

# **India's Malnutrition Enigmas: Why They Must Not Be a Distraction from Action**

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## **Introduction**

An enigma is something that is mysterious or puzzling. India currently has two such enigmas in nutrition: (1) why are stunting rates so much higher in India than in many countries of sub-Saharan Africa which are poorer and have higher mortality rates? And (2) why is the level of stunting so persistent in the face of rapid economic growth? This short paper reflects on these two enigmas and discusses their implication for action.

## **Enigma 1: India's high stunting rates relative to Sub-Saharan Africa**

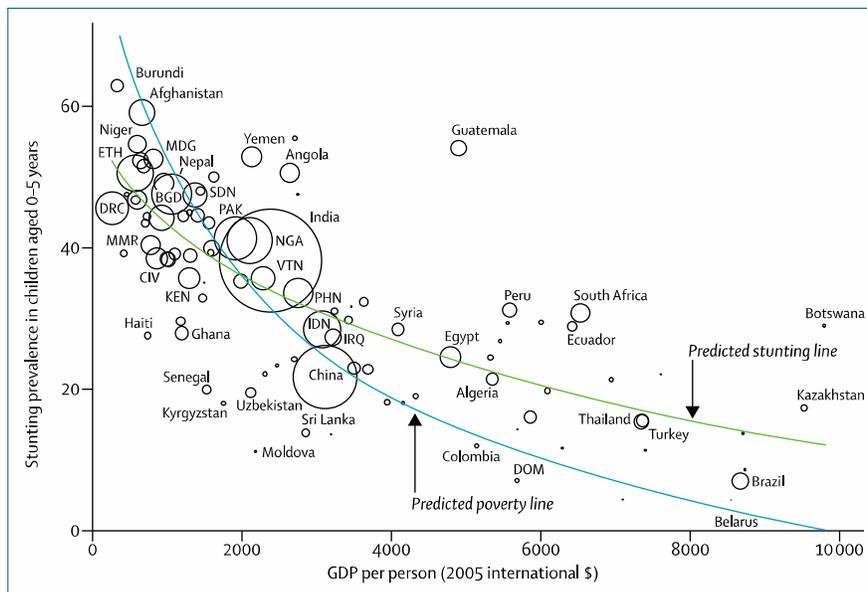
India is home to approximately 40% of the world's stunted children and has the fifth highest stunting rate in the world.<sup>2</sup> For its GDP per capita, India's stunting is higher than would be predicted, although not by a great extent. In the context of Figure 1 this places India above the green predicted stunting line, together with Nigeria and Pakistan. In contrast, Brazil, China and Ethiopia, other large countries, are all below the line.

## **Figure 1: Prevalence of stunting in children aged 0-5 years and GDP per person**

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<sup>1</sup>I would like to thank Ramanan Laxminarayan and Neha Raykar for their helpful comments on an earlier version. All errors are mine.

<sup>2</sup> UNICEF. 2013. IMPROVING CHILD NUTRITION: The achievable imperative for global progress. UNICEF. New York. USA



Source: Ruel and Alderman (2013)<sup>3</sup>

Why is India doing more poorly than its GDP per capita would predict?  
 Several hypotheses have been proposed:

1. The international standards do not apply to India. The argument<sup>4</sup> is that because stunting occurs in Indian children from the top household income quintiles the standards must be non-applicable to India. First, note that India is not unusual in having high levels of stunting for the top quintile of households. The UNICEF (2013)<sup>5</sup> Improving Child Nutrition report shows that for the top quintile in South Asia (which India dominates in a population sense) 25% of children under 5 are stunted. The same report also shows that 25% of children from the top quintile in Sub-Saharan Africa are stunted. Nevertheless, are the international standards appropriate for India? The international standards are based on the attained heights of children growing up in a nutritionally supportive environment in 6 countries, one of which is India (WHO 2006)<sup>6</sup>. The authors of the study found no statistical difference between the heights attained by children under the age of 2 in the 6 countries.

<sup>3</sup> Ruel, M. T., & Alderman, H. (2013). Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? *The Lancet*

<sup>4</sup> See Panagariya 2013 on this proposition (Panagariya, A. (2013). Does India Really Suffer from Worse Child Malnutrition Than Sub-Saharan Africa?. *Economic & Political Weekly*, 48(18), 99) and Gillespie 2013 for a rebuttal <http://www.transformnutrition.org/2013/01/24/when-myth-is-reality/>

<sup>5</sup> UNICEF. 2013. IMPROVING CHILD NUTRITION: The achievable imperative for global progress. UNICEF. New York. USA

<sup>6</sup> De Onis, M., Onyango, A. W., Borghi, E., Garza, C., & Yang, H. (2006). Comparison of the World Health Organization (WHO) Child Growth Standards and the National Center for Health Statistics/WHO international growth reference: implications for child health programmes. *Public health nutrition*, 9(7), 942.

