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Multi-Dimensional Deprivation in the Awakening Giants: A Comparative Study on Micro Data[a]

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Abstract

This paper evaluates and compares multidimensional deprivation in India and China during the 1990s and beyond. The exercise is conducted on two micro data sets that have been tailor made for this study. It departs from the recent comparisons between India and China that are based on macro aggregates such as trade, investment and growth rates and undertakes a systematic and comprehensive analysis of living standards in the two countries based on unit record data. The paper disaggregates the overall deprivation by categories, and compares the deprivation distribution between the two countries. This study reports that the high growth rates did not translate into an unambiguous improvement in living standards in either country. Deprivation is still unacceptably high in some categories. While rural deprivation is much higher in India than in China, they face similar levels of urban deprivation. Special attention is paid to a comparison of child health, and its link with mother's health, between the two countries. China outperforms India on child health with lower incidence of stunting and wasting. While both countries still record high rates of child stunting in the new millennium, wasting is much more of an issue in India than in China. The study provides evidence of strong link between deprivation in access to basic facilities, such as drinking water and clean fuel for cooking, and child undernourishment. The Indian evidence suggests that children of undernourished mothers are at high risk from stunting and wasting, but this does not extend to China. Notwithstanding evidence of decline in mother's BMI over this period, China outperforms India on women's health as well.

Key Words: Multi-Dimensional Deprivation, Stunting, BMI, Anaemic Rates, Decomposability
JEL Classification: I10, I31, I32, O1

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Multi Dimensional Deprivation in the Awakening Giants: A Comparative Study on Micro Data

1. Introduction.

There is now much interest in a comparison of the recent economic performances of India and China. The present study contributes to this emerging literature. India and China are among the fastest growing nations in the world. They came into existence as free or independent entities around the same time. While the People's Republic of China was established in October, 1949, India declared herself a federal Republic only three months later with the coming into force of the Indian Constitution in January, 1950. With over a billion people in each country, India and China together contain nearly two fifths of the world population. They parallel one another in size and diversity. Both these countries undertook a process of economic reforms, with China introducing them in 1979 and India, somewhat later, in the mid 1980s, though more seriously in 1992.With abject poverty and other forms of deprivation in both countries at the time of their freedom or independence, these countries had different trajectories on their road to economic development to date. As both buyers and sellers, these countries offer huge markets to the rest of the world. As reported in Winter and Yusuf (2007, Table 1.1), India and China together accounted for 6.4 % of the world's GDP in 2004, and their joint contribution to world growth during the decade 1995-2004 was 16 %. China has just become the second largest economy, behind the US. India is not far behind and is expected to catch up with Japan (on PPP based calculations) in the near future. As the recent global financial crisis deepened, spread and, then eased, the rest of the world looked to India and China for a demand driven path out of this crisis. It is therefore natural for there to be much interest in comparing the economic performances of India and China. These countries have been referred to as "awakening giants" by Bardhan (2010) and "partially awakening giants" by Chaudhuri and Ravallion (2007).

Dreze and Sen (1995,Ch. 4) compare the economic performance of these two giant economies in the 1980s and early 1990s on infant mortality, literacy, population and

economic growth rates and, also, contain a survey of some of the earlier studies that make similar comparisons. The subject received a boost recently with the economic reforms in India in 1992 that was followed by a sharp rise in her growth rates putting her on par with China as a high growth achiever. Bardhan (2010), besides containing an updated comparative assessment of the economic rise of India and China, includes a survey of several other recent studies that compare these two economies. Examples of such recent studies include Borooah, Gustafsson and Shi (2006), Srinivasan (2006),Chaudhuri and Ravallion (2007), Bardhan (2008), Yip and Mahal (2008), Chen and Ravallion (2008), Basu (2009), Bosworth and Collins (2009)[1].

While the studies by Bardhan (2008) and Yip and Mahal (2008) compare the health services in the two countries, the overwhelming focus of the comparisons has been on macro indicators such as growth rates. Even where the focus has been on a comparison of poverty and inequality in the two countries, the studies have been conducted on aggregate data as the discussion in Bardhan (2010, Ch. 7) makes clear[2]. Even setting aside the issue of aggregation bias that affects such welfare comparisons, much of this literature has been uni dimensional in restricting itself to money metric measures of poverty and inequality. While these two economies have powered ahead, there has not been much attempt at comparing the pictures on deprivation in India and China. In particular, the recent move to the use of multi dimensional deprivation measures, encouraged by the work of Sen (1985) and evident in the publication of the Human Development Indicator (HDI), has not yet found its way in to the India/China comparisons.

To our knowledge, there has not been any previous comparison of multi-dimensional deprivation between India and China based on a wide range of deprivation dimensions using unit records from family expenditure or health surveys in the two countries. Such a comparison is one of the chief motivations of this study. The main reason for this gap in the literature has been the absence of a methodology for measuring and assessing multi-dimensional deprivation along with the lack of comparable micro data sets that allows such a comparative assessment. Both these handicaps have now been eliminated. There is now a

[1] See, also, the papers in the volume edited by Winter and Yusuf (2007).

[2] An exception is the comparative study on poverty and inequality in the two countries by Borooah, Gustafsson and Shi (2006) that was conducted on micro data sets from rural India and rural China.

well developed literature on the measurement of multi-dimensional deprivation and, almost simultaneously, we have comparable family health surveys in India and China containing unit records of individual and household level information on a wide range of deprivation dimensions over a near identical period in both countries. This paper exploits these parallel and rich micro data sets over proximate time periods to quantify and compare deprivation in these two large economies.

The deprivation dimensions, that are considered here, include a wide range of expenditure, health and non health dimensions, many of which have not been considered before in the context of either country. In doing so, the study deviates from the main thrust of the previous literature on India/China comparisons which seems to assume that high growth rates are automatically translated into sharp improvement in living standards. In these comparisons, we pay special attention to health deprivation in both countries, since the importance of health in the context of development is now well accepted [Daspupta (1993, Ch. 4), Strauss and Thomas (1998)].In doing so, we provide evidence, where there is currently none, on the contribution of health deprivation to total deprivation and compare the relative importance of the various deprivation dimensions in the context of overall deprivation in the two countries. Within the health dimension, we pay special attention to the health of infant children aged 0-3 years, since the health of such young children will be a significant determinant of the future prosperity of the two countries. A significant feature of the health aspect is a comparison of the magnitude and determinants of the long and short run health status of very young children in the two countries. This is designed to identify key policy variables that will help in achieving superior health outcomes. The improvement in health outcomes, while an important objective in itself, will also be instrumental in achieving in the future improved productivity, prosperity and a happier society. In keeping with the multi-dimensional focus of this study, this paper provides strong evidence on the link between deprivation in child health and that in other dimensions, most notably, the health of the child's mother. As the importance of child health in the context of development has grown, there is now a rapidly expanding literature on the subject based on the anthropometric statistics of children. Recent examples include McGillivray, Dutta and Markova (2009), Heltberg (2009) and Osberg, Shao and Xu (2009). The present study fits in well with this literature.

While the focus of this study is on the India/China comparison, the results are also of interest for each country studied on its own. The period considered, 1993-2006, is of special interest

in each case. It covers what is referred to as first and second generation reforms in India. On the brink of a serious balance of payment crisis in 1992, India undertook a series of economic reforms that transformed her from a slow growing economy into one of the fastest growing countries in the world. This was also the period when China set the pace for the rest of the world, not just the developing economies, in its growth dynamics and trade expansion as it became the second largest economy in the world. The empirical discussion combines the India/China comparison with an examination of how some of the key living standard indicators have moved in each country over this recent and relatively short time period of a decade and half. This study combines inter province and rural/urban comparison of multi-dimensional deprivation in each country with the macro level comparison of deprivation between India and China.

