

# Myths and Realities of Child Nutrition

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In his article Arvind Panagariya argues that (a) the prevailing narrative of child malnutrition being worse in India “than nearly all Sub-Saharan African countries with lower per capita incomes” is false, (b) that this notion is an “artefact of a faulty methodology”, and (c) that the nutrition situation and recent trends in India are not so bad anyway.

The apparent motivation for the paper was the author’s perception that malnutrition statistics were becoming increasingly wielded as a political weapon by critics of India’s economic policy reforms. He suggests that India’s “otherwise measured” Prime Minister Manmohan Singh was misguided in stating that “the problem

of malnutrition is a matter of national shame” in early 2011.

But there are several major flaws in his argument, which I describe here.

## 1 Understanding the Problem

In addressing the basic thesis of the paper, let us start with the question of what is required for an adequate nutritional status. The phrase “balanced diet” is mentioned no fewer than 22 times in this regard but nutrition is of course far more than this. In brief, the nutritional status of an individual is driven by various interacting factors and processes which play out at different levels and over different time spans, as clearly depicted in the United Nations Children’s Fund (UNICEF) 1990

conceptual framework (universally applied within the international nutrition community but not referenced in this article). At an immediate level, an individual’s dietary intake interacting with her/his health status is paramount, but these variables are themselves determined by underlying household and community-level drivers (including food security, health service access, water and sanitation and child caring capacity and practices), and more structural drivers relating to the amount, control and use of various types of resources at national levels. Environments in which the basic social, economic and political conditions are broadly favourable to nutrition have been referred to as “enabling environments”. By contrast, such macro-level conditions or environments may be neutral or disabling for nutrition.

On its own therefore a “balanced diet” clearly cannot ensure nutritional well-being. Further misperceptions in the paper relate to the view that nutritional status can only be determined by individual medical check-ups (p 99), that

protein deficiency is a major part of the problem (pp 99, 110), and that the medical infrastructure is the key underlying requirement for nutrition. Moreover, unlike food, you cannot “give nutrition” (p 102) just as you cannot give health. We will return to aetiology at the end of this commentary to try to understand what is actually happening to nutrition in India.

## 2 Comparing Trends

Panagariya assumes that trends in nutritional outcomes should mirror those of mortality and other health indicators, and where they do not it must be because the measurement of nutritional status is wrong. But why should apples look like oranges? Mortality data measure mortality and anthropometric data measure child growth. India may be significantly better than many Sub-Saharan African countries at keeping children alive, but survival does not automatically equate with adequate nutrition and growth. Even though mortality trends in the long term may be similar to trends in nutrition, they are absolutely not on parallel tracks – there are many possible reasons why nutritional status (determined by multiple causes, as described) does not mimic trends in mortality.

The fact that Chad and the Central African Republic have similar stunting prevalences to India’s but much worse mortality and life expectancy data does not in any way invalidate the means for assessing nutritional status in India. Nor does a similar comparison between Kerala and Senegal and Mauritania, or between India and 33 poorer Sub-Saharan African countries.

## 3 Assessing Nutritional Status

How nutritional status is assessed is the crux of Panagariya’s article so we need to dig further,<sup>1</sup> starting with this quote from page 98:

The central problem with the current methodology is the use of common height and weight standards around the world to determine malnourishment, regardless of differences that may arise from genetic, environmental, cultural, and geographical factors. Though medical literature recognises the importance of these factors, the World Health Organisation (WHO) totally ignores them...

This is not true. Of course the World Health Organisation (WHO) recognises these factors will vary. But what is most important is to know how they vary, and what this means for the assessment of nutritional status. The key point is that there are differences in genetic potential *between individuals within any population*, while other environmental factors will differ *within and between populations*. Unlike environmental factors, individual genetic potential does not differ *between populations*. The whole point of standards is to understand how the environment, broadly defined, is affecting the growth of children.

The basis for WHO’s adoption of the current growth standard, following the Multicentre Growth Reference Study (MGRS) involving 8,440 sampled children, was *evidence* (not “assumptions”) that had been exhaustively reviewed by numerous experts and governments over many years. At the bottom of page 107 the author writes “Therefore, what is needed is evidence that some sub-populations of children born and raised within India have managed to entirely eliminate the gap with respect to the WHO 2006 population. That evidence has remained elusive so far...” In fact, the evidence is right there in the multi-country study itself, as India was one of the six countries to provide sites. As shown by Figure 1 of the study (WHO 2006), the growth of Indian children in the sample matched that of children from Norway, US, Brazil, Ghana and Oman.<sup>2</sup>

Much earlier, another classic study by the Nutrition Foundation of India (Agarwal et al 1991) concluded that Indian children properly cared for grew similarly to the international National Centre for Health Statistics (NCHS) reference population. Indeed, based on this study, India decided to start using the NCHS reference population.

