



INTER-TEMPORAL ANALYSIS OF MALNUTRITION AMONG CHILDREN IN INDIA

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Abstract

After independence India has inherited an economy of mass poverty. We have suffered from food shortage till the arrival of green revolution. Green revolution certainly has increased food availability in the country. In spite of many achievements in economic growth and reduction of poverty, the nutritional status of children measured by anthropomorphic measures remains to be dismal. India remained a laggard among developing countries. Government has come with many initiatives to address the problem. It is very important to evaluate the performance economy in the improvement nutritional status during the last two decades of high growth. In this study we use the data provided by the various rounds of NFHS surveys. We analyze the performance of economy at the national level and a detailed analysis of states is undertaken. We use rank correlation to find the relationships between different measures of nutritional status and important determinants of their improvements. We find considerable decline in the measures of undernutrition at the aggregate level. There are however significant disparities between rural and urban population and there is persistence of gender disparities, inequality across social groups as well. Some states like Kerala and Tamilnadu continue to be best performing states. States like Andhra Pradesh have moved up the ladder, some states like Bihar continue to be laggards. Improvements in child immunization, drinking water facilities and sanitation explain the differential performance of the state in the achievements of reduction in the measures of malnutrition. Evidences make it abundantly clear that there should be a focus on the laggard states in meeting with challenge of providing safe drinking water facilities and sanitation.

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Introduction

At the time of independence India suffered serious problem of poverty. Food shortages continued to plague India till the arrival of green revolution while green revolution has certainly increased the availability of food grains access to food for millions of people was still a far cry. Government has established wide network of public food distribution system. It was recognized that it was not adequate enough to provide food security for the children. Anthropomorphic measures of nutrition status put India in poor-limelight it was also recognized that inadequate nutritional security for the children has far reaching consequence for the future of the country. Govt has come up with massive program to provide nutrition security in the name of ICDS. Anganwadis were established to meet the challenge of undernutrition. As a result of these efforts India has made some progress however the progress is uneven across states some states have made considerable progress while others are lagging behind. Many studies have this pointed out quite clearly. This means more targeted efforts are needed to reach the most vulnerable populations. More emphasis should be placed on the quality of Anganwadis and the care provided. Additionally, greater collaborations between Anganwadis and the health system need to be explored. Resources should be allocated to ensure that Anganwadis are adequately staffed and supplied to provide the necessary care. In addition, community engagement should be strengthened to ensure that communities are aware of the services available and to ensure access to these services. Lastly, initiatives should be implemented to incentivize people to access the services and ensure that they are aware of the importance of early childhood health and development.

Literature Review

There is a direct or indirect connection between poverty and malnutrition (Gebhart, 1920). Families with poverty have a difficult time providing food for their children, develop unhealthy food habits, and have a hard time choosing food and other amenities. Sukhatme (1987) observes that factors other than purchasing power contribute to malnutrition. Child malnutrition can be mitigated by reducing income poverty (Strauss & Thomas, 1998). There is a direct correlation between poverty, hunger, and malnutrition (Haddad et al., 2003). Based on household survey data from 12 countries and cross-country data from 61 countries (1970-95), they concluded that increasing household income reduces underweight among children.

A lack of nutrition is associated with low birth weight, protein inadequacy, respiratory tract infections, diarrhoea, and worms. In Wayanad district, Kerala, Sabu et al. (2020) examined the nutritional status of children aged 2 to 5 belonging to the Paniya and Kurichya tribes. There was a significant difference between tribes in nutritional status, according to the study. As a measure of undernutrition, the Composite Index of Anthropometric Failure (CIAF) was used. There was a significant association between CIAF and community identity, early marriage and food insecurity in the household. All three forms of anthropometric failure were associated with domestic violence. Among children aged 1 to 5 living in the urban slums of Karimnagar town, Kaushal (2019) examined the status of primary immunization coverage and its relationship to nutritional status and morbidity. Malnutrition and immunization status of the child are statistically significant. Based on a comprehensive review of literature from 1990 to 2016, Nasreddine et al. (2018) analysed the nutritional outcomes and food intake of children in selected countries in the Eastern Mediterranean Region (EMR). Several key issues are identified from the literature review, including the triple burden of malnutrition (underweight, nutrient deficiencies coexisting with overweight) aggravated by poor dietary habits, and the lack of national nutritional surveys.

Using a sample survey of coffee farmers, Asselt and Useche (2021) evaluate the effects of commercialization on the nutrition levels of children. They examine how commercialization affects nutrition through different pathways. In their study, they found that commercialization of coffee production reduced household calory availability. As a result, coffee dependent households are less likely to produce a variety of food, reducing their nutritional diversity. Holland and Rammohan (2019) examine the relationship between women empowerment and children's food and nutrition security. They found that stunting among children is influenced by women's autonomy in household production, decision-making, and confidence in public speaking.

