

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

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India has one of the highest child stunting rates in the world

Country	Year	Stunting prevalence (%)
Timor-Leste	2009–2010	58
Burundi	2010	58
Niger	2011	51
Madagascar	2008–2009	50
India	2005–2006	48
Guatemala	2008–2009	48
Malawi	2010	47
Zambia	2007	45
Ethiopia	2011	44
Sierra Leone	2010	44
Rwanda	2010	44
Pakistan	2011	44
Democratic Republic of the Congo	2010	43
Mozambique	2011	43
United Republic of Tanzania	2010	42
Liberia	2010	42
Bangladesh	2011	41
Central African Republic	2010	41
Nigeria	2008	41
Nepal	2011	41
Guinea	2008	40

Note: The countries in bold are profiled beginning on page 55 of this report.

Source: UNICEF Global Nutrition Database, 2012, based on MICS, DHS and other national surveys, 2007–2011, except for India.

India is home to about 40% of global stunting

FIGURE 5 80 per cent of the world's stunted children live in 14 countries

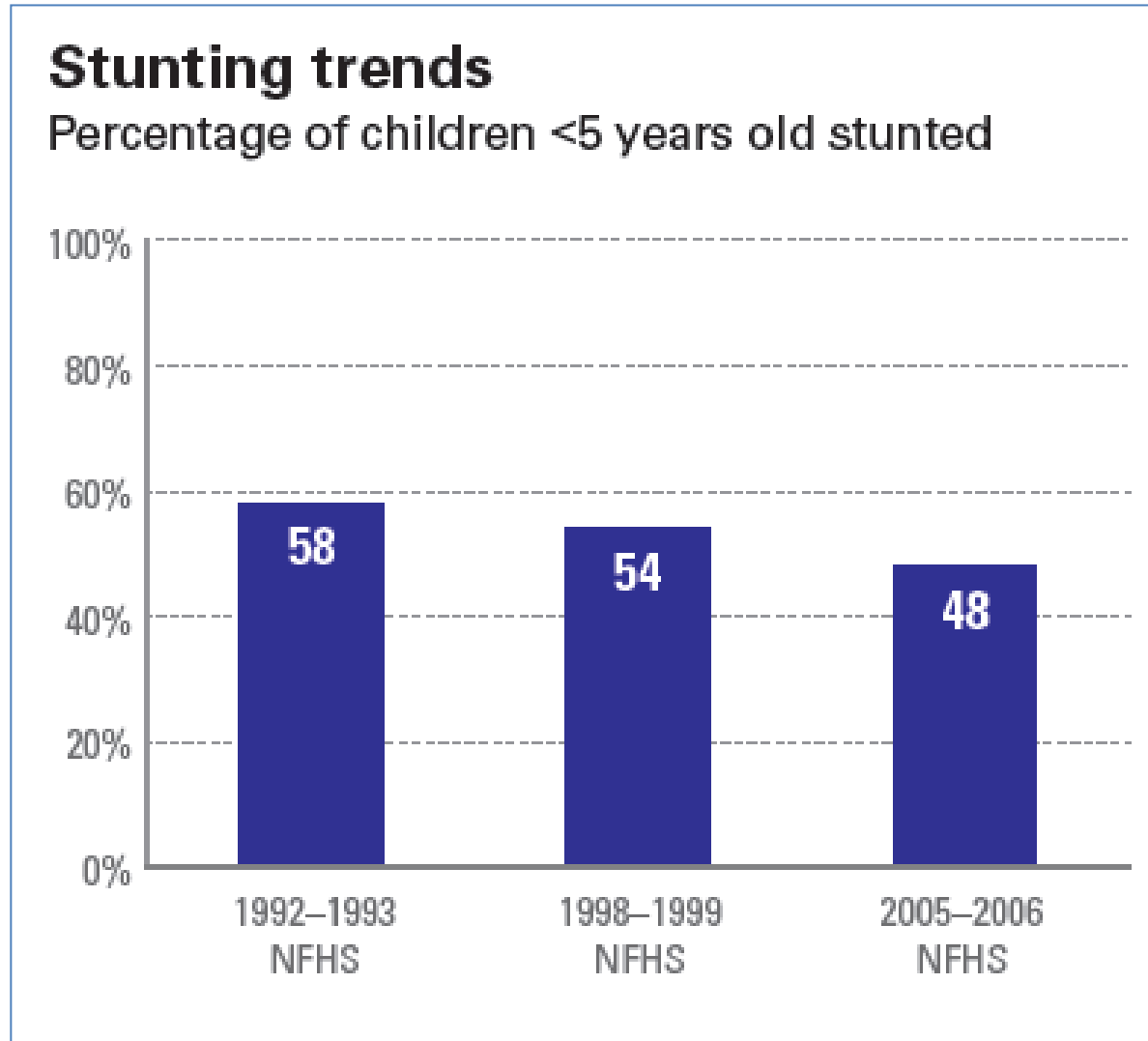
14 countries with the largest numbers of children under 5 years old who are moderately or severely stunted

