

INDIA HEALTH BEAT

Supporting Evidence-based Policies and Implementation

Volume 5 Number 1
June 2011

NUTRITION IN INDIA

Ashi Kohli Kathuria^{*}

This policy note, the first in a series of ten, serves as the backdrop for this volume on nutrition. Highlighting the importance of nutrition, it provides an overview of the situation of nutrition in India, its variation across socio-economic groups and states. Further, using the undernutrition causal framework with “food-care-environmental health” as the triad of immediate causes, it uses national data to demonstrate the association between the adequacy of these determinants and child nutrition outcomes.

Recently nutrition has received renewed attention by all stakeholders in the country, particularly, at the highest levels of policy making. Discussions at various forums, including those at the topmost political and planning levels, of the key issues and challenges that constrained the performance of past nutrition policies and programs, has culminated in charting out the future policy and program directions to address India’s alarming undernutrition problem. This consensus on future directions outlined in the Government of India’s strategy paper “Addressing India’s Nutrition Challenge”, and most importantly, the recent call for action by the Prime Minister’s National Nutrition Council, demonstrates the urgency and commitment to improving nutritional status in India.

It is against this milieu that this volume of ten policy briefs covering various aspects of nutrition in India assumes high relevance. This policy note highlights the importance of nutrition and provides an overview of the situation of nutrition in India, including how it varies across socio-economic groups and states. Further, using the undernutrition causal framework with “food-care-environmental health” as the triad of immediate causes, it analyzes the National Family Health Survey-3 (NFHS-3) data, to demonstrate the association between the adequacy of these determinants and child nutrition outcomes. Serving as the backdrop for this volume, the note also offers a roadmap to the other policy briefs in the series.

Investing in nutrition is critical for human capital formation and economic growth

Undernutrition is the single largest factor contributing to the death of young children. It increases the mortality risk associated with the major killers of children (respiratory infections, diarrhea, malaria, measles and other infectious diseases). In India, more than half of all deaths in children

Box 1: Indicators of undernutrition

The three key indices of physical growth used as measures of child undernutrition are:

Stunting or low height-for-age representing chronic undernutrition;

Underweight or low-weight-for age representing a combination of long-term and immediate-term undernutrition; and

Wasting or low weight-for-height, representing acute under-nutrition.

Each of the above indicators is expressed in standard deviation units (Z-scores) from the median of the reference population (below two standard deviations of the mean for each respective measure)

under five are related to malnutrition, with mild to moderate undernutrition contributing to 43 percent of the deaths and severe malnutrition to 11 percent. [1]

The economic costs of undernutrition are substantial. Direct productivity losses are estimated at more than 10 percent of lifetime individual earnings, and about a 2-3 percent loss to GDP. [2] Indirect losses are associated with deficits in cognitive development and schooling, and increased costs of health care. In terms of human development, malnutrition (stunting) in early years is linked to a 4.6 cm loss of height in adolescence, 0.7 grades loss of schooling and a 7-month delay in starting school. [2] Much of this undernutrition occurs during pregnancy and in the first two years of a child’s life and without appropriate interventions, the damage to physical and cognitive development, future economic productivity, and to human development, is largely irreversible.[3] Annually, India loses over US\$12 billion in GDP to vitamin and mineral deficienciesⁱⁱⁱ. However, scaling up core micronutrient interventions would cost less than US\$ 574 million per yearⁱⁱⁱ.

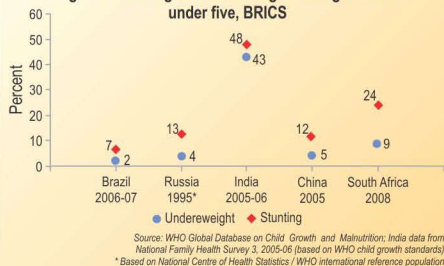
Malnutrition in India is a ‘not-so-silent’ emergency

India, currently, has one of the highest malnutrition rates in the world. One-third of its children are born with low birth-

^{*}Senior Nutrition Specialist, Health, Nutrition & Population Unit, The World Bank
The author acknowledges contributions of John Lincoln Newman, Lead Poverty Specialist, The World Bank

