. The health variable h_i, is a real number measuring the health status of i^{th} individual and is represented by the vector $h = (h_1, h_2, \ldots, h_n)$ and b_h and a_h are the respective upper and lower bounds of the health variable.

- The study finds that the corrected concentration index, E(h), is related with the traditional concentration index, C(h), as follows,

$$E(h) = \frac{4\mu_h}{(b_h - a_h)} C(h)$$

where, b_h and a_h are the respective upper and lower bounds of the health variable; and μ_h is the mean of the health variable.

- The above finding and the simple relationship can be extended to obtain regression based estimates of the corrected concentration index using a similar regression framework as used to estimate traditional concentration index.
- The study also finds the primitive notion of inequality behind the corrected concentration index and the revised Gini coefficient. In these indices, inequality is conceived as a departure from the health status of the majority of the population.
- Measurement of inter-group (horizontal) inequalities can be improved by introducing measures which consider the population share of the group while estimating inequalities. Also, contributions in terms of enhanced graphical illustration of inter-group inequalities can facilitate to comprehend the magnitude of inequalities across situations.
- The measurement of group inequality can be enhanced by analysing groups formulated as a combination of multiple characteristics/identities. Incorporation of such concerns into the measurement exercise would not only help us to discern the characteristics/identities that are linked with health adversity/privilege, but also inform us on the extent to which the aggregate levels of deprivation masks the observed disparity across groups.
- The inter-group inequality indicators employed in this study consider equality as a state where the population subgroup share should be equal to the share in health outcome vulnerability. From an analytical viewpoint, these subgroups could be conceived of in terms of aggregation of individuals with similar socio-economic status or any other grouping criterion.
- The Relative Disadvantage Index – an indicator of inter-group disparity – follows the popular notion of equity in relative terms and defines a state of zero relative deprivation (neither advantaged nor disadvantaged) if the contribution of a group, say 'j', in overall health deprivation is equal to its population share. Group 'j' is interpreted to be *relatively advantaged* if the

contribution of group 'j' in overall health deprivation is less than its population share and *relatively disadvantaged* if the contribution is more than its population share.

- This study introduces to the health literature a group-analogue of Gini coefficient that accounts for intergroup differentials by means of graphical devices called the group poverty profile and group poverty Lorenz profile. This approach 'adjusts' a real valued index of deprivation in such a way that the resulting measure is a summary statistic of both the average level of deprivation and the extent of inequality obtained in its distribution. The weighing procedure adopted for this group inequality index is such that subgroups with higher health deprivation are accorded higher weights.
- In addition to a general regression based multivariate framework, two distinct analytical approaches - Blinder-Oaxaca decomposition and corrected concentration index decomposition - can be used to understand the causes of inequalities in health outcomes.
- Blinder-Oaxaca decomposition helps to explain the gap in the means (averages) of the outcome variable between two groups, such as poor and non-poor (or rural and urban). The gap is decomposed into a part that is due to group differences in the magnitudes of the determinants of the outcome, on the one hand, and group differences in the effects of these determinants, on the other.
- Decomposition of the corrected concentration index for health outcomes is useful to understand the contributions of the identified determinants in engendering socioeconomic rank-related inequality. The advantage of this method is that it allows for decomposition of health inequalities across the full distribution of income. More specifically, this decomposition is performed to understand how inequalities in the distribution of determinants give rise to inequalities in underweight outcomes.
- This study argues that measurement of achievement or progress in health should be suggestive of the nuances involved in inter-temporal comparison. For instance, we cannot discount off the possibility that the progress toward the health policy targets might be satisfactory but, at the same time, it may be sacrificing because of the widening gap between the poor and the non-poor.

Also, there is a clear rationale for advancing inter-temporal progress evaluation with indicators that accounts for base level differentials.

- In order to construct an index for progress evaluation a two-step procedure is adopted. Firstly, the indicator of average health failure is adjusted to reflect the income-related and inter-group health inequality and in the second step level-differentials are accounted for.