Ranking	Country	Year	Stunting prevalence (%)	% of global burden (2011)	Number of stunted children (moderate or severe, thousands)
1	India	2005–2006	48	38	61,723
2	Nigeria	2008	41	7	11,049
3	Pakistan	2011	44	6	9,663
4	China	2010	10	5	8,059
5	Indonesia	2010	36	5	7,547
6	Bangladesh	2011	41	4	5,958
7	Ethiopia	2011	44	3	5,291
8	Democratic Republic of the Congo	2010	43	3	5,228
9	Philippines	2008	32	2	3,602
10	United Republic of Tanzania	2010	42	2	3,475
11	Egypt	2008	29	2	2,628
12	Kenya	2008–2009	35	1	2,403
13	Uganda	2011	33	1	2,219
14	Sudan	2010	35	1	1,744

Note: The countries in bold are profiled beginning on page 55 of this report. Updated data from Afghanistan and Yemen were not available, but these countries are likely to contribute significantly to the global burden of stunting – last reported data of stunting prevalence were 59 per cent for Afghanistan in 2004 and 58 per cent for Yemen in 2003.

Source: UNICEF Global Nutrition Database, 2012, based on MICS, DHS and other national surveys, 2007–2011, except for India. Lawrence Haddad, IDS Sussex

Trends in child undernutrition in India are not inspiring given rapid economic growth



Outline

- Indian stunting rates are higher than Africa's and have a weak connection to economic growth
- 10 possible causes?
 1. International growth standards do not apply to India
 2. Son preference
 3. First child preference
 4. High levels of open defecation
 5. Poor status of women
 6. Disconnects between agriculture and nutrition
 7. Declining calorie consumption
 8. Undersupply of complementary infant feeding products
 9. Nutrition interventions are not effective
 10. Weak nutrition governance

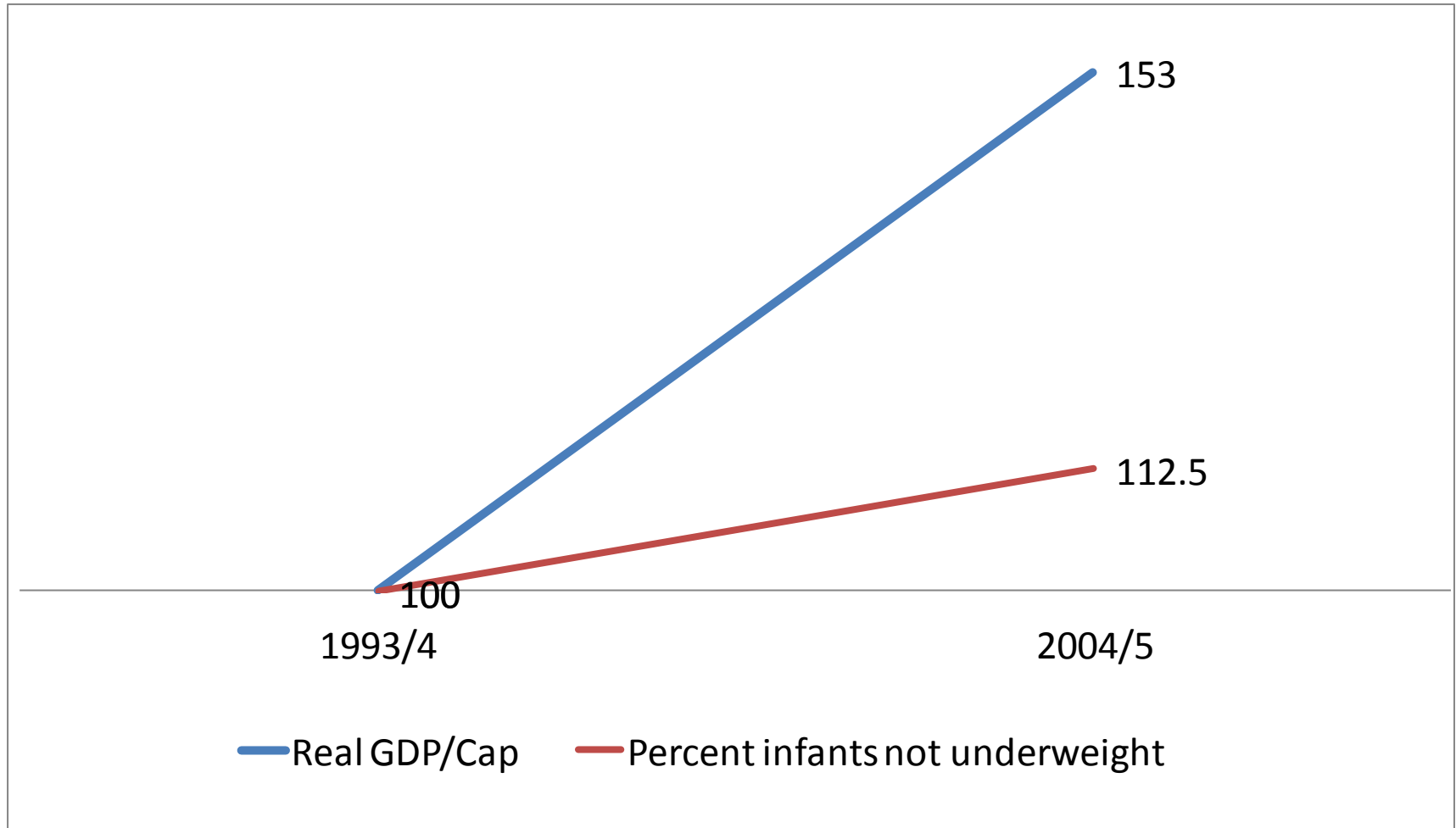
Paradox of economic growth and child growth