The plan of the rest of the paper is as follows. Section 2 describes the multi-dimensional measures that we have used in this study and states their principal properties. The data sets are described in Section 3. The results are presented and analysed in Section 4. This section is divided into three parts. Section 4.1 compares the two countries using the conventional standard of living indicators, namely, per capita expenditure, inequality and poverty rates. While the results on multi-dimensional deprivation are presented and analysed in Section 4.2, the focus shifts to child health and its determinants in Section 4.3.Section 5 concludes the paper.

2. The Multi-Dimensional Deprivation Measures and their Properties.

The literature now contains several excellent expositions[3] of the axiomatic approach to multi-dimensional deprivation and of the measures themselves. To make this paper self contained, this section briefly describes the multi-dimensional deprivation measures used in this study and discusses some of their more useful properties for the purposes of this study.

There are, principally, two alternative approaches to multidimensional deprivation measurement. Each of these involves measuring deprivation for a well defined category (e.g. access to electricity, access to clean fuel for cooking, etc.) and then aggregating these

[3] One such exposition, that we have relied on and borrowed from, is that in Jayaraj and Subramanian (2010, pgs. 54-58).

category specific deprivation magnitudes into a single number that measures the overall deprivation faced by a country or a region. They differ with respect to the emphasis placed when disaggregating the overall deprivation and working out the percentage contribution of each of the aggregated units. The first [see, for example, Klasen (2000), Bourguignon and Chakravarty (2003), Chakravarty and Majumder (2005)] follows the spirit of the HDI, HPI in defining deprivation as a linear function of the category specific deprivation magnitudes. It considers the weights of the category specific components in the measure of overall deprivation as either fixed exogenously (as with HDI) or determines them from data by principal components [Klasen (2000)] or estimates them as deprivation shares of the deprivation dimensions/categories[4] in overall deprivation and calculated as percentages using additively decomposable deprivation measures [Bourguignon and Chakravarty (2003), Chakravarty and Majumder (2005)]. The second approach [Chakravarty and D'Ambrosio (2006), Alkire and Foster (2009), Jayaraj and Subramanian (2010)] calculates the proportion of individuals that are deprived in 1,2,3,... dimensions and expresses the deprivation in the region as a function of the deprivation rates over the varying number of dimensions. The nation's deprivation measure is then expressed as a population share weighted average of the regional deprivation rates. Jayaraj and Subramanian (2010) modify the approach of Chakravarty and D'Ambrosio (2006) to make it more suitable for the household level data that is considered in the present study.

This study is a hybrid of both approaches. It uses the first to quantify the magnitude of deprivation, disaggregated by deprivation dimensions and by the regions[5], and then aggregates it to that of the country as a whole. The first approach allows us to present evidence on the relative importance of a deprivation dimension as a contributor to total deprivation in the country and compare them between the two countries. The study, then, uses the second approach to calculate directly the multi-dimensional deprivation in each country, disaggregated between its rural and urban areas. A key feature of the latter exercise is the presentation of evidence that isolates the plight of the severely deprived households (i.e. those deprived in many dimensions) from the others that include those who are deprived in only a few dimensions.

[4] These terms are used synonymously following their simultaneous use in the literature.

[5] These are the individual states in case of India and the provinces in case of China.

Let there be K (≥1) dimensions of deprivation. Let x_k^j $(k = 1\ldots, K;\ j = 1, \ldots J)$ denote the percentage of households in region j that are deprived in dimension k. Let x_k denote the corresponding deprivation rate for dimension k in the country as a whole.

The deprivation faced by region j is given by[6]:

$$I_\alpha^j = \left(\frac{1}{K}\right) \sum\nolimits_k (x_k^j)^\alpha \quad , \ \alpha \geq 1 \qquad (1)$$

α can be interpreted as "deprivation aversion" parameter that is fixed a priori by the evaluator[7]. A special case of the deprivation measure given by (1) is the HDI where K=3, α=1.

If we now pool all the states and consider the region/country as a whole, then the measure of deprivation is given by:

$$I_\alpha = \left(\frac{1}{K}\right) \sum\nolimits_k (x_k)^\alpha \quad , \quad \alpha \geq 1 \qquad (2)$$

The 7 key properties that are satisfied by I_α are:

1. If there is no deprivation in any dimension, then the overall measure I_α^j must be 0.
2. I_α^j lies between the minimal and maximal values of $(x_k^j)^\alpha$ across the K dimensions of deprivation.
3. Ceteris paribus, an increase in the deprivation in a single dimension must increase the overall measure of deprivation.
4. An equi proportionate increase in the deprivation in all dimensions will increase the overall measure by the same proportion.
5. Ceteris paribus, the increase in overall deprivation due to a given increase in a single dimension is larger the higher the deprivation in that dimension. This property is satisfied if $\alpha > 1$.

[6] This is the decomposable poverty measure suggested by Foster, Greer and Thorbecke (1984).

[7] In the calculations of the deprivation rates reported below, α has been fixed at 1. However, we also present evidence on how the relative importance of the various deprivation dimensions varies with α.

6. This index is additively decomposable both between states and between dimensions.
7. Given the unchanged population size for the country as a whole, migration of residents from a less deprived state to a more deprived state will increase the deprivation of the country as a whole.

A key property of the deprivation measure, eq. (2), is the decomposability property that allows us to calculate the percentage contribution of dimension k to total deprivation in the country. A comparison between India and China of the deprivation shares of the various deprivation dimensions and, in particular, of the relative importance of health and non health deprivation is a special feature of this study. As reported later, the calculated percentage contributions are quite sensitive to the a priori value of the deprivation aversion parameter, α.

Let us now briefly explain the second approach adopted in this study.

In independent contributions, Chakravarty and D'Ambrosio (2006), Jayaraj and Subramanian (2010) propose a set of measures of multidimensional deprivation that are formally equivalent. Instead of starting from the dimension specific head count deprivation rates, this approach takes a slightly different route by starting from the proportion of households who are deprived in 1,2,3, etc. dimensions, and then aggregating these into regional deprivation rates and from that to the nation as a whole. A key point of departure from the previous approach is that, unlike before, the precise identity of the deprivation dimension does not matter here, only the number of deprivation dimension failures matters.

Following the notation used by Jayaraj and Subramanian (2010), let n_j denote the number of households that are deprived in exactly j dimensions, $j \in \{0,1,\dots,K\}$. Let the total number of households be denoted by n. Then, three possible headcount rates of deprivation are as follows.

$$H^I = \frac{n_K}{n} \tag{3}$$

$$H^U = \frac{(n_1+n_2+\cdots\dots\dots..+n_K)}{n} = \sum_{j=1}^{K} H_j\,, \qquad where\ H_j = \frac{n_j}{n}, j \in \{1,\dots,K\} \tag{4}$$

$$H_{j^*} = \frac{(n_{j^*} + \cdots \ldots + n_K)}{n} = \sum_{j=j^*}^{K} H_j \qquad (5)$$

H^I, H^U and H_{j^*} are headcount rates of multi-dimensional deprivation. While H^I denotes the headcount deprivation rates of households who are derived in all the K dimensions, and is referred to as the "intersection method', H^Udenotes the corresponding headcount rates of households that are deprived in at least 1 dimension and is referred as the "union method". It is clear that while H^Iunderstates the magnitude of deprivation, H^Uoverstates it. Alternatively, H^Imeasures the magnitude of extreme deprivation, while H^U measures the aggregate of mild, moderate and extreme deprivation. A compromise is H_{j^*}, which lies between H^I and H^U , where j^* is specified a priori. It approaches the former when j^* moves towards K, and approaches the latter when j^* moves towards 1.

