Chapter 4

# Child Malnutrition in India and China: A Comparison

**Peter Svedberg**

In the early 1990s, India and China were home to more than half the preschool children in the developing world who were malnourished, as measured by stunting or underweight.[1] Since then, child malnutrition has declined in both countries but from different levels and at different paces. There are also notable differences in the concentration of child malnutrition along the state–province, rural–urban, and female–male divides. This chapter highlights the main differences in levels and trends for these dimensions of malnutrition and considers the most likely explanations for the observed differences. It is hoped that both countries can learn from each other's experiences and thereby design and implement more efficient policies for further alleviation of malnutrition.

## Levels and Trends in Child Malnutrition

In both India and China, three national surveys of child stunting and underweight have been carried out (in India, National Family Health Surveys were conducted in 1992–93, 1998–99, and 2005–06, while in China, National Surveys were undertaken in 1982, 1992, and 2002). The earliest survey year for which child malnutrition in India and China can be compared, after some adjustment of the data, is 1992 (see Box 4.1). At that time, the incidence of stunting among children aged 0–3 years was notably higher in India than in China (47 versus 32 percent), and underweight was three times more prevalent (52 versus 17 percent, respectively).

In India, the share of underweight children declined by a few percentage points between the two early surveys but remained virtually unchanged from 1998/99

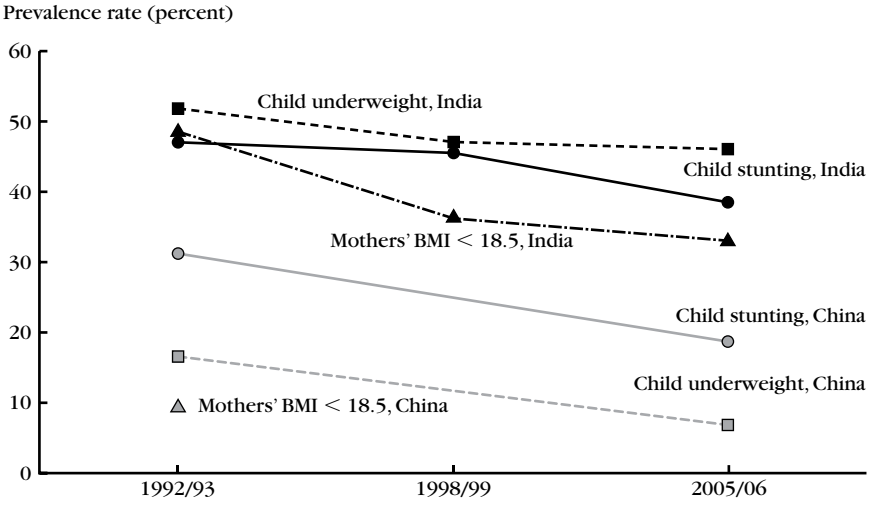
### Box 4.1 National surveys, data comparability, and statistical caveats

In both India and China, only three national surveys of child stunting and underweight have been carried out. For each country, numerous smaller surveys cover selected states and provinces or only rural or urban children. These surveys are not sufficiently representative to allow intercountry or intertemporal comparison. The results of the three National Family Health Surveys from India are, with a few minor adjustments in the first survey (1992/93), internally comparable. In China, national surveys were undertaken in 1982, 1992, and 2002. The first survey is not comparable with the two later surveys, however, because the children covered were not chosen at random (they were mainly the 20 percent of children attending kindergartens, where they enjoyed supplementary feeding and health care).

The direct comparability of the survey results from 1992 is compromised because the Indian survey covered 0- to 4-year-olds, while the Chinese survey covered 0- to 5-year-olds. To accomplish comparability between the two countries and also over time, all estimates of stunting and underweight were recalculated to include 0- to 3-year-olds only, the age group covered in the Indian surveys from 1998/99 and 2005/06. Another correctable incomparability is that the estimates available from the 2002 Chinese survey were derived based on recent (2006) revisions of what the World Health Organization defines as child stunting and underweight. These new norms produce somewhat higher rates of prevalence for stunting and lower rates for underweight than the earlier norms, so the data have been recalculated in accordance with the earlier standards.