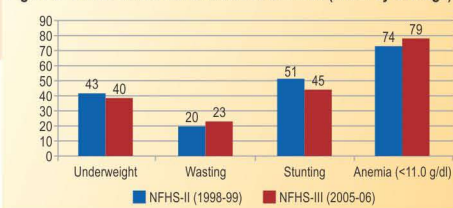
weight, 43 percent of children under five are underweight, 48 percent are stunted and 20 percent are wasted. Stunting rates in India are two to seven folds higher than those of other BRICS countries (Figure1) Micronutrient deficiencies are extremely high with almost 75 percent of the under threes being anemic³, 62 percent deficient in vitamin A⁴ and over 13 million infants remaining unprotected from iodine deficiency disorders⁵.

Figure1: Stunting and Underweight among children under five, BRICS



Despite the impressive rate of economic growth in the past decade, malnutrition in India has declined very little. In fact, anemia levels in children have increased (Figure 2). Amongst women too, undernutrition is high and has declined only marginally from 36 percent in 1998-99 to 33 percent in 2005-06, while anemia levels have increased from 52 to 56 percent in the same period.

Figure 2: Trends in Nutritional status of Children (under 3yrs of age)



Effective interventions are known which when provided at scale during the first 1,000 days of life can improve undernutrition. These include breastfeeding counseling, appropriate complementary feeding, micronutrient interventions (vitamin A, zinc, iodine and iron), deworming, hand-washing and hygiene, and food supplementation in food insecure settings.[3]

Policy note #2, 'Overcoming challenges to accelerating linear growth in Indian children', by Prof. Harshpal Singh Sachdev, highlights that *height-for-age* or stunting at two years of age is the best predictor of human capital in low and middle-income countries, and that stunting should be used as a primary indicator of nutrition. Analyzing national data, the note demonstrates the feasibility of improving

linear growth or reducing stunting in India and highlights the imperative to accelerate this reduction. Further, it examines the evidence base for improving linear growth and concludes that there is only a narrow window of opportunity—from conception to two years of age—to improve stunting. Exploring policy and program options, the note presents recommendations for reducing stunting in India in the short-term.

Policy note #3, 'The 1,000 day window of opportunity for improving child nutrition in India', by Purnima Menon and Victor Aguayo, lists ten essential direct nutrition interventions for children in India. These, while based on the Lancet special series on Maternal and Child Undernutrition, are contextualized to India's undernutrition epidemiology. Using national data, the note confirms that undernutrition in India sets in, as it does globally, during the first 1,000 days of life—from conception to the end of the second year. It also demonstrates that the coverage of the essential interventions during this window of opportunity is poor, varies from state to state, and is strongly and significantly associated across states with levels of child stunting.

Policy note # 4, 'Enhancing optimal infant feeding practices in India', by Arun Gupta, J. P. Dadhich and Shoba Suri focuses on the critical role of Infant and Young Child Feeding (IYCF) practices in improving nutrition, child survival and development. Highlighting the dismal state of IYCF practices in India, the authors analyze the major causes for this, including the gaps in policy and programs, and emphasize the urgency for achieving high IYCF rates in India. The note cites evidence to show that effective strategies do exist and that it is possible to improve IYCF practices in India. It further recommends a seven-pronged strategy to strengthen policy and program action for India to improve IYCF practices.

The following section presents data on the distribution of undernutrition across socio-economic groups, rural-urban areas and states, along with an outline of the policy briefs that address these issues.

There are significant inequalities in undernutrition across socio-economic groups and geographical areas

Undernutrition reflects and contributes to inequality, disproportionately affecting poor, marginalized and extremely vulnerable groups, including those living in rural settings. While aggregate levels of undernutrition are shockingly high, the picture is further exacerbated by the significant inequalities across socio-economic groups, with the poorest, the scheduled tribes and castes, and those residing in rural areas being the worst affected. Similarly, undernutrition varies widely across states with some states being much worse off than others. (Figures 3, 4 and 5).

Undernutrition increases proportionately from the highest to the lowest wealth quintiles. While undernutrition is higher in children from the lower wealth quintiles, it is substantial even in the middle and upper wealth quintiles.