7.2.2. Measurement of Health Inequality: Key Findings from Illustrations

- The empirical illustrations were effective in exposing the stark inequalities in the distribution of child health in India and at the same time are indicative of some of the potential child health issues which warrant rigorous policy research and action.
- Empirical illustrations for measurement of inter-individual inequalities in child health in India were based on two alternative approaches; one that measures pure health inequality (where individuals are ranked irrespective of socioeconomic status) and the other for measurement of socioeconomic-rank-related health inequality.
- A state-level examination of the pure health inequality (based on ranking rule used in income inequality measurement) reveals that Madhya Pradesh, Bihar and Jharkhand have higher magnitude of inequalities in childhood undernutrition (respective revised Gini coefficient (G*) values of 0.399, 0.378 and 0.372) whereas Kerala, Tamil Nadu and Punjab have lower inequality levels (G* values of 0.121, 0.165 and 0.165, respectively).
- The revised Gini coefficient – an indicator of pure health inequality - are noted to be positively and significantly correlated with the prevalence of childhood undernutrition in India.
- The socioeconomic rank related health inequality estimates - based on the corrected concentration index E(h) - reveals a pattern of inequality which is entirely different from the estimates obtained from the traditional concentration index C(s).

- In the context of childhood undernutrition in India, the index E(h) revealed that there are huge socioeconomic status related health inequalities in the distribution of underweight outcomes, E(h) = 0.28 for all-India.
- As per E(h), Madhya Pradesh (0.196) is noted to be the least unequal state whereas Uttaranchal (0.328) is found to be the most unequal state. It is surprising to note that the states of Punjab and Kerala which are ranked first and second, respectively, in terms of inequalities by the index C(s) move in opposite directions when compared using E(h). Kerala moves toward the group of more equal states whereas Punjab continues to be placed among highly unequal ones.
- The estimates obtained through the application of corrected concentration index, E(h), motivates us to revisit the attainment-inequality relationship in health outcomes which, until recently, was acknowledged to be significantly positive. However, this study observes that these inequalities are insignificantly associated with the levels of undernourishment.
- The group profile of nutritional deprivation and the distribution-sensitized deprivation levels across the groups were effective in exposing the stark inequalities and reveal that certain identifiable groups in India bear the brunt of childhood undernutrition.
- The group inequality 'adjusted' underweight incidence reveals that the high-income states of Kerala and Punjab are marked with highly inequitable inter-group distribution of underweight outcomes (*groups cross-classified by poverty status, gender, caste and maternal education*).
- Evidently, the problem of nutritional failure is severe when a child belongs to *Poor* household with *Uneducated* mother having a *Low* body mass index (PUL group). For all India, around 60 percent of children belonging to PUL group are underweight. In fact, in states of Madhya Pradesh and Bihar, the proportion of undernourished children in the PUL group is 72 percent and 70 percent, respectively.
- The problem of nutritional failure is considerably higher when the child belongs to a SC/ST household residing in rural area particularly in the states of Bihar, Madhya Pradesh, Jharkhand and Chhattisgarh (above 60 percent).

- At the all-India level, the study finds no significant sex-wise differences in the prevalence of nutritional deprivation, nonetheless, the prevalence is moderately higher among female children in the states of Northern and Eastern India. The picture does not seem to have improved in the last two decades as gender differentials continue to be stronger in the states such as Bihar, Madhya Pradesh, Punjab, and Uttar Pradesh. With the exception of Andhra Pradesh, girls in the other three southern states (Karnataka, Kerala, and Tamil Nadu) have better nutritional health.
- Disparities between the groups and within the states tend to increase as we move from the most disadvantaged to the least disadvantaged groups. The study obtains some serious evidence on acute sub-national welfare divisions within the country. To gain insights in this regard one has to only compare the underweight prevalence of 11 percent among the non-SC/ST-urban-female children in Kerala as compared to the rural-female-SC/ST children of Madhya Pradesh with 73 percent underweight prevalence.
- The Blinder-Oaxaca type decomposition is applied on children cross-classified by caste identity and by place of residence. The result reveals that the nutritional gap between the SC/ST and the remaining population (or the rural and urban population) is largely due to differences in income, maternal education, basic amenities across the two groups of children.
- The result further indicates that differences in the effects of the endowments also play an important role. For example, at a given household income, children belonging to a non-SC/ST household tend to benefit more than SC/ST children. This can probably occur because of additional benefits (externalities) of residing among non-SC/ST households in terms of improved education, (so health care) or improved hygiene and sanitation.
- Based on the theoretical exposition for decomposing the corrected concentration index, this study undertakes the first known decomposition analysis of the corrected concentration index (E(h)) at the all-India level.
- The findings suggest that inequalities in the distribution of household amenities and maternal education are the two prominent factors that significantly intensify child health inequalities.
- It must be noted that the analysis is not performed at disaggregated (State) level which can probably influence the conclusion regarding certain regional