Can we reject the hypothesis that the Indian children from these healthy backgrounds attain a lower height than children from the other 5 countries from similar backgrounds? Yes. There is another possible line of argument: how long would it take the healthy environment to work its magic on height of children under the age of 5? A recent review of the human and animal evidence (Martorell and Zongrone 2012) concludes that “nearly normal lengths can be achieved in children born to mothers who were malnourished in childhood when profound improvements in health, nutrition and the environment take place before conception”.<sup>7</sup> Such profound changes might be beyond public policy, but this has nothing to do with standards.

2. Open defecation is responsible for the difference. India has one of the highest open defecation rates in the world at nearly 50%, much higher than for sub-Saharan Africa (Chambers and Medeazza 2013).<sup>8</sup> Econometric research by Spears (2013)<sup>9</sup> suggests this is responsible for a “large proportion” of the stunting gap (they do not say exactly how much). This research is careful and plausible. More econometric work needs to be done before we can have complete confidence in such conclusions but the work is highly suggestive.

3. Women’s status is low in India. One of the largest differences between India and SSA is the status of women relative to men. The ability to make decisions and command resources, underpinned by rights is a development outcome in itself and is vital to many other development outcomes, including child nutrition. Smith and Haddad (2000)<sup>10</sup> show that the ratio of female to male life expectancy at birth, greater than 1 for all Sub-Saharan countries, is less than one for India, reflecting, they hypothesise, underinvestment in the health of girls. A study by Smith et. al. (2003) using multiple DHS data sets found that a large proportion of the difference between India and SSA underweight is due to differences in women’s status, even after controlling for female education, and other determinants of nutrition status. A recent within-India study using NFHS 2005/6 data by Arulampalam et. al. (2012)<sup>11</sup> found that a comprehensive measure of maternal autonomy has a positive significant association with stunting and wasting for children under 3.

4. Son preference in India is very strong. A new paper by Jayachandran and Pande (2012)<sup>12</sup> suggests that much of the difference is due to birth order and son preference. Again, using multiple DHS data sets, they find no statistical

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<sup>7</sup> Martorell, Reynaldo, and Amanda Zongrone. "Intergenerational influences on child growth and undernutrition." *Paediatric and Perinatal Epidemiology* 26.s1 (2012): 302-314.

<sup>8</sup> Chambers, Robert, and Gregor von Medeazza. "Sanitation and Stunting in India." *Economic & Political Weekly* 48.25 (2013): 15.

<sup>9</sup> Spears, D. 2013. How Much International Variation in Child Height Can Sanitation Explain?. Policy Research Working Paper 6351. World Bank. February.

<sup>10</sup> Smith, L.C., and L. Haddad. Explaining child malnutrition in developing countries: A cross-country analysis. Vol. 60. Intl Food Policy Res Inst, 2000.

<sup>11</sup> Arulampalam, W, A. Bhaskar and N. Srivastava. 2012. Does greater autonomy among women provide the key to better child nutrition? University of Warwick Economics Department Working Paper.

difference between standardised height of age scores between first born children in India versus 25 SSA countries. In fact, for first-born sons height for age is higher than in SSA. If this result holds up under further more rigorous statistical testing it makes it even more difficult to support the genetic difference hypothesis—why would genes only express themselves differently in children of birth order 2 and above? Their analysis shows that that compared to SSA mothers, Indian mothers are less likely to want children above birth order 2. They also present data that show associations between nutrition related investments in children and the sex of the baby. Whether the eldest (first born) is a boy or girl does not affect pre birth investments (when sex is not known, when it is known there is evidence from Bharadwaj and Lakdawala (2013)<sup>13</sup> that discrimination against girls begins in the womb), only post birth, when boys are favoured. This work is interesting, but not yet conclusive as confounding factors need to be further addressed.