Figure 3: Stunting, Wasting and Underweight among children under five by household wealth



Figure 4: Stunting, Wasting and Underweight among children under five by caste/tribe

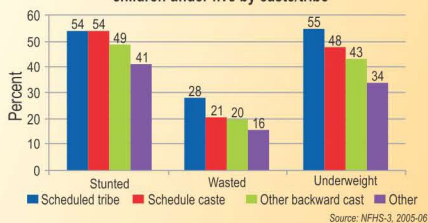
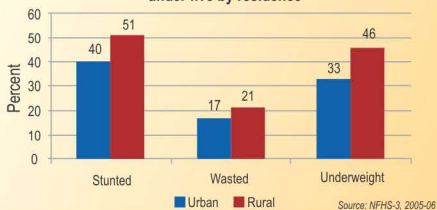


Figure 5: Stunting, Wasting and Underweight among children under five by residence



This indicates that undernutrition in India is not a 'poverty' or 'food insecurity' issue alone, and has other associated factors. These are further discussed in the section, 'Key determinants of nutrition and their status in India'.

While the critical need to reach out to the poor and excluded groups is a recurrent theme across several policy notes, Policy Note# 5, 'Addressing the unequal burden of malnutrition' by Sukhadeo Thorat and Nidhi Sadana Sabharwal, is dedicated to a deeper analysis of the inequities in nutrition across socio-economic groups. The authors examine data to show that malnutrition levels of women and children from SC and ST communities are higher than those of the General Category (GC) and the pace of decline of undernutrition across these groups has been much slower than that in the GC. They note that while nutritional status is closely linked with levels of income, mother's education and access to public health services, social identity is an additional aggravating factor.

Controlling for other factors, the likelihood of SC and ST children being undernourished is about 1.4 times that of children from the GC. The note recommends two sets of policy measures—one, aimed at improving nutrition of all poor, irrespective of caste; and the other, promoting specific measures aimed at discriminated groups.

While undernutrition in urban areas remains high, rural areas are worse off. However, as discussed in Policy Note# 2, between 1998-99 and 2005-06, rural areas have shown a greater decline in stunting relative to urban areas, a trend that suggests the feasibility of improving nutrition outcomes even in relatively deprived settings. The pace of decline, however, needs to be accelerated.

Urban areas present their own challenges. Policy Note# 6, 'Overcoming the challenges of urban food and nutrition security' by the World Food Programme and the M. S. Swaminathan Research Foundation, focuses on the unique challenges that rapid urbanization, the urbanization of poverty, urban inequalities, and the declining food consumption levels present for food and nutrition security in urban India. The note highlights that the urban food and nutrition security situation has improved only marginally between 1998-2000 and 2004-06. This progress has been uneven across states, and public programs providing food and nutrition services do not adequately and effectively meet the needs of urban populations, especially the urban poor. The note outlines policy actions required to address the unique challenges of urban food and nutrition security.

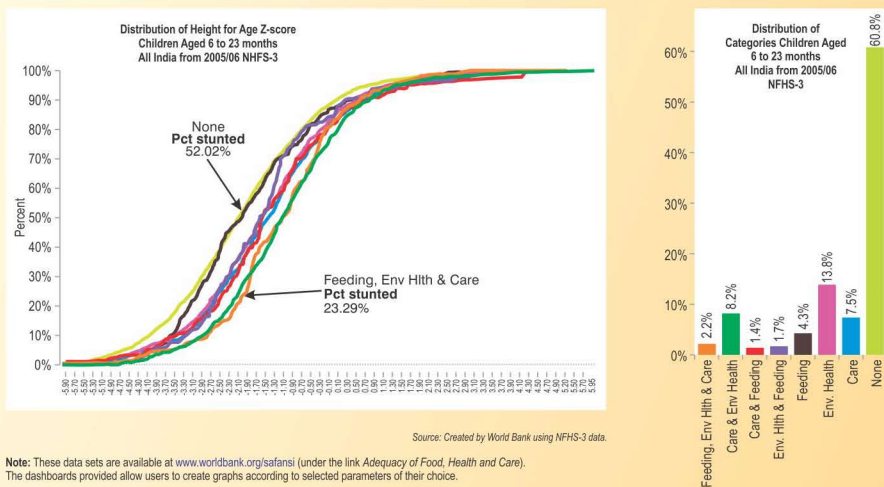
Undernutrition varies widely across states. While every state has a substantial nutrition problem, undernutrition levels are much higher in some states. Stunting rates of over 50 percent are seen in Jharkhand, Madhya Pradesh, Chhattisgarh, Gujarat, Meghalaya, Bihar and Uttar Pradesh. Similarly, districts show variation in nutrition levels.[1] Policy Note# 3 and the following sections discuss some aspects of the variations in nutrition across states.