A more sophisticated measure than H_{j^*}, on the lines of Atkinson (1970)'s inequality measure and Foster, Greer and Thorbecke (1984)'s poverty measure, has been suggested by Jayaraj and Subramanian (2010) and is as follows:

$$\pi_\alpha = \sum_{j=1}^{K} (j/K)^\alpha \; H_j \qquad (6)$$

The parameter,α, performs a role analogous to that of the α in case of the Atkinson (1970) and Foster, Greer and Thorbecke (1984) measures. As α increases from 1 to higher values, π_α gives greater weight to the deprivation rates of households that are deprived in more and more dimensions, i.e., the more deprived households and, at very high α values, it measures the magnitude of extreme deprivation. This is similar to the interpretation of α as an "inequality aversion" parameter in the Atkinson (1970) inequality measure.

Similar to the axiomatic properties described for the deprivation measure,I_α, given by eq. (1), the following principal properties are satisfied by π_α , given by eq. (6).

1. Anonymity: The identity of the individuals should not affect the deprivation measure.
2. Ceteris paribus, if the range of deprivation, i.e., the number of deprivation dimensions increases, then the measure will register an increase.

3. Ceteris paribus, if a household 'i' suffers deprivation in one more dimension but household 'j' experiences deprivation in 1 less dimension, and household 'i' is deprived in more dimensions than household 'j', then the measure will register an increase in deprivation. This property will hold if $\alpha > 1$ and is analogous to the Pigou-Dalton transfer principle in the context of income transfer.
4. The deprivation measure is additively decomposable in the population subgroups, i.e., can be written as a population share weighted average of the subgroup deprivation measures. This property is satisfied if $\alpha \geq 0$, and is particularly convenient in the context of the present study.

3. Data Sets.

The Indian data set came from National Family Health Surveys (NFHS).The NFHS[8] is a large scale, multi-round survey conducted on a representative sample of households throughout India. So far, three rounds of NFHS, namely, NFHS1-3 have been completed and this study is based on all three of them. The NFHS-1, which was conducted in 1992-93, collected extensive information on population, health, and nutrition, with an emphasis on women and young children. NFHS-2 was conducted in 1998-99 in all 26 states of India with added features on the quality of health and family planning services, reproductive health, anaemia, the nutrition of women, and status of women. NFHS-3 was carried out in 2005-06 with added information on the anaemic status of the children. Since the information on anaemic status of children was not available in the earlier rounds of the NFHS for India, nor was it available in any of the rounds of the Chinese data set, we did not use this information in the calculation of multi-dimensional deprivation. However, the child's anaemic status was included as a determinant in the child health regressions for India. Information on the following deprivation dimensions[9] are available in all the NFHS rounds: Access to drinking water, electricity, clean fuel for cooking, toilet facility, bicycle, radio, education of the household head, whether the household belongs to the poorest wealth quintile, and the child's long and short term health status (i.e. "stunted" or not, "wasted" or not). The child health variables took the form of "height for age" and "weight for height" that were converted into z

[8] See the NFHS webite, www.nfhsindia.org for further details.

[9] To ensure comparability between the two countries, the chosen non health dimensions from the NFHS data sets in India are identical to the ones available in the China Health and Nutrition Survey (CHNS).

scores. NFHS-2 contains additional information on the mother's BMI status, while NFHS-3 contains information on the child's anaemic status. A household is considered educationally deprived if the household head did not receive primary education. The NFHS has the complication in that while the information on the non health deprivation dimensions is at the household level, the health information is available at the individual level. To translate the individual level information to the household level, we adopted the following definition of household level health deprivation: A household is considered deprived on account of the long and short run health of its children if 60% or more of its children (0-3 years) are "stunted" and "wasted'[10], respectively. These definitions of household deprivation on account of stunted and wasted children were also adopted for the application to the Chinese data set that is described below. If the mother's BMI was less than 18.5 or over 30, the household was considered deprived on account of the mother's health. NFHS-3 also contained information on variables that measure women's autonomy. These, along with the deprivation dimensions, were included as determinants of child health in the estimated regressions. Before doing these regressions, the child health variables had to be linked to the household variables of the household that the child belonged to. The child health regressions also used state level indicators, namely, per capita income and the literacy rates of the household's state of residence that were obtained from the national accounts statistics. To ensure comparability between the three NFHS data sets, we settled on a common group of 15 states ignoring the smaller states[11] that came into existence towards the end of the chosen period. These states are : Andhra Pradesh, Assam, Bihar, Gujarat, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

The Chinese data set came from the China Health and Nutrition Survey (CHNS). This is an ongoing international project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention[12]. This project was designed to examine

[10] A child (0-3 years) is considered "stunted" or "wasted" if that child's z score of height for age and of weight for height is, respectively, less than -2. This is consistent with the definition of child malnourishment adopted in the literature [see, for example, Svedberg (1990), Glewwe, Koch and Nguyen (2004)].

[11] These states were assumed to be part of the original states that they were created from.

[12] This description is taken from the website: www.cpc.une.edu which contains further details.

the effects of the health, nutrition, and family planning policies and programs implemented by the national and local governments and to see how the social and economic transformation of Chinese society is affecting the health and nutritional status of its population. The Chinese Nutrition and Health Surveys in 2002 were approved jointly by the Ministry of Health, the Ministry of Science and Technology and the Statistic Bureau of China. Keeping in mind the need to consider the CHNS data sets covering proximate periods to the NFHS data sets, this study considered the CHNS1993, CHNS2000 and CHNS2006 data sets. These surveys are contemporaneous to the NFHS-1, NFHS-2 and NFHS-3, respectively. The Chinese surveys took place over a 3-day period using a multi stage, random cluster process to draw a sample of over 4000 households in nine provinces[13] that vary substantially in geography, economic development, public resources and health indicators. The CHNS data sets have been used in several recent studies on China. Examples include the study on child health by Osberg, Shao and Xu (2009), and studies on income inequality by Goh, Luo and Zhu (2009), and by Benjamin, Brandt, Giles and Wang (2010).The NFHS data sets had much larger sample sizes than the Chinese data sets, and this needs to be borne in mind as we evaluate and compare the magnitudes and precision of the child health parameter estimates from the two countries.

4. Results.

4.1 Comparisons of Real Expenditure, Inequality and Poverty Rates between India and China

The mean monthly per capita expenditure levels from the two data sets, calculated at constant prices in the two countries and in US dollars, disaggregated by rural and urban areas, are presented in Table 1. The reported mean values were calculated using both official exchange rates and PPP rates. While the official exchange rates for converting the local currencies into US dollars were sourced from Federal Reserve Bank of New York data base, the PPP rates were obtained from the World Economic Outlook database (October,2009). These rates have been reported in the Appendix (Table A1).The official exchange rates lead to a considerable understatement of the real expenditure figures in both countries in relation to the PPP rates, though much more in India than in China. This is evident from the much larger divergence between the PPP and exchange rates of the Indian Rupee than the Chinese Yuan, reported in

[13] The CHNS1993 had 8 provinces omitting the province of Heilongiiang that appeared in the later data sets.

Appendix Table A1. After recording a drop in mean per capita expenditure during the first half, 1993-2000, rural China experienced a sharp rise in the second half, 2000-2006, on both official exchange and PPP rates. In contrast, urban China recorded a sharp increase in the first half that continued in the second half on official exchange rates, but was unchanged on PPP rates. In contrast, while the real expenditure was fairly static in rural India, there was a large drop in urban India, especially on PPP rates. As shown in Mishra and Ray (2011), this picture for urban India is also true in the local currency. A comparison of the urban real expenditure figures between India and China shows that while India started this period in 1993 with a large lead over China on both exchange and PPP rates, the gap had narrowed considerably by 2005/2006 due to a significant increase in the mean real expenditure in China and a steady decline in India.