Continuing with the paper, on p 103:

Central to the present critique is a challenge to the assumption that the provision of a fully balanced diet will eliminate the height and weight differences between the population of Indian children and the healthiest existing population of children anywhere, which is currently represented by the WHO reference population.

I do not know anyone in the nutrition profession who holds this assumption.

Again, food and nutrients alone cannot solve the under-nutrition problem. Many more factors and processes are involved. For many years the nutrition community has been calling for a broader multi-sectoral response to nutrition that includes, at a minimum, health, water and sanitation, women’s empowerment, social protection and agriculture sectors delivering interventions that create enabling underlying conditions for nutrition security.

The article does suggest that a portion of the high levels of stunting in India may be due to a process of “gradual catch-up” still having some way to go. But the main contention is that Indian children are genetically smaller and shorter than other children so that “even after the population has fully eliminated the “catch-up” deficit after several generations of a balanced diet, it will still fall short of reproducing the reference population” (p 103).

On page 104, the author cites a study by Tarozzi (2008) that shows high levels of stunting among the highest wealth quintile in an Indian population, as another pillar in his challenge to international growth standards. But again, levels of stunting could still be high among better-off families if a core driver of these levels is not so affected by their relative wealth and/or if intergenerational “gradual catch-up” still has a long way to go. As we will see later, both of these possible reasons are likely to pertain.

Later, on page 106, comparisons are made between Moroccan and Dutch children both living in the Netherlands without any controlling for other socio-economic or environmental factors that may relate to growth rate. Could it be that Moroccan children are different from Dutch children with regard to such factors? On page 107, a comparison is made between Mayan-American and US children to show that the height gap has narrowed but not vanished. But how many generations were taken into account? How many generations will it take for catch-up to run its course? This will differ between population groups depending on the nutrition-relevant conditions in which generations of their forebears grew up in.

The possibility of a longer term catch-up is floated on page 107: “from a policy standpoint, what sense does it make to attribute differences in height and weight that can only be bridged over future generations to malnourishment?” But is this really suggesting caution in attributing cause to effect because it is not amenable to a quick policy fix?

Finally on page 107, reviewing Tarozzi’s (2008) study conclusion of evidence to support an international growth standard, the author is absolutely correct in stating: “Even if it were true that the height gap between Indian children born in the UK and their white counterparts is nil, it does not prove that at some point in time Indian children born and brought up in India will also close the gap.” Closing the gap will require addressing a range of factors and processes that drive nutrition outcomes in India, as discussed above and in more detail below.

The bottom line is there is no genetic reason for cross-country differences in child stunting prevalences. Children from diverse ethnic groups grow very similarly when their physiological needs are met and environments support healthy development. This has been repeatedly shown ever since the “small but healthy?” hypothesis of David Seckler was roundly rebutted back in the 1980s (Seckler 1982; Gillespie and McNeill 1992). To quote the WHO 2006 study conclusion: “the new standards confirm that children born anywhere in the world and given the optimum start in life have the potential to develop to within the same range of height and weight”.

#### 4 Comparing Child Stunting Data

The article does not appear to reflect the current comparative nutritional situation between India and Sub-Saharan Africa. Of the 34 “highest-burden countries” (that collectively account for 90% global stunting), 22 are in Africa, according to the WHO Global Database on Child Growth and Malnutrition. India’s latest nationally representative data from 2005-06 show that 48% young children were stunted – a total of 60.6 million children who represent 36% of the global total.

If we draw a line at 40% stunting prevalence, we find a total of 17 countries have stunting rates above 40% – five from south Asia (including India), 10 from Sub-Saharan Africa and two others (Yemen and Guatemala). The conclusion here is that, using the most recent data, south Asia is broadly similar to Sub-Saharan Africa in terms of child stunting prevalence, though of course India’s overall child stunting burden is far higher due to its population size, and India is a significantly richer country than most countries in Africa.

If we now compare past *trends*, the WHO has pointed out in several publications that the prevalence of child under-nutrition (whether underweight or stunting) is improving in Asia as a whole, while stagnating or deteriorating in Sub-Saharan Africa (de Onis et al 2011). Reviewing India’s own trend, a decline from 43% to 40% child underweight over a seven-year period (1998-2005) is statistically an improvement. But for a country that has experienced an economic boom over this same period, it is *not* a positive trend.