- Only China has grown faster than India over the past 15 years (IMF)
- At current rates of progress, India will meet its Millennium Development Goals on nutrition in 2043
 - China has already met them
 - Brazil likely to meet them by target date of 2015 (Victoria 2011)

Economic growth

- The ability of growth to reduce poverty has held firm in the past 15 years
 - Datt and Ravallion 2010 published in EPW and WBER
- But no connection between economic growth and child nutrition
 - Subramanyam et. al. 2011 using 3 waves of NFHS published in Public Library of Science - Medicine

Economic growth in India: not working for nutrition



Source: growth data, Table 1, Topalova 2008; nutrition data, NFHS

1. Do the international nutrition standards apply to India?

Table 1: India Compared to Chad and Central African Republic

Indicator	India	Chad	Central African Republic (CAR)	Chad as % of India	CAR as % of India
Life expectancy (2009)	65	48	48	74	74
Infant mortality per 1,000 live births (2009)	50	124	112	248	224
Under-five mortality per 1,000 live births	66	209	171	317	259
Maternal mortality per 1,00,000 live births (2009)	230	1,200	850	522	370
Per cent children below 5 stunted (2000-09)	47.9	44.8	44.6	94	93
Per cent children below 5 underweight (2000-09)	43.5	33.9	21.8	78	50

Source: WHO World Health Statistics, 2011.

Does India Really Suffer from Worse Child Malnutrition Than Sub-Saharan Africa?
Arvind Panagariya. May 4, 2013 vol xlviil no 98 18 EPW Economic & Political Weekly

Panagariya on international standards for height and weight for age

“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.”

Table 3: Height Differences across High-income Countries (cm)

Country	Male	Female	Age	Year
Netherlands	183.2	169.9	20-30	2010
Sweden	181.5	166.8	20-29	2008
Germany	181	168	18-25	2009
US	177.6	163.2	20-29	2003-06
United Kingdom	177.1	164.4	16-24	2010
Canada	176	163.3	25-44	2005
South Korea	173.7	161.1	17-18	2011
Portugal	173.7	163.7	21	2001
Japan	170.7	158	17	2011
Singapore	170.6	160	17-25	2003

Source: Excerpted from the table in http://en.wikipedia.org/wiki/Human_height (accessed 11 October 2012), which also gives the original sources of the data.