Place Table 1

The Gini measure of real expenditure and real income inequality in China and that of real expenditure inequality in India, calculated from the monthly per capita expenditure figures at constant prices are presented in Table 2. While the CHNS data provides income and consumption figures for China at household level, the NFHS data provides neither for India. We therefore calculated the expenditure inequality estimates for India from the monthly per capita expenditure figures (mpce) that are provided in the proximate rounds of the National Sample Surveys (NSS). These surveys do not provide income figures that would have enabled us to calculate comparable income inequality estimates. Table 2 shows that expenditure inequality in both sectors in China exceeded their corresponding Indian inequality estimates by a large margin. There has been an increase in rural expenditure inequality over this period in both countries. However, while rural China experienced a continuous and large increase during both the sub periods, rural India experienced an initial decline that was overcompensated by a sharp increase during the second half. In case of urban areas, while China experienced a continuous decline, India experienced once again an initial decline that was followed by a sharp increase in the second half of our chosen period. Note that the period, 1999/2000-2004/2005 is associated with a large increase in expenditure inequality in India. Lack of data prevents us from examining the robustness of the Indian evidence on expenditure inequality to the use of income inequality estimates, but the Chinese evidence shows that they do not always move in the same direction. Table 2 also shows that expenditure inequality in China exceeds income inequality especially in the urban areas. This

could be partly due to non response and understatement of income by the rich that is causing a downward bias in income inequality. This is clearly an area for further research.

The comparative picture on expenditure inequality in the two countries, and between rural and urban expenditure inequality, is seen in Figure 1 which presents the Lorenz curves based on NFHS3 and CHNS2006. While the top graphs compare the expenditure inequality between India and China in the two areas, the bottom graphs compare rural and urban expenditure inequality in India and China. While India outperforms China with sharply lower inequality in both areas, with the gap narrowing somewhat in the urban areas, the rural urban differences are more visible in India than in China. In fact, the intersecting Lorenz curves prevents an unambiguous ranking of rural over urban inequality in China unlike in India.

Place Table 2 and Figure 1 here

The poverty rates in the two countries based on the conventional $1 a day poverty line applied to the per capita expenditure figures and calculated at the official exchange and PPP rates, (as reported in Appendix A1), are presented in Table 3. The PPP based head count poverty rates for the two countries (rural and urban combined) in 2005/6 are in line with the corresponding poverty estimates reported in Bardhan (2010, Table 6) quoting Chen and Ravallion (2008), but our estimates for the earlier years are quite different. Note also that, unlike the Indian poverty estimates from Chen and Ravallion (2008), Table 3 reports an increase in the PPP based poverty rates from 0.089 in 1993/94 to 0.263 in 2004/5, the exact reverse of the trend reported in Bardhan (2010).The poverty rates, and even their trend, are much more sensitive to the exchange rate used in case of India than in China. This is partly due to the greater divergence between the official exchange rate and the PPP rate of the Indian Rupee than the Chinese Yuan. On either set of exchange rates, the Indian poverty rate is higher than China's and, in the rural areas, a good deal higher. For example, for the rural and urban areas combined, at PPP rates, the Indian poverty rate in 2005/6 was twice that in China .On official exchange rates, this ratio increases to more than 3.While there has been a general decline in China's poverty rates, the Indian poverty rates have either remained steady or, in case of the urban areas, they have recorded a significant increase during this period. Another point of difference between the two sets of poverty rates is that, while in India the rural poverty rate is always higher than the urban poverty rate, this is not always the case in China.

Place Table 3

The discussion so far has been uni dimensional and money metric in being based on expenditure and (additionally, in case of China) income figures. To get a broader perspective, let us now consider non expenditure dimensions and base the comparison between India and China on multi-dimensional deprivation.

4.2 Multi-Dimensional Deprivation: India vs. China

The dimension specific head count rates of deprivation in the three rounds of NFHS, CHNS ,using equations (1), (2) (with α =1), are presented in Tables 4-9 for India (NFHS1-3) and Tables 10-15 for China (CHNS1993, 2000 and 2006). These tables report the estimates of deprivation separately for rural and urban areas. The estimates allow a comparison of the deprivation magnitudes between India and China and, in each country, a comparison between rural and urban deprivation, and how these magnitudes have changed over time. The overall picture in both countries is a mixed one of declining deprivation in some dimensions and static or even increasing deprivation, in case of others, over this period. The deprivation dimensions in each country vary, often quite sharply, in their magnitude and changes over time. Another point of similarity between India and China is that rural deprivation is generally higher than urban deprivation. There are several differences in the magnitude and trend in deprivation between India and China. For example, while access to drinking water has deteriorated in both rural and urban India over this period, there has been an improvement in access to electricity and in the educational level of the household head. This contrasts with a sharp improvement in access to drinking water in China in both rural and urban areas. Access to electricity stands out as a dimension where the Indian deprivation is much higher than in China. Woman's health, as measured by her BMI, deteriorated in China in both areas with much of this decline taking place in the second half, 2000-2006. The BMI of mother[14] was virtually unchanged in India. Nevertheless, at the end of our period of analysis, China had a large lead over India on women's health, as measured by BMI. China also outperforms

[14] Apart from the fact that, unlike China, we did not have information on the BMI of women in India in NFHS-1, we must keep in mind that while the BMI figures in China are average of the BMI of all adult women in a household, in case of India the BMI is that of the mother.

India on child health at household level in both stunting and wasting with household deprivation in India exceeding that in China in all years and in both sectors. Note, however, that child stunting remains a significant problem in both countries with 1 in 5 households with children reporting deprivation on child height for age at the end of our chosen period. While wasting, i.e. under weight children, has virtually disappeared in China, it remains a significant issue in India. We will provide more direct evidence on child health in the following section when we report estimates of stunting and wasting on individual level data on children.

Place Tables 4-9 and Tables 10-15

These tables, which report the deprivation rates by states in India and by provinces in China, show that the variation in deprivation between regions, as measured by the coefficient of variation (CV), is generally much higher in China than in India and, in case of many dimensions, a good deal higher. This suggests greater unevenness in regional development in China than India with the coastal provinces in China benefitting much more than the interior provinces from globalisation and increased trade during this period. Note, however, that the rural urban differences in deprivation are generally much greater in India than in China.

The decomposability property of the deprivation measure is exploited to calculate the percentage contribution of the dimensions to overall deprivation. These are presented in Tables 16 (India) and 17 (China) and show the relative importance of a dimension as a contributor to total deprivation in each country. These tables also report the variation of the percentage contribution with α which measures the "deprivation aversion". Drinking Water and Clean Fuel for cooking are among the more significant sources of deprivation in both India and China. The importance of Clean Fuel for cooking as a source of rural deprivation seems to increase sharply with α in each country. Given the crucial role that these dimensions play in protecting health, especially that of young children, this could well explain the prevalence of significant child stunting and undernourished maternal health in both countries at the end of the period of analysis. Consistent with our earlier discussion, electricity for lighting matters much more as a source of deprivation in India than in China, as is the case with underweight children or wasting. The relative importance of mother's health as a source of deprivation declines in both countries with an increase in α. Tables 16 and 17 show that, overall, the relative importance of the various deprivation dimensions as contributors to total

deprivation did not change much in either country during this period. Exceptions include access to radio in the urban areas of both countries. The sensitivity to α suggests that the relative importance of the deprivation categories alters significantly as we restrict the analysis to the more deprived households.