## **Enigma 2: India's stubborn stunting levels in the face of rapid economic growth**

In most countries, stunting rates decline with income growth (Masset and Haddad 2013<sup>14</sup>, Ruel and Alderman 2013<sup>15</sup>). The rate at which they decline varies, but for India, with its strong income growth over the past 15 years, NFHS data show that stunting is declining very slowly--at a rate of 0.77 percentage points between 1992 and 2005. By way of comparison, Bangladesh, which has grown more slowly in economic terms, has shown a decline of 2.47 percentage points between 2004 and 2007 (Macro International StatCompiler database)<sup>16</sup>. Many researchers (e.g. Subramanyam et. al. 2011<sup>17</sup>) cannot even find a statistically significant independent link between India's GDP and child undernutrition.

In many ways this is the more important enigma. We can argue about the levels all we want, but what is most important is how to bring them down? It is more puzzling too. While inequality is increasing,<sup>18</sup> growth seems to be

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<sup>12</sup> Jayachandran, Seema, and Rohini Pande. "The Puzzle of High Child Malnutrition in South Asia." presentation slides." *International Growth Centre* (2012).

<sup>13</sup> Bharadwaj, Prashant, and Leah K. Lakdawala. "Discrimination begins in the womb: evidence of sex-selective prenatal investments." *Journal of Human Resources* 48.1 (2013): 71-113.

<sup>14</sup> Masset, E. and L. Haddad. The relationship between stunting and income: A critical review. Paper for the OECD. IDS Sussex.

<sup>15</sup> Ruel, M. T., & Alderman, H. (2013). Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? *The Lancet*

<sup>16</sup> <http://www.statcompiler.com/>

<sup>17</sup> Subramanyam MA, Kawachi I, Berkman LF, Subramanian SV (2011) Is Economic Growth Associated with Reduction in Child Undernutrition in India? *PLoS Med* 8(3): e1000424. doi:10.1371/journal.pmed.1000424

<sup>18</sup> Ghosh, J. 2010. Poverty reduction in China and India: Policy implications of recent trends

DESA Working Paper No. 92 DWP/92. January

translated into poverty reduction, and indeed poverty reduction is happening rapidly (Haddad 2011)<sup>19</sup>.

1. Open defecation. Here, the above hypotheses also come into play. If open defecation is so widespread, the environmental hazard consequences will be difficult for all but the richest to protect themselves from (there is some evidence of this in Spears 2013). Income may go up, and more and better nutrition inputs may be bought, but if infection exposure cannot be diminished sufficiently then their effectiveness will be undermined. Similarly if gender relations are unequal, rising income does not mean that equality will improve, thus again undermining the ability of women to control fertility and equalise nutrition inputs to boys and girls.

2. Declining food consumption. Additional hypotheses emerge around food consumption: food availability in calories per capita has declined in India, with several explanations put forward: changes in relative prices, demographic patterns, food habits, and calorie requirements (Deaton and Dreze 2009<sup>20</sup>). Smith (2013)<sup>21</sup> hypothesises that it is for a rather more pragmatic reason: the Household Food Consumption Surveys collected by the National Statistical Office do not capture increasing shares of foods purchased outside the home.

3. Inhibition of access to complementary foods for infants. At the infant level, some argue that the market for foods that are complements to breast milk for children in the 7-24 month age range is inhibited through the 1992 Indian Infant Milk Substitutes, Feeding Bottles and Infant Foods Act (Rao 2012).<sup>22</sup> Rao argues that “the prohibitions that apply to advertising and marketing of breastmilk substitutes and infant foods below the age of 6 months also apply to the complementary and weaning foods so essential for proper nutrition and health of children older than 6 months”. As more women enter the labour force as India goes through its demographic dividend (dependency rates decline and the youth bulge enters the labour market) the need for safe complementary feeding products will increase.

4. Underfunded health system. On the health side, the public health system is underfunded and of highly variable quality. In 2000, the WHO rated the Indian health system below Bangladesh and Sri Lanka.<sup>23</sup> Reddy et. al. 2011<sup>24</sup> note that spending on the public health system is low (less than 1% of GDP) and over 80% of health expenditure is out of pocket and has called on the government to increase public sector spending to 6% of GDP by 2020 and to

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<sup>19</sup> Haddad, L. Why India needs a national nutrition strategy. *British Medical Journal*, 343 (2011).

<sup>20</sup> Deaton, A and J Drèze (2009): “Food and Nutrition in India: Facts and Interpretations”, *Economic & Political Weekly*, 14 February.

<sup>21</sup> Smith, L. 2013. The great Indian calorie debate: Explaining rising undernourishment during India’s rapid economic growth. IDS Working Paper. Sussex, UK

<sup>22</sup> Rao, V. (2012). Law on infant foods inhibits the marketing of complementary foods for infants, furthering undernutrition in India. *BMJ: British Medical Journal*, 345.