factors. For example, gender at the national level is not observed to be a significant determinant affecting nutritional health. However, it is plausible that gender might be a significant factor if the analysis is carried out at a regional level.

- This study provides an empirical illustration for progress assessment in the case of child immunisation in India. The results indicate a clear reshuffling of ranks when we use the progress index instead of the conventional technique of comparing absolute differences or percentage change.
- For instance, based on simple comparison of percentage change it is noted that Kerala and West Bengal both obtain the highest rank. However, in terms of the progress index, West Bengal is the number one state in immunisation progress with an index value of 0.272. This is because it had a higher base level deprivation than Kerala and has managed to reduce immunisation failures without compromising much on inter-group inequality. This is unlike Kerala, whose exceptional reduction in incomplete immunisation happens to be distributed unevenly across the population subgroups cross-classified by gender, caste and place of residence.
- When interindividual inequality measure are adopted to adjust for socioeconomic rank related inequalities in childhood immunisation; in rural areas, Tamil Nadu (0.306), West Bengal (0.259) and Kerala (0.135) achieve higher progress index scores. In urban areas the higher values are obtained by Kerala (0.411), West Bengal (0.321) and Haryana (0.264).
- During NFHS 1992-93 to NFHS 2005-06, Kerala, West Bengal, Tamil Nadu, Haryana, Orissa and Bihar are among the group of well performing states in increasing child immunisation coverage whereas Maharashtra, Gujarat and Punjab have poor progress in child immunization.

7.3. Measurement of Health Inequality: Conclusions and Policy Implications

- The motivation behind this study was to advance methods to develop health planning by obtaining a comprehensive vision of health inequalities in relation to social and economic dimensions. Given the motivating spirit, the study contributes to the literature on measurement of health inequality by advancing alternative methods, including regression-based techniques, to

produce the inter-individual health inequality estimates for different rank based indices.

- This study suitably adopts techniques to examine the inter-group and inter-individual differentials in childhood underweight outcomes and suggests policymakers to view groups as a combination of multiple characteristics and identities. From an analytical perspective, this study provides one of the first empirical applications of group based Lorenz profile in the discipline of health inequality measurement.
- There is a considerable scope to apply the methods proposed in this study in varying contexts and regions, or on alternative health indicators. For example, the methods discussed in this study can be suitably replicated in examining educational inequality.
- This study highlights that, while progressing towards targets - say, for example, Millenium Development Goals - policy appraisals should not sightlessly entertain unadjusted level comparisons. On this count, the study further contributes by advancing an indicator of progress assessment that accommodates concerns pertaining to equity and level differentials evaluating achievements in a realistic manner.
- The empirical illustrations identify India as one of the unconvincing performers in the domain of child health. The empirical analysis presented here effectively highlights improved maternal nutrition and education, household hygiene and sanitation as key policy factors to improve child health.
- Based on the findings that Madhya Pradesh, Jharkhand and Bihar have higher undernutrition level (over 40%) even among the advantaged groups (like Urban, Male and non SC/ST), this study argues for improved understanding of child health situation in the central and eastern part of the country.
- The study also argues that inequality decomposition analysis and understanding of inter-group inequalities can help in deciding whether policy variables should be adopted in general or whether certain focal variables have to be designed based on region specific or context specific requirements.