#### 5 Why Nutrition Is Important<sup>3</sup>

Finally, the paper casts doubt on the adverse cognitive consequences of stunting (footnote 14, p 111). The evidence however is now very strong and has been a large factor in nutrition being seen as one of the most cost-effective development interventions by the Copenhagen Consensus panel of eminent economists (Horton et al 2008). A recent study by Spears (2011) has also shown that taller children perform better on average on tests of cognitive achievement, in part because of differences in early-life health and net nutrition.<sup>4</sup>

Improved nutrition is instrumental in improvements in other social objectives as well as improved cognitive ability. The global evidence on this is given a brief acknowledgement in the paper but then declared unimportant because, after all, India has been able to achieve economic gains (p 109). But, in fact, evidence from India is fully consistent with global research. For example, using data that included an Indian cohort Martorell et al (2010) showed that early childhood

weight gain predicted later schooling; Adair et al (2013) use these longitudinal data to confirm the strong relationship of linear growth to adult human capital. Similarly, using data from India, Pelletier et al (1994) showed that under-nutrition was a major risk factor for mortality; and children who were lower than the international reference but not considered seriously malnourished contributed the larger share of child deaths since they dominated the population (even though the relative risk was greater for severely malnourished children). Alderman et al (2011), using data exclusively from India, show that this risk pattern still persists after controlling for socio-economic status.

Even if it was scientifically justified, re-norming nutritional data would not change the distribution or the relative disadvantage of those with poor nutrition. Lowering the bar might mean that more children cross it, but would not change the fact that those who go higher do best.

#### Reality of Child Nutrition in India

The question of what lies behind the high rates of under-nutrition in India, that persist against a backdrop of sustained economic growth, has been considered an enigma for many years (Ramalingaswami et al 1996; Smith et al 2003). Yet, from what we now know about what drives under-nutrition, the situation is perhaps not so enigmatic. As Menon (2012) has pointed out, where poor diets coexist with high incidence of infections, poor maternal nutritional status, female disempowerment, high socio-economic inequity, pervasive poverty, poor health services, very poor sanitation and weak governance the phrase “perfect storm” is perhaps more apt.

Numerous studies have shown that a key issue in India is that infants begin life with a disadvantage due to poor intrauterine growth. At birth one-third of Indian infants are underweight and 20% are stunted (Mamidi et al 2011; Ramachandran and Gopalan 2011). Combining the nutritional deficits already suffered at birth with those that develop within the first two years of life will account for most under-nutrition in India. What happens, or does not happen, in the

crucial 1,000 day “window of opportunity” (pregnancy plus first two years of a child’s life) will continue to drive the nutritional statistics in India, or in any other country. Indeed, in India, the pre-pregnancy period is a critical time too, as the health and nutrition of girls and women is poor, well before they enter their pregnancies.

As a basic driver, the low socio-economic status of women in India is also a major factor. Often uneducated and often still teenagers, many Indian mothers have little control over decisions and resources within households. Studies have shown (e.g., Smith et al 2003) that African women tend to have more control over household budgets.

There is one other factor that has been recently highlighted as a major contributing factor to differences in child nutritional status between India and Sub-Saharan Africa. This is that 53% of the Indian population defecates in the open (Government of India 2012), a significantly higher proportion than in Sub-Saharan Africa. Combined with the far higher population density in India this represents a double threat. A recent analysis has demonstrated a quantitatively important gradient between child height and sanitation that can statistically explain “much or all of the excess stunting in India” (Spears 2011).

In conclusion, though there are some signs of positive change, India continues to have a high burden of child undernutrition – driven by a range of persistent and pervasive determinants that play out and interact at different levels. In keeping track of the nutritional status of India’s young children, WHO-recommended child growth standards are entirely applicable, as they are to young children from any other country.

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#### NOTES

[I am grateful to Harold Alderman and Purnima Menon for their feedback on an earlier draft of this comment.]

1 I restrict my discussion to children, as the WHO standards relate to the growth patterns of children prior to the pre-pubertal or adolescent growth spurts.

- 2 The study summary states: “The MGRS is unique in that it was purposely designed to produce a standard by selecting healthy children from diverse ethnic backgrounds living under conditions likely to favour the achievement of their full genetic growth potential. Furthermore, the mothers of the children selected for the construction of the standards engaged in fundamental health-promoting practices, namely breastfeeding and not smoking.”
- 3 The reader is referred to the forthcoming *Lancet Nutrition Series* (to be released on 6 June 2013) for a thorough compendium of state-of-the-art reviews on the global nutrition situation, causes, consequences and potential responses.
- 4 Recent research documenting this height – achievement slope has primarily focused on rich countries. Using data from the India Human Development Survey, Spears (2011) shows that the height achievement slope in India is more than twice as steep as in the US. Being one standard deviation taller is associated with being 5 percentage points more likely to be able to write, a slope that falls only to 3.4 percentage points controlling for a long list of contemporary and early-life conditions.