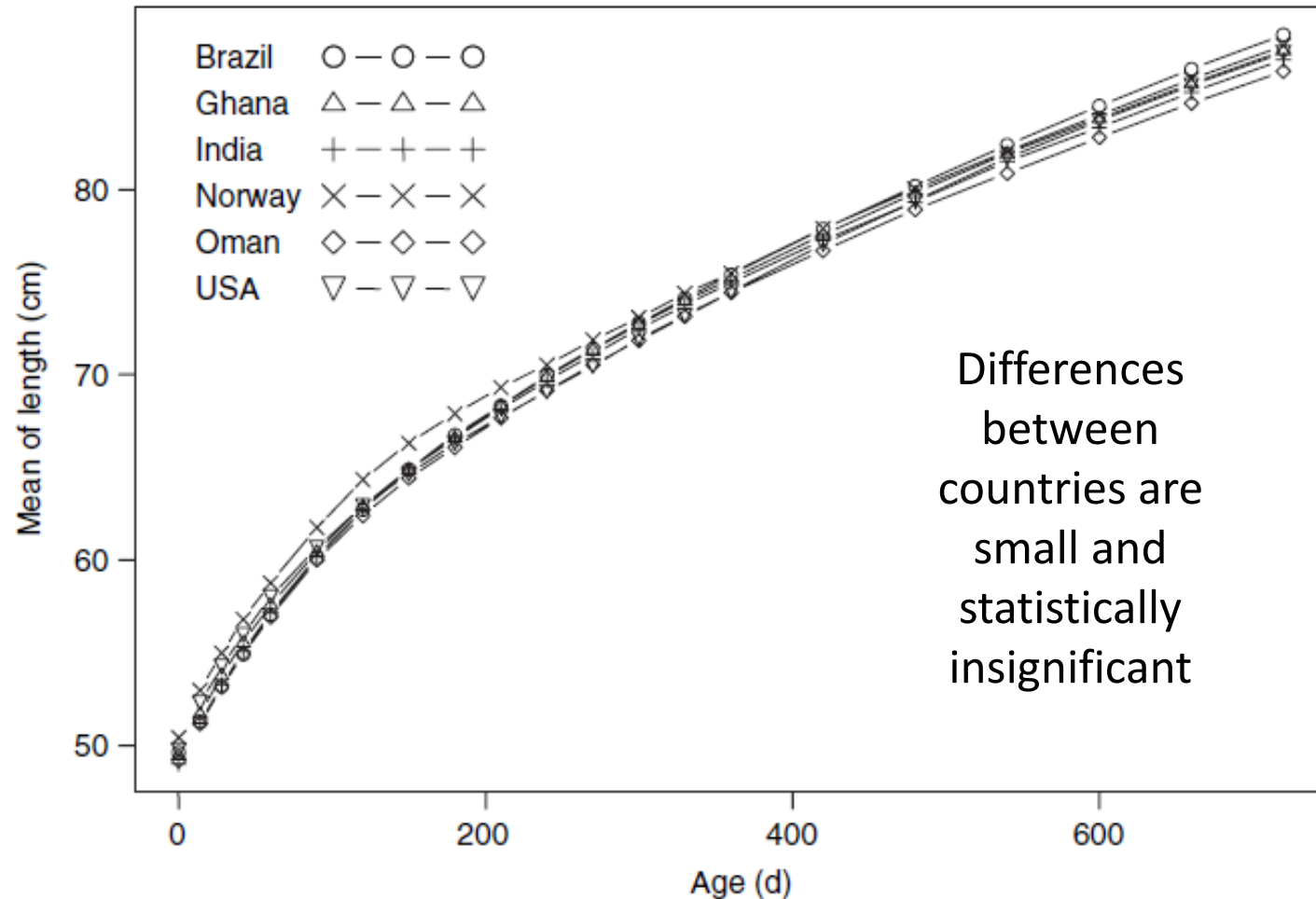
Panagariya's comparisons are not tight enough

Table 4: Height of Moroccan and Dutch Children in the Netherlands in 2010 (in cm)

Age in Years	Boys			Girls		
	Moroccan	Dutch	Difference	Moroccan	Dutch	Difference
1	76.1	76.7	0.6	75	75	0
2	87.7	88.4	0.7	86.5	87.1	0.6
3	96.8	97.8	1	96	97	1
4	104.5	105.5	1	103.5	104.9	1.4
5	111.4	113.2	1.8	110.2	112.9	2.7
21	177.8	183.8	6	162.8	170.7	7.9

Lawrence Haddad, IDS Sussex
Source: www.tno.nl

What does a tight comparison show? WHO Multicountry study of growth trajectories in comparable communities, children 0-2 years



Assessment of differences in linear growth among populations in the WHO Multicentre Growth Reference Study WHO MULTICENTRE GROWTH REFERENCE STUDY GROUP. *Acta Pædiatrica*, 2006; Suppl 450: 56!/65
Lawrence Haddad, IDS Sussex

Can these improvements happen in one generation?