- In this regard, the study visualises a clear need for promotion of general living standards among the deprived population subgroups. The study, therefore, suggests for devising health policies and programmes that can help to reduce health deprivations particularly, among the females, the rural poor and the SC/ST population.
- In concluding, this study - based on the empirics - conveys the message that health inequalities are perhaps the result of the policies adopted for advancing health. Whether we adopt an inclusive health policy or focus on strategies that are not supportive of wider participation is very much a part of actions that induce health inequality.

7.4. Limitations of the Study

A few scholars have, however, questioned the quality and reliability of the NFHS data pertaining to child anthropometrics (see Rajan and James 2008, 2004, James and Rajan 2004, Deaton and Dreze 2009, Svedberg 2010). For instance, Deaton and Dreze (2009) are critical about the assumption that the international anthropometrics standards are applicable to India and argue that such an assumption can be valid only if the 'gradual catch-up' hypothesis[45] holds true. The authors are also concerned about the differences observed in child underweight trends when compared to data from other sources (such as National Nutrition Monitoring Bureau, NNMB). In this regard, Svedberg (2010) note that comparability of trends might not be a major concern but the author suspects the NFHS-3 based child underweight estimates for rural areas of nine selected states for which NNMB estimates were also available. Clearly, there is an urgent need for detailed, regular and reliable nutrition monitoring arrangements for India (Deaton and Dreze 2009). Such limitations do holds back researchers from providing accurate results for policy action. Nevertheless, this study expects that the methods developed in the paper can be easily applied in future analyses.

In addition to issues around data quality and reliability, an other limitation of the study is that it is entirely based on the analysis of secondary data, in particular

[45] The 'gradual catch-up' hypothesis says that Indian children have the same genetic potential as children in the reference population, but it takes time for the heights of privileged children to catch up with the genetic potential, given the history of undernutrition (Deaton and Dreze 2009).

NFHS 2005-06, and therefore can offer limited alternative explanations for the observed inequalities in health. Although the study succeeds in illustrating the alternative methods to measure health inequality but because of availability of limited information the scope of the study gets constrained particularly in its ability to draw far-reaching policy insights. All that could be done here is to use a proxy for the kind of policy information which we are seeking. For example, maternal education, availability of safe drinking water and sanitation facility acts a proxy for household hygiene.

The study also finds itself of limited efficacy as far as evaluation of child health programmes (Integrated Child Development Services, ICDS) is concerned. This is because the nature of information available in NFHS 2005-06 does not offer greater scope to examine the policy effectiveness as it does not collect information on the design, functioning and problems with the ICDS in different regions. All that could be accomplished is a comparison of health outcomes in ICDS and non-ICDS regions; which is presented in the NFHS 2005-06 reports but does not help much to understand the causes for differential performances, if any. Certainly, corroboration through primary data and field based research would have enhanced the effectiveness of the interpretations offered here but could not be performed due to time and resource constraints.

7.5. Issues for Further Research

- There is a great scope to revisit the measurement of inter-individual and inter-group health inequality measures given the fact that the inequality primitive or the ideals of inequality adopted by these various health inequality indicators tend to vary considerably. Further research can evaluate the inequality primitive of each indicator and can inform the literature on the suitability and the policy connotations of employing alternative indicators for measurement of health inequality.
- Health inequalities ideally need to be multidimensional because health deprivations often tend to be concentrated among certain disadvantage sections of the society. A multidimensional framework which includes as many health indicators - say, pertaining to child health or maternal health -

can help in highlighting the depth of such deprivations and the magnitude of health inequalities arising due to multiple deprivations in health.

- Further research needs to unfold the possible bearing if any of health inequality with improvements in health outcomes. As demonstrated by this study, the notion that health inequalities tend to worsen because of progress in health might not be always true. Empirical analysis using different health outcomes and alternative health inequality indicators can help us effectively to comment on the association between health inequality and health achievements.
- Further research on progress assessment indicators will be useful to arrive at alternative indicators. For example, we can understand whether adjustment with Gini coefficient for inter-group inequality would be sufficient to address the problem of inter-group inequality as well as base level differentials. Such methods can be very effective in examining the progress toward MDGs in health.