Place Table 16 and Table 17

Table 18 presents evidence on the intergenerational transmission of undernourishment from mother to child by reporting the correlation magnitudes at household level between mother's BMI and the proportion of children, aged 0-3 years, in the household who are stunted or wasted. A comparison of the NFHS-3 figures with those from CHNS 2006 shows that there is evidence of a significant negative association between mother's BMI and child wasting in India, but not in China. In other words, the children of undernourished mothers in India are more likely to be wasted than other children. The strength of this correlation has increased in India over the period, 1998/99- 2005/6.More direct evidence on this issue is provided in the next section which presents the results on individual level anthropometric data on the child and her/his mother. This reflects a policy failure in India to delink mother's health from that of her off springs through a nutritional program of antenatal and post natal care. India did not have in place the interventionist programmes in China directed at nutrition such as the National Plan of Action for Nutrition that was approved by the State Council in 1997.

Place Table 18

Table 19 summarises the results of this section by presenting the estimates of multi dimensional deprivation in India and China at two widely dispersed values of α, using the measure given by eq. (6). Consistent with the earlier result of a mixed picture on deprivation, with some dimensions recording a decline while others recorded no change or even a slight increase, Table 19 shows that the aggregate picture on multi dimensional deprivation hasn't changed much in either country over this most recent period, even though both India and China recorded high growth rates throughout the late 1990s and the early part of the new millennium. While rural India recorded a continuous decline in deprivation throughout this

period, urban India experienced rising deprivation in the second half[15], 1998/99- 2005/6. In China, both the rural and urban areas experienced a decline in deprivation during the 1990s that was more than made up by a sharp increase in deprivation in the new millennium. Note that, even at the end of our chosen period, both countries record quite significant amount of multi-dimensional deprivation. Table 19 presents a picture on deprivation in both India and China that is inconsistent with that based on their aggregate growth rates. Table 19 also reveals that though deprivation is rural India is much higher than in rural China, with the gap closing somewhat during this period, there is not much difference between the deprivation magnitudes in their urban areas. In other words, while China outperforms India on rural deprivation by a large margin, this is not true in the urban areas. Note, however, that if we restrict the comparison to the most deprived households, as reflected by the value of $\alpha = 5$, then in both rural and urban areas, Indian deprivation is a good deal worse than in China. Similar to the picture on inequality revealed by the graphs in the bottom panel of Figure 1, the rural urban difference in deprivation is much larger in India than in China. It is worth reiterating from these tables that, notwithstanding their status as "awakening giants", India and China still face considerable amount of multi-dimensional deprivation that is not accurately reflected in their aggregated poverty rates or the mean real expenditure figures.

Place Table 19

4.3 Child Health in India and China- Magnitude and Determinants.

The state of child health, especially of infant children (0-3 years), has figured prominently in the development literature. We provide evidence on this issue in the context of India and China by focussing on the individual data on the health of Indian and Chinese children in the age group of 0-36 months. As pointed out by Dasgupta (1993, Ch. 4), both height for age and weight for height are effective indicators of morbidity and mortality. While height is a summary statistic of a person's past nutritional experience and morbidity, weight for height is a summary statistic of the person's current nutritional status. Between the two, weight for height is taken as a more reliable indicator of the health of the population, especially the child

[15] See Mishra and Ray (2011) for evidence on the failure of urban India to match the improvement in rural living standards during the period of second generation reforms in India.

population. Following the methodology outlined in the seminal article by Waterlow, et. al. (1977), this study uses a child's height (i.e. height for age) and weight for height as good indicators of the child's health and thereby her/his nutritional status. The raw measures of height and weight are converted into z scores by comparison with median figures from a child population in the US. While the Indian (NFHS) data sets contained the z scores for the children, in case of the Chinese (CHNS) data sets, we calculated the z scores using routines provided by the WHO. Considerable care was taken to ensure the accuracy of the calculated z scores for China and consistency with the Indian figures by replicating the z scores in the NFHS data sets from the raw height and weight figures using the WHO supplied routine used to generate z scores in the Chinese data sets.

Table 20 presents the head count rates of stunted and wasted children in the two countries, with "stunting" and "wasting" identified with children whose respective z scores for height for age and weight for height are less than -2[16]. Note that, in case of both countries, the child health statistics are based on a subset of the whole population, namely, children living in the 15 states in India, and the 9 provinces in China considered here. They do not measure the child health in the whole country. Table 20 presents the gender dimension in both countries by reporting the undernourishment rates separately for boys and girls[17]. While there has been a decline in both countries in the proportion of children who are stunted and wasted, China leads India with much lower rates in child stunting and in child wasting. India's dismal performance on child health is evident from the fact that, even in 2005-6, nearly 1 in 2 Indian children in the age group, 0-36 months, suffered from stunting. Note, however, that child stunting remains a significant issue in China as well, with 1 in 5 Chinese children suffering from stunting in 2006. Table 20 confirms our earlier observation that wasting, i.e., the problem of underweight children, is less of an issue in China than in India. The figures show that the proportion of children who suffer from wasting in India is nearly three times that in China. The superior state of child health in China over India is also evident from Figure 2 which presents the kernel density graphs for children in both countries for height for age and weight for height, respectively at the end of our chosen period. While, as Fig. 2 shows, the lead of China over India on weight for height is large, the superiority on height for age is also

[16] See WHO (1985) for an account and use of these standards.

[17] See, also, Arnold, Parasuraman, Arokiasamy and Kothari (2009) for an analysis of child health in India based on the NFHS-3 data set.

unmistakeable. Among children, weight for height is a better predictor in the short run of morbidity and mortality than height for age, and is regarded as a better indicator of child health. The huge gap between the rates of child stunting and wasting in India and China at the end of the sample period is a clear indicator of China's superiority over India on child health. Though wasting is a short run deficiency, low birth weights are associated with high mortality and, consequently, weight statistics are taken seriously in the literature of child health in the context of development. Notwithstanding the optimistic picture in China, Table 20 reveals that there is still considerable amount of child stunting in both countries. This adds to our earlier evidence presented in Table 19 on significant amount of multi dimensional deprivation prevailing in both countries at the end of our period. In fact, as the following evidence shows, the issues of child health and deprivation are not unrelated, especially in the context of India. Table 20 also reports anaemic rates of young children (0-36 months) in India, with a child being considered anaemic if that child's haemoglobin count is less than 11. One in two children in India is anaemic. Though the CNHS data did not contain such information for Chinese children, in 1998 China National Nutrition Surveillance reported that the rate of iron deficiency anaemia in children under six years of age was 16.8 %. It showed that anaemia existed not only in poor areas in China but also in developed areas such as Guangdong (22.4 %) and Jiangsu (17.1 %). Among children less than two years old, more than one quarter were suffering from anaemia. Anaemia was reported to be highest among Chinese infants of six months, with a prevalence rate of 50 % in rural areas in 2000, which is similar to the high anaemic rates of Indian children calculated by us on NFHS-3 data. The prevalence of such high anaemic rates in infant children in both countries partly explains their high stunting rates in view of the Indian evidence reported below on the strong association between anaemia and stunting in very young children.

Place Table 20 and Figure 2 here

Tables 21 and 22 present the OLS estimates of regression in India and China, respectively, of the two indicators of child health, namely, the z scores for height for age and weight for height on a selection of determinants. Appendix Table A2 contains full explanation of the variable names that appear in these tables. The Indian regressions were performed on the data set of NFHS-3 pooled over boys and girls and over rural and urban areas. In case of China, which had a limited number of children in each round, we pooled the 3 data sets over the three rounds to increase the sample size. There are several differences between the estimates

of the Indian and Chinese regressions. All the deprivation dimensions have highly significant effect on height for age of infant children in India, but the effects are much weaker in size and significance in case of short run nutritional status that is measured by weight for height. For example, children in households that have no access to electricity or to toilet or to clean fuel for cooking have inferior long run health status to other children. The education of the household head also has a significant effect on the child's long term nutritional status with children from well educated households recording superior z scores for height for age. Once again, the effect weakens size and significance in case of weight for height. Lack of access to toilet and to clean fuel for cooking has strong and significant negative effects on the child's weight for height. In contrast, the effects of the deprivation dimensions on child health are mostly insignificant in China, with exceptions in case of access to drinking water for height for age, and access to toilet for weight for height. These latter effects are however much stronger than in case of India. Overall, these tables provide evidence of a strong link between a household's deprivation on a variety of dimensions and the long run health status of its children. The regional effects on child health are much stronger in India than in China where they are nonexistent.