A recent review of the human and animal evidence (Martorell and Zongrone 2012) concludes:

“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”

Such profound changes might be beyond public policy, but this has nothing to do with standards.

2. What about birth order?

	(1) WFH z-score	(2) HFA z-score
South Asia	-0.726*** [0.133]	0.092 [0.136]
2nd child	-0.064*** [0.025]	-0.096*** [0.021]
3rd+ child	-0.192*** [0.027]	-0.381*** [0.023]
South Asia*2nd child	-0.039 [0.032]	-0.155*** [0.028]
South Asia*3rd+ child	-0.106*** [0.035]	-0.338*** [0.032]
Observations	192,056	192,056

There is no difference in wasting and stunting between Africa and India on First-borns

The Puzzle of High Child Malnutrition in South Asia
Seema Jayachandran and Rohini Pande, July 2012

3. What about Gender of Child?

	(1) WFH z-score	(2) HFA z-score
South Asia	-0.774*** [0.017]	-0.088*** [0.017]
South Asia*Female	0.037* [0.021]	-0.199*** [0.020]
Female child	0.011 [0.015]	0.231*** [0.013]
Observations	192,056	192,056

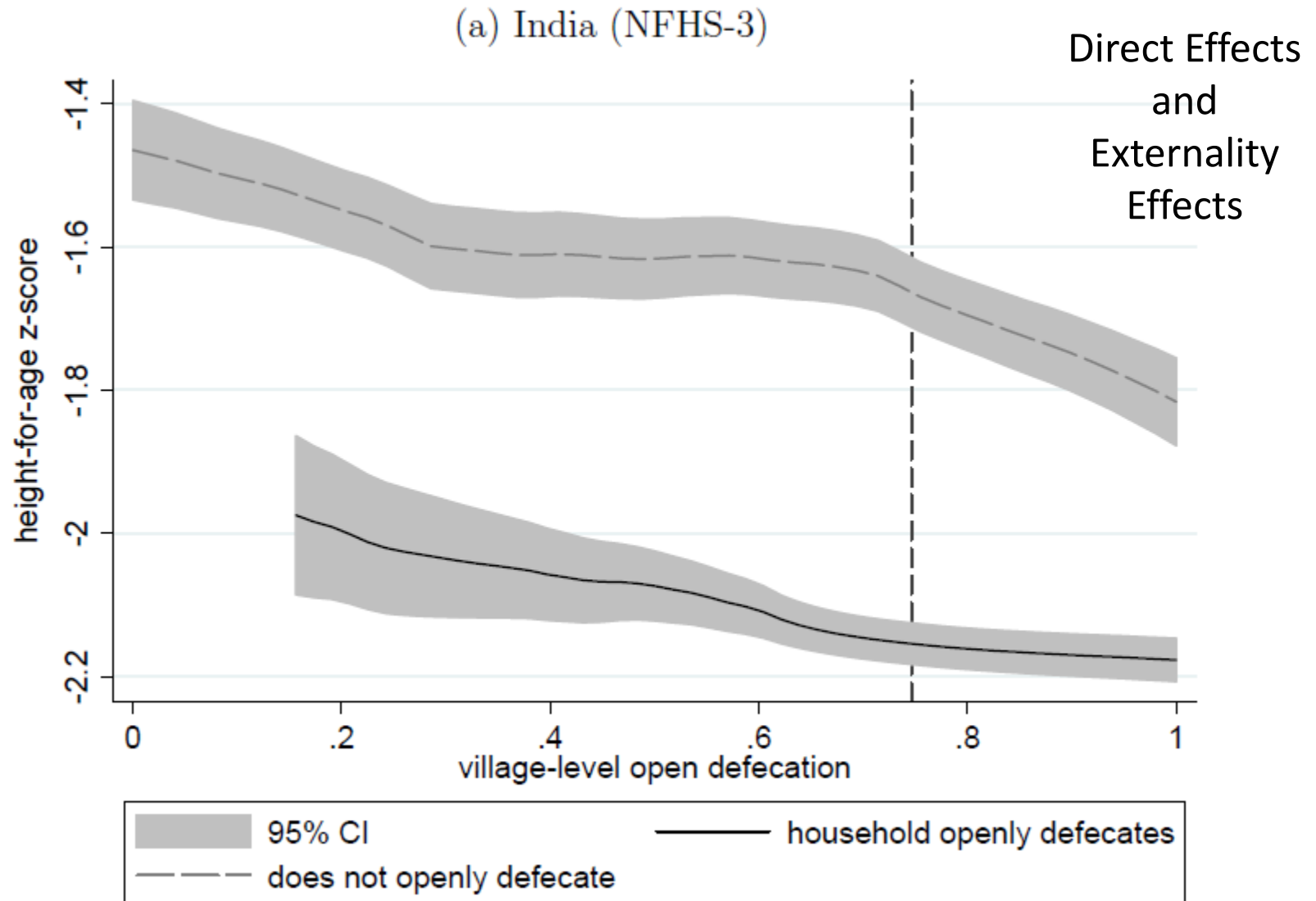
The Puzzle of High Child Malnutrition in South Asia
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Gender influences post-natal allocation of resources,
but pre-natal allocation of resources not correlated
to eventual sex outcome (not shown)