Having looked at the undernutrition scenario in the country and its variation across various groups, it is highly pertinent to examine national data that throws light on the situation related to the key determinants of nutrition and how these effect nutrition outcomes. The following section does so, and introduces the policy briefs relevant to this discussion.

The key determinants of nutrition: their status in India

The triad of food, care, and environmental health: Lack of food or food insecurity is often 'equated' with undernutrition or thought to be its main causal factor. It is widely accepted that at the most immediate level, undernutrition is determined by three categories of causal factors, namely *food intake, care for children and women, and environmental health and health services*, with factors such as income poverty, gender, education underpinning all three (see undernutrition causal framework in Policy Note# 7). [3] While the larger political, economic, social and cultural environments also play a role, the following analysis shows that the adequacy (or

Figure 6: Distribution of stunting in children 6-23 months old according to adequacies of feeding-care-environmental health, India



inadequacy) of these three categories has a strong association with how well nourished (or undernourished) children will be.

Figure 6 presents the national distribution of 'height-for-age Z-score' for children 6-23 months old, according to their adequacy in terms of eight mutually exclusive categories that represent the various permutation-combinations of feeding, care and environmental health as shown in the bar graph on the right of the figure. Children can be adequate in all dimensions, in none or anything in between. The curves on the left panel demonstrate that *stunting rates in children who have adequate feeding, care and environmental health are half of those for children who have none of these in adequate measure (23 percent versus 52 percent)*. The bar graphs on the right of the figure show the percentage of children adequate in each of the eight categories. This data shows that *over 60 percent of Indian children do not have adequacies in any of the dimensions of feeding, care and environmental health; and less than 2.5 percent of children are adequate in all dimensions*. Given these inadequacies, India's huge undernutrition burden should not be an enigma.

Examining the adequacies of feeding, care and environmental health in children using pooled data for Bihar, Madhya Pradesh and Uttar Pradesh (states with high levels of malnutrition) and for Kerala, Goa, Tamil Nadu and Punjab (states with relatively lower levels of malnutrition) throws up some interesting findings (Figure 7). First, the distribution of height-for-age curves for children in the two groups of states shown in the middle panel of the figure varies considerably (51 percent and 34 percent respectively). Second, although

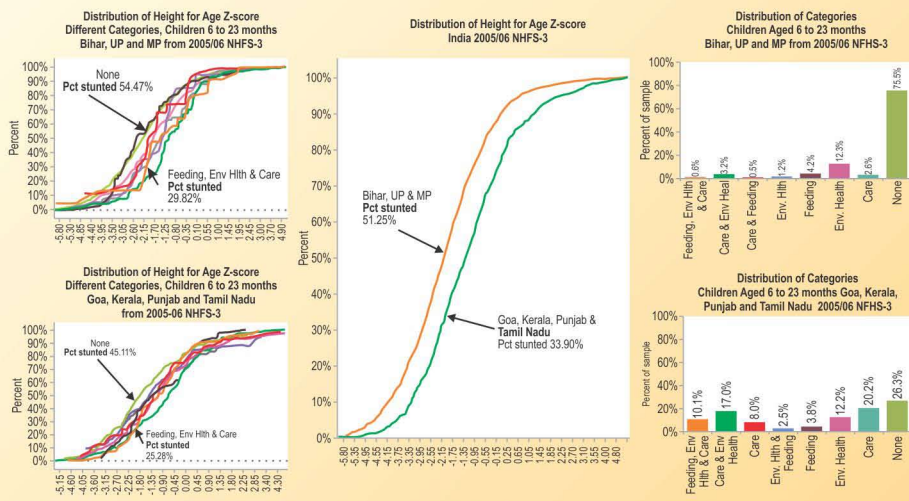
still far from optimum, the proportion of children with adequacy in all dimensions is almost 17 times higher for the group of states with better nutrition levels, than for the other group; and the proportion of children with adequacy for none is three times lower (bar graphs on the right of the figure). Third, nutrition outcomes for those that are adequate in all dimensions and adequate in none are not drastically different between the two groups of states (height-for-age distribution curves in the left panel of Figure 7).