Consistent with the earlier evidence at household level, Table 21 provides Indian evidence that suggests a strong link between an undernourished mother and an undernourished child. The positive association between low BMI of mother and low z scores of her infant children is of similar magnitude for both the measures of child health. Correspondingly, obese mothers are associated with obese children. Table 21 also shows that an anaemic child will face retarded growth both in the long and short run, though the magnitude of this effect is much weaker in the short run. However, the relationship between wasting and anaemia remains significant. The link between the health of the mother and that of her child is much weaker in China to the point of insignificance between BMI and z scores consistent with the correlation estimates at household level presented in Table 18. There are significant gender effects with boys recording inferior z scores than girls for height for age in India and weight for height in China, after controlling for a variety of household and other characteristics. Rural children in India enjoy superior long run health than urban children, after controlling for the various other characteristics, but there are no such sectoral effects in China. The children of scheduled classes and tribes in India record inferior z scores to those from the non backward classes, with the effects much stronger in the long run. There are some regional

effects of the child's state of residence on the z scores in India but there are no provincial effects in China.

Place Table 21 and Table 22 here

Tables 21 and 22 do not distinguish children by their health status. To do so, we performed multinomial logit estimation of the following child health categories on stunting and wasting; extremely stunted/wasted ($z<-3$), moderately stunted/wasted ($-3<z<-2$), normal ($-2<z<2$), obese ($z>2$). The "normal" child was adopted as the default category. The parameter estimates and the marginal effects are reported in Tables 23 and 24.To save space and for clarity of presentation, we report in Table 23 (stunting) and 24(wasting) the coefficient estimates for India and China of only the deprivation dimensions and of the child's anaemic status and the mother's nutritional status. Tables 23 and 24 confirm that the link between a household's deprivation in multiple dimensions and its child's nutritional deprivation is much stronger in India than in China. Between the two measures of child health, multidimensional deprivation has greater effect on stunting than on wasting in both countries. Lack of household access in India to each of the deprivation categories considered in this study pushes the child from a state of "normal health" to a state of "extreme stunting". The push to the category of "moderate stunting" is significant but of smaller magnitude. Similarly, an anaemic child or the child of an undernourished mother with a low BMI is more likely to be extremely or moderately stunted than the child of a mother with a BMI in the normal range. The corresponding effects in China are weakly significant or absent altogether.

Place Tables 23 and 24 here

4.3 Summary and Conclusions.

This study takes place against a background of mounting interest in the comparative economic performances of India and China. These countries, referred to recently as the "awakening giants", have several parallels that make a comparison between them of much interest. Both countries undertook a process of economic reforms that ushered in a period of significant economic growth during the 1990s and beyond. Apart from their sheer size in terms of population and gross national product, India and China have in recent years recorded some of the highest growth rates in the world. Both these economies weathered the storm of

the Asian financial crisis and the more recent global financial crisis reasonably well. However, India and China have followed different models of economic development within the framework of vastly different political systems.

While much of the recent comparisons between India and China have taken place on macro variables such as trade volume and growth rates, this study marks a departure in basing the comparison on multidimensional deprivation in the two countries with special attention paid to health deprivation, especially that of young children. The comparisons are made on two micro data sets, namely, the National Family Health Survey (NFHS) for India and the China Nutrition and Health Survey (CHNS) for China .These data sets seem to be tailor made for this study since both of them are micro data sets, cover proximate periods, and contain a wealth of demographic, expenditure and health information that have a great deal of commonality. Both these data sets enjoy official approval with the NFHS conducted under the stewardship of the Ministry of Family and Health Welfare in India, and the CHNS receiving joint approval in 2002 of the Ministries of Health, Science and Technology and the Statistic Bureau of China. Both these data sets are recognised for their high quality as reflected in an increasing number of studies based on them. This study uses the recent approach of multidimensional deprivation measurement that takes account of deprivation on a wide range of dimensions and aggregates them into a single measure. Besides containing the comparative picture on multi dimensional deprivation in the two giant economies, this study also documents regional variation in the magnitude and trend in deprivation within each country.

Several common features and differences emerge from the bilateral comparisons. In neither country is there a close correspondence between trends in conventional poverty rates and in multi dimensional deprivation. The optimistic scenario generated by the high growth rates in India and China in the 1990s and beyond is not translated into large declines in deprivation in either country. While rural India records a continuous drop in multidimensional deprivation, this is not the case elsewhere. Even in the new millennium, both countries record high levels of deprivation in several dimensions, though these are not necessarily the same dimensions in India and China. For example, a large proportion of households in both countries still lack easy access to drinking water and to clean fuel for cooking. These results take on policy significance in view of our finding that deprivation in these dimensions has a significantly adverse effect on child health. There is greater variation in the deprivation levels between

provinces in China than between the States in India. In contrast, there is much greater rural urban variation in inequality and deprivation in India than in China. India outperforms China in having lower expenditure inequality in both areas. While rural deprivation in India is much higher than in China, urban deprivation in the two countries are similar if we consider all households who suffer deprivation in one or more dimensions. The picture changes drastically in favour of China if we restrict the comparison to the more deprived households in the urban areas.

The paper presents evidence that suggests a link in both countries between the presence of a stunted child in the household and the household's lack of access to a variety of basic necessities including primary education of the household head. This link is much stronger in India than in China. China outperforms India on the health of young children, aged 0-36 months. While wasting is not much of an issue in China, it remains a serious issue in India This presents India with a severe handicap since wasting is usually regarded as the more reliable indicator of child health. The superiority of China over India on child stunting is also unmistakeable though the gap is much narrower than for wasting. Denying their status as "emerging superpower economies", this paper documents evidence that India and China still experience large rates of child stunting with 1 in 3 children recording stunted growth in both countries. A point of difference is that in India the child of a malnourished mother (with low BMI) is at very high risk from stunting and wasting unlike in China. This can be put down to policy failure in India which has not seen the sort of nutritionist interventions that were implemented in China. The study reports high rates of anaemic children in India with one in two children suffering from anaemia, and also provides evidence of a strong link between anaemia and stunting in very young children. Recent evidence suggests that child anaemia is also a serious issue in China. Notwithstanding evidence of decline in mother's BMI over this period, China outperforms India on women's health as well.

The overall message of this study is a mixed one. During this most recent period, both India and China have seen significant improvements in their living standards and decline in deprivation across a wide range of dimensions. However, both countries still have a long way to go to justify the current media hype over their status as "awakening giants". While China's superiority over India on a wide range of deprivation measures is clear, this paper also presents evidence that shows that this superiority is not a one way affair. Both countries still record high levels of child stunting and child anaemia. Clearly, one needs an integrated

approach in both countries to achieve increased access to basic facilities and improvements in child health.