	(1) Mother's BMI	(2) Mother anemic	(3) Total vaccinations	(4) Breastfed \geq 18 months
South Asia	-0.024*** [0.000]	0.023*** [0.005]	0.378*** [0.025]	0.116*** [0.004]
South Asia*Female	0.000 [0.000]	0.014*** [0.005]	-0.171*** [0.028]	-0.032*** [0.005]
Female child	-0.000 [0.000]	0.001 [0.003]	-0.006 [0.017]	0.007*** [0.003]
Observations	125,823	81,563	178,852	181,301

The Puzzle of High Child Malnutrition in South Asia
Seema Jayachandran and Rohini Pande, July 2012

4. What about open defecation?



How much international variation in child height can sanitation explain? Dean Spears.

December 12, 2012

Lawrence Haddad, IDS Sussex

5. Disconnects between Indian agriculture and nutrition of infants?

$$ZHA=f(\text{AgGrowth} + \text{AgGrowth} * \text{Indian States} + z...)$$

“We also tested for parameter heterogeneity by interacting growth effects with regional dummies, but none of these interactions were significant at conventional levels, although a coefficient for an interaction between agricultural growth and a dummy for Indian states was only marginally insignificant. Moreover, the introduction of this interaction term rendered the agricultural growth coefficient significant and increased its magnitude.