This strong association between nutrition outcomes and the adequacy of food, care, and environmental health suggests that it is critical to ensure that this full package reaches every mother and child during the narrow window of opportunity.

Policy Notes # 7 and 8, argue that the Health and Agriculture sectors can and must play a greater role in improving nutrition. Policy Note# 7, 'Role of health systems in improving childhood nutrition in India' by Rajani R. Ved and Anuradha Jain, maps the institutional mechanisms within the existing health programs and examines key gaps to be filled, areas to be strengthened and the opportunities to be exploited for the health system to effectively impact undernutrition.

Policy Note# 8, 'Pro-nutrition agriculture in India: entry points and policy options' by S. Mahendra Dev and Suneetha Kadiyala, discusses pathways through which measures—operating through the agricultural sector—can target the triad of immediate causes *food-care-environmental health*, as well as the underlying causes of undernutrition. It suggests three key entry points, inclusive

Figure 7: Distribution of stunting in children 6-23 months old according to adequacies of feeding-care-environmental health, selected states



Note: These data sets are available at www.worldbank.org/safansi (under the link Adequacy of Food, Health and Care). The dashboards provided allow users to create graphs according to selected parameters of their choice.

Source: Created by World Bank using NFHS-3 data.

agriculture growth, improving quality of diets, and empowerment of women, by way of which agricultural policies can impact nutrition.

Gender as a key contributor: Gender is a strong influencer of all the three categories discussed above that directly impact nutrition, and it does so through several pathways. The status of women, particularly their health and nutrition status, not only during pregnancy and birthing but over their entire childhood and young lives, and its association with low birth weight babies contributes to the much higher levels of undernutrition in South Asia as compared to sub-Saharan Africa—the so-called ‘South Asian Enigma’.[4]

The crucial role of gender is discussed as a cross-cutting theme across policy notes. For example, the role of mother’s education and the higher levels of undernutrition in women is discussed in Policy Note# 5; the age of marriage and child bearing and its association with low birth weight and birth size is explored in Policy Note# 2; the high incidence of low birth weight and the role of maternal nutrition is highlighted in Policy Notes 3, 4 and 8; and women’s empowerment, their knowledge, support and capacity to feed, care and access health services for themselves and their young children are addressed in Policy Notes 4, 5, 6, 7, 8, 9 and 10.

Are there then any examples or success stories, international or from within the country, where effectively

addressing these determinants has improved nutrition? The following section outlines the two policy briefs that speak to this question.

Addressing the key determinants: Lessons from selected best practices

There are countries that have achieved sustained improvements in nutrition by addressing its immediate and basic causes using a mix of approaches—direct interventions as well as broad-based policy instruments to address issues such as poverty and inequality. Policy Note# 9, ‘International success stories in reducing undernutrition: strategic choices, policy actions and lessons’ by Sheila Vir, draws upon case studies from three such developing countries—Thailand, Brazil and Vietnam. The note identifies that while each country used its own set of policies, strategies and approaches to address undernutrition, there are common elements, such as commitment of leadership coupled with significant investments in nutrition; broad-based policies and approaches to address poverty and inequities combined with delivery of direct nutrition interventions, including maternal nutrition at scale, which contributed to success.