This study underlines the need to look beyond macro statistics such as per capita income or growth rates and explore issues such as deprivation on a wide variety of dimensions where the picture looks much less rosy. This study can be usefully extended to similar comparison of deprivation between other comparable economies based on a wide range of health and non health indicator

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Tables

Table1: Monthly per Capita Expenditure[a] in India and China

India					China				
	At US $ Exchange Rate[b]		At PPP Rate[b]			At US $ Exchange Rate[b]		At PPP Rate[b]	
	Rural	**Urban**	**Rural**	**Urban**		**Rural**	**Urban**	**Rural**	**Urban**
NSS 50 (1993-1994)	16.23	37.23	49.41	113.34	**CHNS 1993**	11.48	20.56	26.34	47.14
NSS 55 (1999-2000)	13.90	26.74	45.89	88.30	**CHNS 2000**	9.30	29.76	23.37	74.81
NSS 61 (20042005)	15.45	24.56	46.35	73.67	**CHNS 2006**	16.11	31.92	37.11	73.55

a. Monthly per capita expenditure figures for India and China are at constant prices. For India prices prevailing (Consumer Price Index for Agriculture Labourers for rural areas and Consumer Price Index for Industrial Workers for urban areas) in 61st round (2004 July- 2005 June) and for China, prices prevailing in 2006 are used as base.

b. US $ exchange rates and PPP rates are sourced from Federal Reserve Bank of New-York annual statistical releases and World Economic Outlook Database (Oct, 2009) respectively.

Table 2: Gini Coefficients on Expenditure and Income Inequality for India and China

India							China						
	Expenditure[a] Inequality			Income Inequality				Expenditure[a] Inequality			Income[b] Inequality		
	Rural	Urban	Combined	Rural	Urban	Combined		Rural	Urban	Combined	Rural	Urban	Combined
NSS 50 (1993-1994)	0.315	0.390	0.381	N.A.	N.A.	N.A.	**CHNS 1993**	0.574	0.796	0.637	0.425	0.373	0.412
NSS 55 (1999-2000)	0.299	0.349	0.354	N.A.	N.A.	N.A.	**CHNS 2000**	0.603	0.770	0.675	0.452	0.409	0.443
NSS 61 (2004-2005)	0.336	0.393	0.380	N.A.	N.A.	N.A.	**CHNS 2006**	0.685	0.681	0.700	0.510	0.474	0.506

a. Expenditure figures for India and China are monthly per capita at constant prices. For India prices prevailing (Consumer Price Index for Agriculture Labourers for rural areas and Consumer Price Index for Industrial Workers for urban areas) in 61st round (2004 July- 2005 June) and for China, prices prevailing in 2006 are used as base.

b. Income figures for China are per capita household income at 2006 prices.

Table 3: Head Count Poverty Rates[a] for India and China

India							China						
	Poverty Rate at 1$/day Exchange rate[b]			Poverty Rate 1$/day PPP Conversion rate[b]				Poverty Rate at 1$/day Exchange rate[b]			Poverty Rate 1$/day PPP Conversion rate[b]		
	Rural	Urban	Combined	Rural	Urban	Combined		Rural	Urban	Combined	Rural	Urban	Combined
NSS 50 (1993-1994)	0.910	0.527	0.757	0.211	0.018	0.089	**CHNS 1993**	0.394	0.504	0.406	0.146	0.281	0.162
NSS 55 (1999-2000)	0.949	0.709	0.858	0.278	0.055	0.174	**CHNS 2000**	0.361	0.297	0.354	0.128	0.141	0.129
NSS 61 (2004-2005)	0.930	0.744	0.864	0.322	0.156	0.263	**CHNS 2006**	0.270	0.140	0.256	0.134	0.068	0.128

a. Poverty Rates are calculated for monthly per capita expenditure of a household for India and China and 1$/ day is multiplied by 30 (assuming 30 days a month) to calculate the poverty line

b. US $ exchange rates and PPP rates are sourced from Federal Reserve Bank of New-York annual statistical releases and World Economic Outlook Database (Oct, 2009) respectively. Monthly per capita expenditure figures for India and China are at constant prices. For India prices prevailing (Consumer Price Index for Agriculture Labourers for rural areas and Consumer Price Index for Industrial Workers for urban areas) in 61st round (2004 July- 2005 June) and for China, prices prevailing in 2006 are used as base.

Table 4: Dimension Specific Head-Count Rates for Rural Areas NFHS 1

	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest Wealth Quintile	Share of Stunted Children[d]	Share of Wasted Children[d]	BMI of the Mother[e]
Andhra Pradesh	0.88	0.46	0.95	0.92	0.62	0.71	0.65	0.17	0.00	0.00	N.A.
Assam[f]	0.72	0.72	0.95	0.45	0.42	0.65	0.70	0.22	0.14	0.04	N.A.
Bihar[f]	0.62	0.93	0.99	0.92	0.60	0.66	0.78	0.37	0.24	0.07	N.A.
Gujarat	0.62	0.30	0.82	0.83	0.43	0.68	0.68	0.16	0.13	0.05	N.A.
Jammu & Kashmir	0.68	0.16	0.84	0.94	0.52	0.78	0.41	0.10	0.11	0.03	N.A.
Karnataka	0.84	0.47	0.95	0.91	0.54	0.73	0.57	0.17	0.14	0.04	N.A.
Kerala	0.38	0.46	0.94	0.34	0.17	0.79	0.42	0.02	0.06	0.03	N.A.
Madhya Pradesh[f]	0.87	0.47	0.98	0.95	0.58	0.58	0.76	0.32	0.00	0.00	N.A.
Maharashtra	0.74	0.37	0.89	0.90	0.45	0.66	0.68	0.19	0.14	0.05	N.A.
Orissa	0.86	0.80	0.98	0.95	0.51	0.54	0.73	0.34	0.13	0.05	N.A.
Punjab[f]	0.57	0.12	0.89	0.86	0.52	0.53	0.54	0.03	0.08	0.02	N.A.
Rajasthan	0.80	0.58	0.98	0.93	0.64	0.72	0.75	0.36	0.11	0.05	N.A.
Tamil Nadu	0.82	0.45	0.94	0.91	0.41	0.65	0.65	0.11	0.00	0.00	N.A.
Uttar Pradesh[f]	0.57	0.80	0.99	0.93	0.54	0.46	0.72	0.36	0.25	0.06	N.A.
West Bengal	0.77	0.86	0.99	0.81	0.45	0.52	0.63	0.37	0.00	0.00	N.A.
C.V.[g]	**0.20**	**0.47**	**0.06**	**0.22**	**0.23**	**0.16**	**0.18**	**0.58**	**0.78**	**0.73**	**N.A.**
All India	**0.70**	**0.55**	**0.95**	**0.84**	**0.50**	**0.62**	**0.66**	**0.23**	**0.11**	**0.04**	**N.A.**

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

f. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for NFHS3).

g. Coefficient of Variation

Table 5: Dimension Specific Head-Count Rates for Rural Areas NFHS 2

	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest Wealth Quintile	Share of Stunted Children[d]	Share of Wasted Children[d]	BMI of the Mother[e]
Andhra Pradesh	0.88	0.32	0.89	0.87	0.56	0.63	0.68	0.25	0.08	0.02	0.11
Assam[f]	0.77	0.61	0.92	0.32	0.35	0.59	0.67	0.18	0.10	0.03	0.07
Bihar[f]	0.57	0.89	0.97	0.89	0.52	0.57	0.74	0.49	0.16	0.06	0.11
Gujarat	0.58	0.23	0.82	0.79	0.38	0.58	0.72	0.15	0.10	0.04	0.12
Jammu & Kashmir	0.60	0.13	0.82	0.60	0.47	0.78	0.38	0.04	0.11	0.03	0.10
Karnataka	0.86	0.26	0.91	0.86	0.49	0.63	0.56	0.20	0.08	0.05	0.10
Kerala	0.90	0.33	0.87	0.17	0.16	0.74	0.36	0.03	0.04	0.02	0.04
Madhya Pradesh[f]	0.89	0.39	0.95	0.92	0.43	0.55	0.81	0.27	0.15	0.05	0.12
Maharashtra	0.75	0.28	0.83	0.85	0.32	0.61	0.74	0.23	0.11	0.06	0.14
Orissa	0.92	0.71	0.95	0.92	0.41	0.45	0.71	0.53	0.11	0.06	0.12
Punjab[f]	0.50	0.08	0.78	0.75	0.43	0.46	0.56	0.01	0.10	0.02	0.08
Rajasthan	0.79	0.46	0.96	0.89	0.53	0.60	0.73	0.26	0.17	0.04	0.13
Tamil Nadu	0.88	0.27	0.86	0.87	0.36	0.51	0.56	0.18	0.06	0.03	0.07
Uttar Pradesh[f]	0.53	0.77	0.95	0.88	0.46	0.40	0.72	0.34	0.13	0.02	0.09
West Bengal	0.75	0.81	0.96	0.72	0.40	0.47	0.67	0.39	0.11	0.03	0.15
C.V.[g]	**0.20**	**0.59**	**0.07**	**0.30**	**0.24**	**0.18**	**0.21**	**0.65**	**0.33**	**0.38**	**0.28**
All India	**0.72**	**0.48**	**0.91**	**0.77**	**0.43**	**0.55**	**0.66**	**0.25**	**0.12**	**0.04**	**0.10**