In addition, the estimated gender differences reported for India are ambiguous. This may seem puzzling considering the strong preference for sons revealed by the boy/girl ratio of 1.11 at birth in 2001, mainly as a consequence of sex-selective abortions. However, if the less-desired female infants tend to die before or closely after birth, this may artificially reduce the incidence of stunted and underweight female children. In China, the one-child-only policy probably tends to leave some female children unregistered in rural areas, and the same applies to temporary migrants' children in urban areas. Neither of these possible biases has been accounted for in the respective national surveys.

**Figure 4.1 Child stunting and underweight and mothers with low body mass indexes in China and India, 1992/93–2005/06**




Source: Calculated by the author from national surveys.
Note: BMI, body mass index.

to 2005/06. Child stunting, in contrast, was almost flat between 1992/93 and 1998/99 but declined by 8 percentage points between 1998/99 and 2005/06. The different development for underweight and stunting has yet to be analyzed and explained (Figure 4.1).

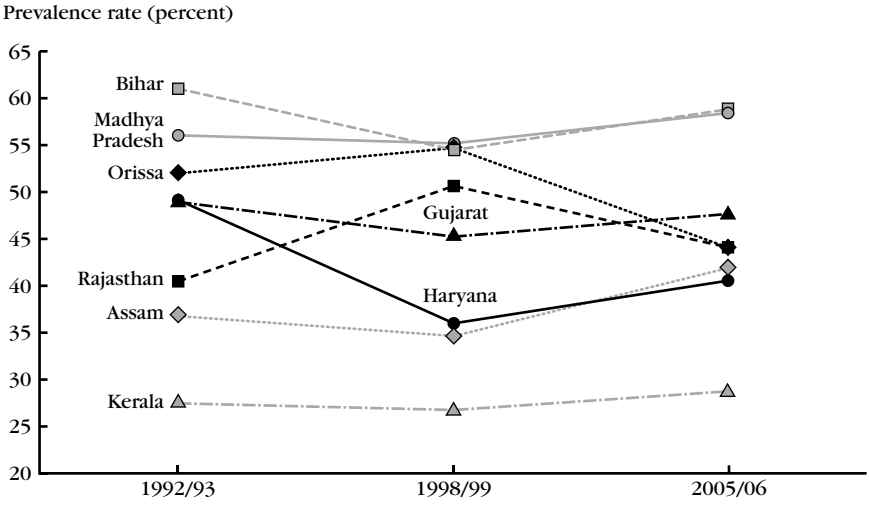
In China, the decline in child underweight and stunting between the 1992 and 2002 surveys was quite dramatic—a reduction of about half. This means that China reached its Millennium Development Goal (MDG) by 2002, more than a decade ahead of the target year 2015. If present trends prevail in India, it will miss its MDG by a substantial margin.

For India, nationally representative estimates of malnutrition in adult women (mothers) allow intertemporal comparison. The share of mothers with a body mass index (BMI) of less than 18.5 declined notably between the first two surveys but only by a minuscule 3.2 percentage points between 1998/99 and 2005/06, from 36.2 to 33.0 percent. For China, no estimate of mothers' BMI from the 2002 survey has yet been published. In the 1992 survey, 9.9 percent of adult women in China were underweight, about one-fifth the rate in India around that time.

## Intracountry Differences

The prevalence of child underweight has declined uninterruptedly in 7 of the 15 largest Indian states since 1992/93, while it increased in the other 8 states between

**Figure 4.2 Child underweight in eight large Indian states where it increased in a subperiod between 1992/93 and 2005/06**




Source: Calculated by the author from national surveys.

two of the survey years. In 6 of these states, the increase took place between the two most recent surveys (Figure 4.2). There are no comparable estimates of changes in child underweight (or stunting) by province in China.

In 2005/06, the prevalence of child stunting and underweight in India was about twice as high in some of the landlocked states in the north as in the coastal states in the south. A large but not nationally representative Chinese survey from 2000 shows that the prevalence of stunting and underweight was highest in the inland provinces in the west.

## Rural–Urban Differences

In India, the ratio of the prevalence of child stunting in rural and urban areas went up from 1.21 in 1992/93 to 1.36 in 1998/99 but declined marginally by 2005/06. The equivalent ratio for underweight increased uninterruptedly from 1992/93 to 2005/06, although the change was not drastic by any means.