#### REFERENCES

- Adair, Linda et al (2013): “Disentangling How Relative Weight Gain and Linear Growth during Early Life Relate to Adult Health and Human Capital in Low and Middle Income Countries: Findings from Five Birth Cohort Studies”, *Lancet*, forthcoming
- Agarwal, K N et al (1991): “Growth Performance of Affluent Indian Children”, Nutrition Foundation of India, Scientific Report No 11.
- Alderman, Harold, Michael Lokshin and Sergiy Radyakin (2011): “Tall Claims: Mortality Selection and the Height of Children in India”, *Economics and Human Biology*, Volume 9, Issue 4, December, pp 393-406.
- De Onis, Mercedes, M Blossner and E Borghi (2011): “Prevalence and Trends of Stunting among Pre-school Children, 1990-2020”, *Public Health Nutrition*, 1-7.
- Gillespie, Stuart and G McNeill (1992): *Food, Health and Survival in India and Developing Countries* (New Delhi: Oxford University Press).
- Government of India (2012): *Census of India 2011: Houses, Household Amenities and Assets*, Government of India.
- Horton, Susan, H Alderman and J Rivera (2008): “Hunger and Malnutrition”, Copenhagen Consensus Center.
- Mamidi, R S, P S Shidhaye, K V Radhakrishna, J J Babu and P Sudershan Reddy (2011): “Pattern of Growth Faltering and Recovery in Under Five Children in India using WHO National Standards – A Study on First and Third National Family Health Surveys”, *Indian Paediatrics*, 15 March, 1-6.
- Martorell, Reynaldo, B L Horta and L S Adair (2010): “Weight Gain in the First Two Years of Life is an Important Predictor of Schooling Outcomes in Pooled Analyses from Five Birth Cohorts from Low- and Middle-Income Countries”, *J Nutr* 2010; 140: 348-54.
- Menon, Purnima (2012): “Childhood Undernutrition in South Asia: Perspectives from the Field of Nutrition”, *CESifo Economic Studies*, Vol 58, 2/2012, 274-95.
- Panagariya, A (2013): “Does India Really Suffer from Worse Child Malnutrition Than Sub-Saharan Africa?”, *Economic & Political Weekly*, 48(18): 98-111.
- Pelletier, David, E Frongillo, D Schroeder and J-P Habicht (1994): “A Methodology for Estimating the Contribution of Malnutrition to Child Mortality in Developing Countries”, *Journal of Nutrition*, 124(10), 2106S-2122S.
- Ramachandran, Prema and H S Gopalan (2011): “Assessment of Nutritional Status in Indian Preschool Children Using the WHO 2006 Growth Standards”, *Indian Journal of Medical Research*, 134, 47-53.
- Ramalingaswami, V, U Jonsson and J Rohde (1996): “Commentary: The Asian Enigma”, *The Progress of Nations 1996*, UNICEF, New York.
- Seckler, David (1982): “Small But Healthy: A Basic-Hypothesis in the Theory, Measurement and Policy of Malnutrition”, published in P V Sukhatme (ed.), (1982), *Newer Concepts in Nutrition and Their Implications for Policy*, Maharashtra Association for the Cultivation of Science Research Institute, Pune.
- Smith, Lisa, U Ramakrishnan, A Ndiaye, I Haddad and R Martorell (2003): “The Importance of Women’s Status for Child Nutrition in Developing Countries”, Research Report 131, International Food Policy Research Institute, Washington DC, US.
- Spears, Dean (2011): “Height and Cognitive Achievement among Indian Children”, *Economics and Human Biology*, viewed on 10 May 2013 (<http://works.bepress.com/spears/2>).
- Tarozzi, Alessandro (2008): “Growth Reference Charts and the Status of Indian Children”, *Economics and Human Biology*, 6 (3), pp 455-68.
- UNICEF (1990): “Strategy for Improved Nutrition of Women and Children in Developing Countries”, UNICEF, New York.
- WHO (2006): “Assessment of Differences in Linear Growth among Populations in the WHO Multi-centre Growth Reference Study”, *Acta Paediatrica*, Suppl, 450: 56-65.

## Survey

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### Experimental Economics: A Survey

by

*Sujoy Chakravarty, Daniel Friedman, Gautam Gupta, Neeraj Hatekar, Santanu Mitra, Shyam Sunder*

Over the past few decades, experimental methods have given economists access to new sources of data and enlarged the set of economic propositions that can be validated. This field has grown exponentially in the past few decades, but is still relatively new to the average Indian academic. The objective of this survey is to familiarise the Indian audience with some aspects of experimental economics.

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