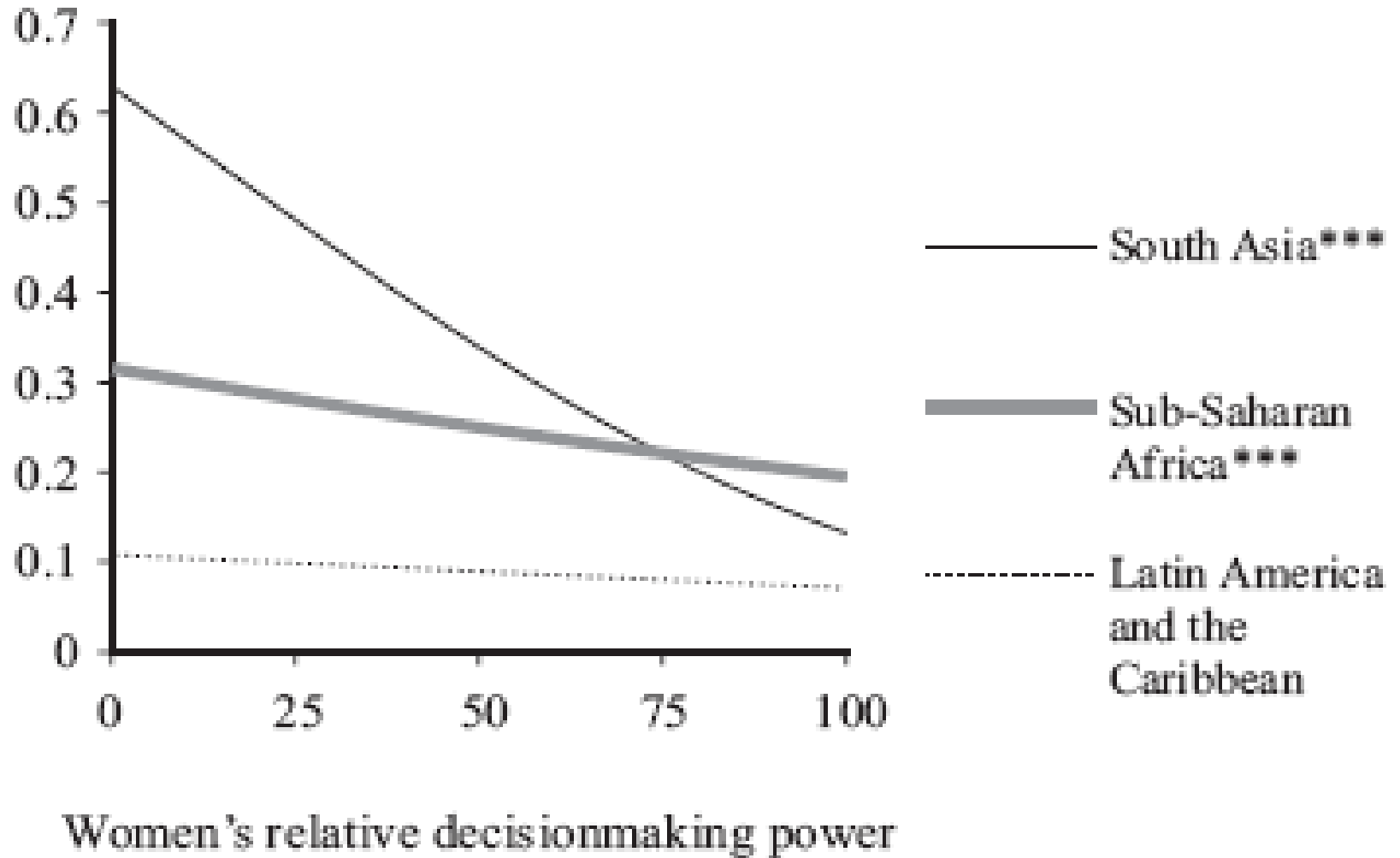
This could perhaps suggest that agricultural growth typically does reduce stunting prevalence, but has not done so in India.

Certainly some of the state level data for India are suggestive of that.”

Developmental Drivers of Nutritional Change: A Cross-Country Analysis. DEREK D. HEADEY. World Development Vol. 42, pp. 76–88, 2013

Proportion of under
5's who are
underweight

6. Women's status?



Recent study on Women's Autonomy

Arulampalan, Bhaskar, Srivastava June 2012

- Construct a latent variable of “Women's Autonomy”
 - Autonomy in economic, physical, decision making and emotional areas
- Use NFHS3 2005/6 data
- Stunting, Wasting are dependent variables
- Find:
 - Maternal autonomy reduces stunting and wasting only for children <3 years, but increases it for children over 3 years (thought to be lack of adequate child care as women work)

W. Arulampalam, Dept Econ, U. Warwick.

7. Declining calorie intake?

Deaton and Dreze (2009)

- changes in relative prices
- demographic patterns
- food habits
- calorie requirements

Smith (2013)

- Household Food Consumption Surveys collected by the National Statistical Office do not capture increasing shares of foods purchased outside the home!

8. Lack of complementary feeding options for infants?

Veena Rao (2012)

- 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
- “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”

9. Relatively Ineffective Nutrition Interventions?

- Coverage of essential nutrition interventions is low ~ 30-40% (P. Menon 2009, IDS Bulletin)
- ICDS: new evidence to show positive impacts, but could be much more efficient (E. Kandpal 2011, World Development)
- MMS: good impacts on nutrition (Singh 2008), but wrong age group (4-5 year olds) for early undernutrition
- ASHA: promising (R. Ved 2011) but no impact studies yet and recruitment and support systems need strengthening