Data and Methodology

In this paper we use latest round of national health and family survey data to evaluate the performance of the different states in the reduction of malnutrition. We also analyze the factors that explain the varied performance across states. To investigate the relationship between nutritional status and important determinants of improvement, rank correlation is used. This method allows for the identification of the strongest predictors and can be

used to measure the degree of association between variables. Rank correlation can also provide insight into the direction of the relationship between two variables. Rank correlation can also be used to identify potential confounders and potential causal relationships between variables. This method can also be used to determine if there is any non-linearity in the relationship between two variables. Secondary data sources, NFHS reports and CNNS 2019 are employed to look into the changing context of the nutritional status of children under five and women across the states of India. Nutritional outcome among children in various districts of Kerala, health and nutritional indicators of children across social groups, IYCF practices, and maternal health care indicators are also analyzed.

Results

Inter-Temporal Changes in Child Nutritional Status among States in India

The comparison of various rounds of NFHS helps us to evaluate the inter-temporal changes in child

nutritional status among 21 major states in India. The rank correlation coefficient shows the changes in the relative position of various states in the current period as compared to the base year. Table 1 shows the rank correlation coefficient of nutritional indicators among states between NFHS 3 and NFHS 4. All values of rank correlation coefficients are high and positive, imply that there is not much change in the relative status of states on child nutritional outcome over the period. As compared to wasting, the rank correlation coefficient of stunting and underweight are very high and positive. It is inferred that the relative status of states on stunting and underweight remain the same. The states that witnessed a high percentage of stunting and underweight children during NFHS3 period could not make any dent even during the NFHS 4. Despite overall progress in stunting, wasting and underweight in the country, the relative status of states remains the same. The results also indicate that the rank correlation coefficients are not only high but also very significant.

Table 1: Rank Correlation Coefficient of Nutritional Indicators

Nutritional indicators	Rank correlation coefficient between NFHS 3 and NFHS 4
Stunting	0.888**
Wasting	0.616**
Underweight	0.911**
**Correlation is significant at the 0.01 level (2-tailed)	
*Correlation is significant at the 0.05 level (2-tailed)	

Source: Calculated from NFHS 3 and 4

Table 2 shows the rank correlation coefficient of relevant key indicators between NFHS 3 and 4 period. The values of rank correlation coefficient show that the relative status of states in terms of percentage of anaemic children (6-59 months), percentage of women whose BMI is below the normal, percentage of women had iron-folic acid during pregnancy, institutional birth and birth attended by a health professional, remain the same. It implies that the states could not make any change in their relative status in these aspects over the

period. At the same time, there is a perceptible change in the position of states concerning the percentage of children immunized, children with diarrhoea taken to hospital and mothers who had at least four antenatal check-ups. The states which are backward in the above aspects in NFHS 3 improved in NFHS 4. This is inferred from the low and negative values of correlation coefficients. It also implies that the progress achieved in these key indicators in India is not uniformly distributed across the states.

Table 2: Rank Correlation Coefficient of Relevant Key Indicators between NFHS 3 and NFHS 4

Key indicators	Rank correlation coefficient between NFHS 3 and NFHS 4
Percentage of children 6-59 months anaemic	0.720**
Percentage of children aged 12-23 months fully immunized	-0.269
Percentage of children with diarrhoea taken to a health facility	-0.259
Percentage of women whose BMI is below normal	0.943**
Percentage of all women aged 15-49 years who are anaemic	0.353
Percentage of mothers who had at least four antenatal check-ups	-0.501*
Percentage of women during last pregnancy took Intake of iron-folic acid for 100 days or more	0.889**
Percentage of institutional birth	0.730**
Percentage of births assisted by trained professional	0.714**

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Source: Calculated from NFHS 3 and 4

Conclusion

We find considerable decline in the measures of undernutrition at the aggregate level. There are however significant disparities between rural and urban population and there is persistence of gender disparities, inequality across social groups as well. Some states like Kerala and Tamilnadu continue to be best performing states. States like Andhra Pradesh have moved up the ladder, some states like Bihar continue to be laggards. Improvements in child immunization, drinking water facilities and sanitation explain the differential performance of the state in the achievements of reduction in the measures of malnutrition. Evidences make it abundantly clear that there should be a focus on the laggard states in meeting with challenge of providing safe drinking water facilities and sanitation. This is especially important in rural areas, where access to clean drinking water is limited. Ultimately, safe drinking water and sanitation are essential for the health and wellbeing of the population, and access to these facilities should be a priority. Policies and programs need to be put in place to ensure that all citizens have access to safe drinking water and sanitation. Governments must prioritize investment and allocate resources to ensure that the most vulnerable communities are not left behind. It is also essential to ensure that the facilities are maintained and repaired regularly.

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