In China, the concentration of child malnutrition in rural areas is much higher than in India. The 1992 National Survey shows that the rural–urban prevalence ratio was above 3.00 for both stunting and underweight. According to preliminary reporting from the 2002 survey by the World Health Organization (WHO) of the United Nations, the ratios have declined somewhat.

## Gender Disparities

Some subnational studies of gender differences in anthropometric status have found that female children in India are at a disadvantage, some have found no gender difference, and a few have found that male children are more frequently stunted or underweight. Although the evidence to date has been mixed, a strong perception lingers that young girls are nutritionally worse off than boys.

The three national Indian nutrition surveys also show mixed results. The first survey, from 1992/93, reports no significant gender difference in either stunting or underweight. The 1998/99 survey, based on the WHO norms for estimating stunting and underweight in children that were in place at that time, shows that female children were at a highly significant disadvantage in both measures. However, when the newly revised WHO norms are applied, no gender difference is found in the prevalence of stunting in 1998/99, while boys are found to have been at a significant disadvantage in terms of underweight. WHO raised the norms for stunting more for boys than for girls, which helps to explain this reversal, but other statistical problems also make interpretation difficult (see Box 4.1). The 2005/06 Indian survey results, based on the new WHO norms, reveal no significant difference in either stunting or underweight between boys and girls.

In China, the prevalence of stunting and underweight in 1992 was slightly higher for boys than for girls, but the difference is not statistically significant. In 2002, under the revised WHO norms, boys were at a statistically significant disadvantage in terms of stunting, while there was no difference in terms of underweight.

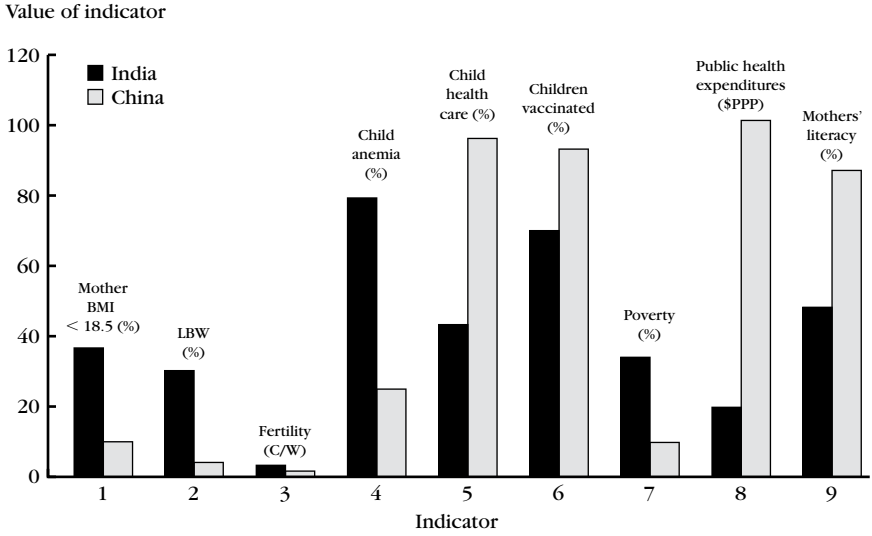
## Can the India–China Differences Be Explained?

The two most striking differences between India and China are the much higher prevalence of child stunting and underweight and the slower rates of decline in India. One way of exploring the causes is to compare factors that have been demonstrated to affect child malnutrition in the empirical literature at large.

In macrolevel studies based on cross-country or cross-state observations, per capita real income (poverty) and indicators of female (mothers') status usually correlate most highly. Most microlevel studies in the epidemiological tradition find that mothers' nutritional status, low birth weight (LBW), feeding practices, fertility, and access to professional health care are the main determinants of child malnutrition (Figure 4.3).

The first proximal determinant, mothers' own nutritional status as measured by the share of women with a BMI of less than 18.5, is widely acknowledged as the chief reason behind LBW (the second indicator). LBW, in turn, is the most powerful predictor of child malnutrition in infancy and early childhood. On these two indicators alone, India scores extremely poorly in comparison with China.