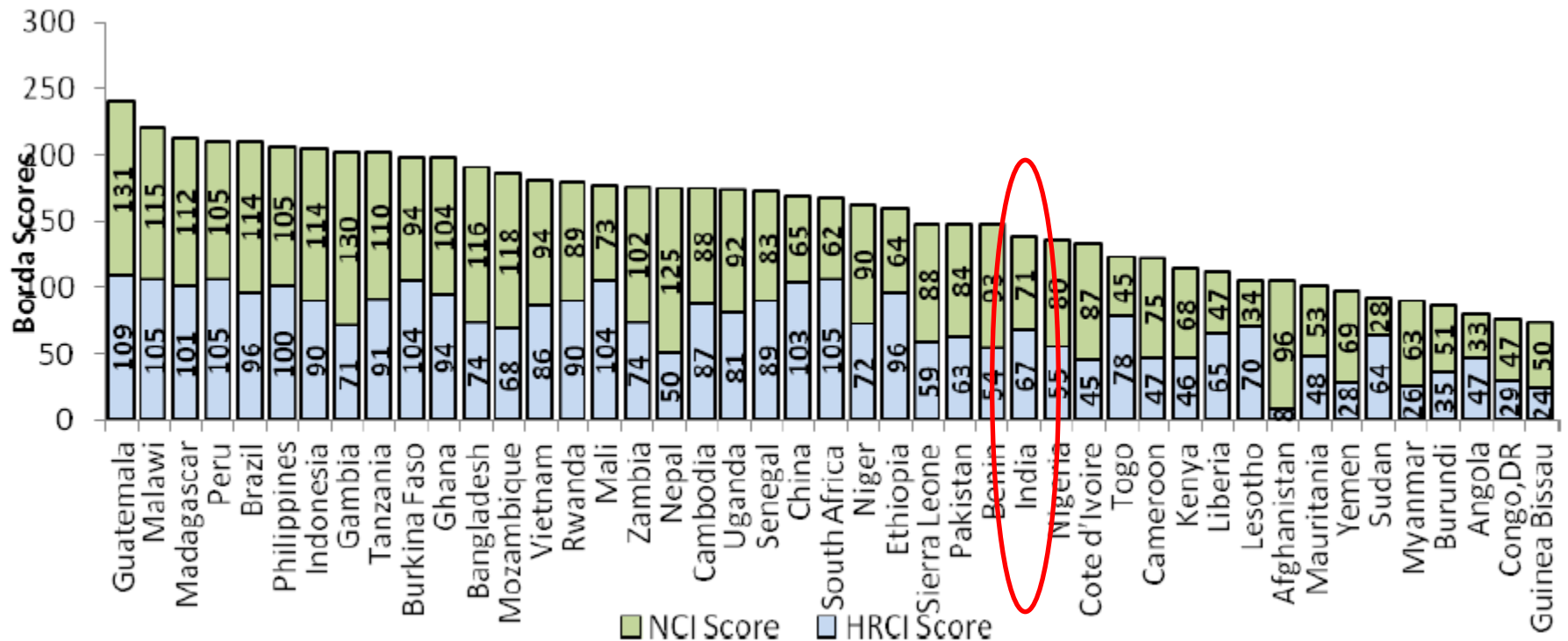
Source: Haddad, L. Why India Needs and National Nutrition Strategy 2011. British Medical Journal.

10. Weak Nutrition Governance?

- The biggest puzzle of the 10
- Government and civil society not well supported
 - Need slimmer & more frequent surveys to track nutrition outcomes
 - Need better diagnostic processes for prioritisation of action
 - Need a revamp of how nutrition is taught within higher education: focus on breadth and leadership
 - Need stronger accountability mechanisms: macro and micro
- Need a focal point at senior level within Federal Government

India scores low on the commitment to hunger reduction and to nutrition improvement

Figure 5 Country nutrition commitment and hunger reduction commitment scores



The Hunger And Nutrition Commitment Index (HANCI 2012): Measuring the Political Commitment to Reduce Hunger and Undernutrition in Developing Countries. April 2013. Dolf te Lintelo, Lawrence Haddad, Rajith Lakshman Karine Gatellier, Institute of Development Studies

Research gaps

- How to improve service delivery (coverage and quality)?
- How to improve accountability and reduce corruption?
 - Which institutions are important for horizontal and vertical coherence?
 - Which mechanisms work (macro and micro)?
 - Data (will real time data on nutrition outcomes make a difference?)
- Understand if/why is agriculture is seemingly disconnected
- With new NFHS data, try to compare relative impacts of girl preference, open defecation, women's status, governance variables (get away from single issue explanations)
- Maybe NFHS4 will unveil the riddle wrapped in an enigma and show strong declines in stunting as for Maharashtra!

Conclusions

- 10 enigmas and puzzles—some can be discounted, most not
- We don't know much about their relative importance in different contexts
- There are some for which we have less data and analysis related to nutrition (e.g. discrimination based on caste and class)
- Perfect storm of disabling factors (or is it?)
- Biggest puzzle is why the Gol isn't more concerned
- Must not let enigmas be distractions from action