Whereas the overall performance of past policies and programs in India has been less than impressive, there are examples of innovations within India’s flagship nutrition

program, the Integrated Child Development Services (ICDS) that have demonstrated significant improvements in the nutritional status of children. Policy Note#10, 'Best practices in the Integrated Child Development Services (ICDS) program: some lessons for its restructuring and strengthening' by Ashi Kohli Kathuria, discusses four such *best practices* and examines the critical components and factors that possibly led to their success in improving nutrition. Since the best practices were implemented through the existing system and functionaries, albeit with additional support, they establish an important fact—if well supported, it is possible for the ICDS to have an impact on nutrition. Lessons derived from these best practices are especially relevant to the ongoing efforts for restructuring and strengthening of the national ICDS program.

To conclude, India must take urgent and comprehensive action to overcome the challenges and constraints that have thus far impeded progress in improving the nutrition of its women and children. Effective interventions to improve nutrition are available and there is now considerable consensus around these. However, there are huge inadequacies of the triad of food, care and environmental health—the key determinants of undernutrition. Moreover, the coverage of the full set of effective nutrition interventions, targeted at the narrow window of opportunity, is poor.

Taking cognizance of these issues, the Prime Minister's National Nutrition Council has charted the future directions for India's national response to nutrition through four key recommendations. These are to:

- (i) Strengthen and restructure the ICDS program to enable a special focus on pregnant/nursing mothers and children under three, provide flexibility for local action, and forge institutional convergence with other national programs in the health and sanitation, particularly at the district and village level;
- (ii) Design a multi-sectoral plan in 200 high burden districts with institutional mechanism to converge with the various national programs at the state, district, block and village level;
- (iii) Implement a nation-wide information, education and communication campaign against malnutrition to address issues of status of women, the care of pregnant mothers and children under two, breastfeeding, and the importance of balanced nutrition, health, hygiene and sanitation; and
- (iv) Ministries and departments of Health, Drinking Water Supply and Sanitation, School Education, Agriculture and Food and Public Distribution to bring strong nutrition focus to their programs.

The recommendations could, if backed by adequate resources and implemented well, transform India's nutrition situation.

¹UNICEF and the Micronutrient Initiative. 2004. Vitamin and Mineral Deficiency: a Global Progress Report.

²World Bank. 2009. World Development Indicators (Database)

³The methodology for calculating nationwide costs of vitamin and mineral deficiencies, and interventions included in the cost of scaling up, can be found at: www.worldbank.org/nutrition/profiles

⁴A large proportion of anemia is due to a deficiency of iron. Anemia increases susceptibility to infections, reduces concentration (thus learning in school) and work capacity, thereby affecting productivity

⁵WHO. 2009. Global Prevalence of Vitamin A Deficiency in Populations at Risk 1995–2005. WHO Global Database on Vitamin A deficiency.

⁶UNICEF. 2009. Tracking Progress on Child and Maternal Nutrition.

REFERENCES:

- [1] Arnold F, Parasuraman S, Arokiasamy P, Kothari M. 2009. Nutrition in India. 2009; International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS-3), 2005–06: India: Volume I. Mumbai: IIPS. Calverton, Maryland, USA: ICF Macro (NFHS-3) Nutrition report.
- [2] World Bank, Repositioning nutrition as central to development: a strategy for large scale action. Washington DC, USA: The World Bank; 2006.
- [3] The Lancet. Maternal and Child Undernutrition; Special Series; Jan, 2008.
- [4] Ramalingaswami V, Jonsson U, Rohde J. The Asian enigma, the progress of nations. UNICEF 1996.

For further information on 'Nutrition in India' contact Ashi Kohli Kathuria at akathuria1@worldbank.org

Editors: Gerard La Forgia, Lead Specialist, HNP Unit, The World Bank; and Krishna D. Rao, Public Health Foundation of India, New Delhi.

India Health Beat is produced by the Public Health Foundation of India and the World Bank's Health, Nutrition and Population unit located in Delhi. The Notes are a vehicle for disseminating policy-relevant research, case studies and experiences pertinent to the Indian health system. We welcome submissions from Indian researchers and the donor community. Enquiries should be made to Nira Singh (nsingh2@worldbank.org).

Disclaimer: The views, findings, interpretations and conclusions expressed in this policy note are entirely of the authors and should not be attributed in any manner to the World Bank, its affiliated organizations, members of its Board of Executive Directors, the countries they represent or to the Public Health Foundation of India and its Board of Directors.