<sup>23</sup> WHO. Health systems: improving performance. WHO, 2000

<sup>24</sup> Reddy, K. S., Patel, V., Jha, P., Paul, V. K., Kumar, A. K., & Dandona, L. (2011). Towards achievement of universal health care in India by 2020: a call to action. *The Lancet*, 377(9767), 760-768.

act to strengthen the system. Even if incomes increase, if families cannot access improved health care, improvements in nutrition status will lag.

5. Disconnects in agriculture. Finally, India is one of the few countries where no statistical association can be found between agricultural growth and changes in child undernutrition (Headey 2012)<sup>25</sup>. We do not know why this is the case, although we have some hypotheses and too little data (Gillespie and Kadiyala 2012)<sup>26</sup>, but given the importance of agriculture in rural areas, this is an enormous missed opportunity.

### **The double burden of malnutrition: a new enigma?**

Overweight rates and the incidence of diet related non communicable diseases (for which overweight is a risk factor) are increasing rapidly in India (Murray et. al. 2012)<sup>27</sup>. This co-existence of undernutrition and overweight and obesity rates is not unique to India, so we cannot call it an enigma. Unfortunately it is happening all over the world as incomes rise and urbanisation occurs. The growth in the prevalence of overweight and related diseases is a consequence of the consumption of more highly processed food high in sugar, salt and fat, as well as a more sedentary life style. The evidence linking undernutrition early in life and the more rapid onset of overweight and related diseases has strengthened considerably in the past 5 years (Black et. al. 2013)<sup>28</sup>.

As well as a physiological link which plays out over 40 years or so, undernutrition and diet related non communicable diseases have a more immediate political and financial relationship. As the incidence of NCDs grows the pressure on the government will grow to allocate health resources on expensive curative care later in life as opposed to preventative care early in life.

### **The need for intensified action, enigmas or not**

It is easy to let these enigmas get in the way of action. Do we need to resolve them to prioritise where we put our energies? In an ideal world, yes. In the real world, no—there are many things that need to be done and we know what they are and for the most part, how to do them.

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<sup>25</sup> Headey, D. D. (2012). Developmental drivers of nutritional change: A cross-country analysis. *World Development*

<sup>26</sup> Gillespie, S., & Kadiyala, S. (2012). Exploring the agriculture–nutrition disconnect in India. *Reshaping agriculture for nutrition and health*. Washington DC, International Food Policy Research Institute, 173-182.

<sup>27</sup> Murray, C. J., Vos, T., Lozano, R., Naghavi, M., Flaxman, A. D., Michaud, C., ... & Brooker, S. (2013). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380(9859), 2197-2223.

<sup>28</sup> Black, Robert E., Cesar G. Victora, Susan P. Walker, Zulfiqar A. Bhutta, Parul Christian, Mercedes de Onis, Majid Ezzati et al. "Maternal and child undernutrition and overweight in low-income and middle-income countries." *The Lancet* (2013).

My list would include<sup>29</sup>:

- Coverage rates of nutrition specific interventions need to increase: the ICDS can be a platform for this
- Open defecation rates need to decrease. Community led total sanitation is one model for achieving this and there are others.
- Discrimination against young girls must be addressed. Behaviour change among families and nutrition providers needs to occur.
- The health system needs to become more sensitive to the importance of nutrition.
- Universities need to modernise the way in which they teach public health nutrition.
- An Innovation fund in agriculture needs to be established to incentivise ideas on how to improve nutrition through agriculture.

## **Conclusion**

But what a UK researcher thinks should be on the list is beside the point. Indian citizens need to put pressure on their busy Government to do more on nutrition and the Government needs to make it easier for them to do this.

Critically, the government needs to make itself more accountable to its citizens for nutrition. Undernutrition is invisible and irreversible, requiring action on multiple fronts. The Government needs to stick its neck out, appoint a high profile Nutrition Czar, give the Nutrition Council a budget and real coordination power, find ways to build nutrition concerns more explicitly into the NFSB, collect nutrition outcome data on an annual basis, sponsor community scorecards to monitor the performance of ICDS and other nutrition service platforms, revamp the public University curricula on teaching nutrition, fund Indian researchers to find public policy solutions for Indian malnutrition and sign up to the Scaling Up Nutrition (SUN) movement to enhance accountability and learning from others.

Why the Government is not doing some of these things--that is the real enigma of nutrition in India.

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<sup>29</sup> This list draws on Haddad, L. Why India needs a national nutrition strategy. British Medical Journal. 343 (2011).