**Figure 4.3 Selected proximal and underlying determinants of child malnutrition in India and China, 2004 or closest year**




Source: Calculated by the author from national surveys and WHO (World Health Organization), *World health statistics 2007* (Geneva: WHO, 2008).

Note: BMI, body mass index; LBW, low birth weight; C/W, number of children per woman; PPP, purchasing power parity.

A high fertility rate implies that the average household has many children, which reduces the resources and time a mother has to care for each child. High fertility also goes hand in hand with shorter birth spacing and mothers' being very young at first birth, which further compromise their ability to provide good care. The fertility rate—number of children per woman—is almost twice as high in India (3) as it is in China (1.7).

Child-feeding practices, reflecting both long-standing traditions and economic constraints, also differ between India and China. Child anemia, a marker of micronutrient deficiencies in lactating mothers' breast milk and in the weaning food fed to infants and young children, is three times higher in India than in China. This may help explain why the prevalence of child stunting is so much higher in India than in China (see Figure 4.1).

Frequent illness among children is another well-documented cause of malnutrition. Children may often fall ill because they are not fully vaccinated or not provided with adequate health care. In China, almost all children receive professional health care and are fully vaccinated. In India, fewer than half receive qualified health care, and 30 percent are not vaccinated (see Figure 4.3).

There are also pronounced gaps between India and China when it comes to underlying causes of child malnutrition (indicators 7–9 in Figure 4.3). The prevalence of poverty, as estimated by the World Bank, is three times higher in India than in China. Poverty is the chief determinant of the proportion of households that can afford an adequate diet and health care. Private, out-of-pocket health expenditures account for the bulk of total expenditures on health care in both India (75 percent) and China (64 percent), but government health expenditures per capita are five times higher in China, according to WHO estimates. Finally, maternal literacy, which has been found to improve all the proximal determinants of child malnutrition presented in Figure 4.3, is almost twice as high in China as in India.

## Conclusions

All indicators consulted show India trailing China by far when it comes to factors conducive to alleviating child malnutrition. It is hence not surprising that the prevalence of child malnutrition is much higher in India than in China and that progress has been slower in India. This is not to say, however, that the most important variable explaining the difference has been identified. That question will require further detailed research to resolve.

The fact that the prevalence of underweight and stunting in China has declined rapidly since the early 1990s does not mean that child malnutrition is on the way to being eliminated there. One-fifth of children in rural areas are still stunted, indicating that diets are of low quality and micronutrient deficient and that health care is inadequate. That underweight is now almost absent in China suggests that calorie insufficiency is no longer a problem there. The problem is rather the opposite: an increased prevalence of child overweight, another manifestation of malnutrition. According to the new WHO norms, 12.5 percent of all children in China are overweight or obese (above two standard deviations from the median norms); about 40 percent of children have a weight for their age above the "normal" (above one standard deviation). Child malnutrition is therefore still a concern in China, although with different connotations than in the past.

## Note

1. The traditional Waterlow three-tiered classification of anthropometric failure has been the main instrument used for assessing children's malnutrition based on stunting (short height for age), underweight (low weight for age), and wasting (low weight for height). Many children have double or triple anthropometric handicaps; they are (a) stunted and underweight, (b) wasted and underweight, or (c) stunted, underweight, and wasted. This chapter will focus on the first of these groups.

## For Further Reading

Jha, P., R. Kumar, P. Vasa, N. Dhingra, D. Thiruchelvam, and R. Moineddin. Low male-to-female sex ratio of children born in India: National survey of 1.1 million households. *Lancet* 367, no. 9506 (2006): 211–18.

Svedberg, P. Declining child malnutrition: A reassessment. *International Journal of Epidemiology* 35, no. 5 (2006): 1336–46.

———. Why malnutrition in shining India persists. Institute for International Economic Studies, Stockholm University. Manuscript under review.

United Nations Administrative Committee on Coordination / Sub-Committee on Nutrition. *Low birth weight.* Nutrition Policy Paper 18. Geneva: World Health Organization, 2000.

World Health Organization. Global database on child growth and malnutrition. <http://www.who.int/nutgrowthdb/en/>.