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

f. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for NFHS3).

g. Coefficient of Variation

Table 6: Dimension Specific Head-Count Rates for Rural Areas NFHS 3

	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest Wealth Quintile	Share of Stunted Children[d]	Share of Wasted Children[d]	BMI of the Mother[e]
Andhra Pradesh	0.81	0.15	0.83	0.73	0.53	0.55	0.85	0.16	0.08	0.02	0.09
Assam[f]	0.95	0.43	0.84	0.19	0.33	0.49	0.62	0.15	0.12	0.04	0.10
Bihar[f]	1.00	0.81	0.97	0.84	0.60	0.47	0.71	0.35	0.21	0.09	0.22
Gujarat	0.53	0.17	0.78	0.70	0.36	0.49	0.76	0.12	0.13	0.04	0.15
Jammu & Kashmir	0.70	0.10	0.80	0.49	0.44	0.80	0.35	0.04	0.09	0.04	0.11
Karnataka	0.84	0.16	0.89	0.78	0.50	0.61	0.71	0.17	0.08	0.03	0.09
Kerala	0.93	0.11	0.79	0.05	0.12	0.63	0.48	0.02	0.04	0.03	0.04
Madhya Pradesh[f]	0.96	0.36	0.97	0.92	0.49	0.44	0.82	0.52	0.15	0.07	0.17
Maharashtra	0.63	0.29	0.81	0.79	0.33	0.55	0.75	0.21	0.09	0.03	0.11
Orissa	1.00	0.62	0.97	0.88	0.43	0.36	0.80	0.48	0.11	0.04	0.14
Punjab[f]	0.65	0.06	0.81	0.55	0.39	0.45	0.64	0.03	0.08	0.03	0.09
Rajasthan	0.86	0.46	0.97	0.92	0.55	0.60	0.80	0.35	0.14	0.06	0.15
Tamil Nadu	0.85	0.16	0.83	0.83	0.37	0.50	0.66	0.19	0.04	0.03	0.06
Uttar Pradesh[f]	0.99	0.72	0.96	0.84	0.50	0.24	0.69	0.36	0.18	0.03	0.15
West Bengal	0.99	0.65	0.97	0.55	0.45	0.35	0.70	0.36	0.12	0.05	0.17
C.V.[g]	**0.18**	**0.72**	**0.09**	**0.39**	**0.28**	**0.26**	**0.19**	**0.69**	**0.44**	**0.45**	**0.38**
All India	**0.86**	**0.36**	**0.88**	**0.66**	**0.43**	**0.47**	**0.69**	**0.24**	**0.11**	**0.04**	**0.12**

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

f. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for NFHS3).

g. Coefficient of Variation

Table 7: Dimension Specific Head-Count Rates for Urban Areas NFHS 1

	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest Wealth Quintile	Share of Stunted Children[d]	Share of Wasted Children[d]	BMI of the Mother[e]
Andhra Pradesh	0.51	0.15	0.39	0.30	0.25	0.44	0.35	0.01	0.00	0.00	N.A.
Assam[f]	0.40	0.27	0.55	0.06	0.19	0.45	0.43	0.02	0.08	0.02	N.A.
Bihar[f]	0.36	0.34	0.65	0.34	0.26	0.40	0.45	0.05	0.16	0.06	N.A.
Gujarat	0.32	0.12	0.28	0.29	0.23	0.42	0.41	0.00	0.10	0.03	N.A.
Jammu & Kashmir	0.18	0.00	0.16	0.23	0.22	0.60	0.21	0.00	0.07	0.02	N.A.
Karnataka	0.45	0.15	0.41	0.26	0.24	0.49	0.31	0.02	0.09	0.04	N.A.
Kerala	0.34	0.24	0.75	0.16	0.15	0.64	0.35	0.00	0.04	0.02	N.A.
Madhya Pradesh[f]	0.39	0.10	0.47	0.25	0.22	0.31	0.41	0.01	0.00	0.00	N.A.
Maharashtra	0.33	0.13	0.17	0.18	0.18	0.58	0.42	0.01	0.09	0.03	N.A.
Orissa	0.59	0.31	0.68	0.50	0.25	0.31	0.45	0.03	0.07	0.03	N.A.
Punjab[f]	0.21	0.04	0.18	0.19	0.21	0.41	0.33	0.00	0.09	0.02	N.A.
Rajasthan	0.27	0.13	0.49	0.34	0.31	0.48	0.41	0.03	0.09	0.05	N.A.
Tamil Nadu	0.55	0.19	0.48	0.30	0.18	0.51	0.38	0.01	0.00	0.00	N.A.
Uttar Pradesh[f]	0.18	0.19	0.48	0.20	0.28	0.35	0.45	0.02	0.16	0.04	N.A.
West Bengal	0.60	0.28	0.60	0.17	0.24	0.51	0.45	0.04	0.00	0.00	N.A.
C.V.[g]	**0.37**	**0.56**	**0.41**	**0.41**	**0.18**	**0.22**	**0.17**	**0.92**	**0.77**	**0.77**	**N.A.**
All India	**0.34**	**0.15**	**0.40**	**0.23**	**0.22**	**0.45**	**0.38**	**0.01**	**0.08**	**0.02**	**N.A.**

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

f. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for NFHS3).

g. Coefficient of Variation

Table 8: Dimension Specific Head-Count Rates for Urban Areas NFHS 2

	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest Wealth Quintile	Share of Stunted Children[d]	Share of Wasted Children[d]	BMI of the Mother[e]
Andhra Pradesh	0.54	0.08	0.29	0.28	0.24	0.38	0.55	0.03	0.06	0.02	0.07
Assam[f]	0.45	0.15	0.38	0.03	0.14	0.45	0.49	0.02	0.05	0.01	0.04
Bihar[f]	0.36	0.28	0.63	0.34	0.24	0.35	0.51	0.06	0.09	0.04	0.08
Gujarat	0.21	0.06	0.20	0.23	0.17	0.30	0.55	0.02	0.07	0.02	0.06
Jammu & Kashmir	0.11	0.01	0.12	0.11	0.26	0.52	0.22	0.00	0.05	0.01	0.04
Karnataka	0.42	0.06	0.28	0.19	0.18	0.37	0.36	0.03	0.05	0.03	0.06
Kerala	0.77	0.12	0.65	0.07	0.09	0.49	0.28	0.01	0.02	0.01	0.03
Madhya Pradesh[f]	0.49	0.07	0.42	0.33	0.19	0.31	0.58	0.03	0.09	0.04	0.08
Maharashtra	0.28	0.02	0.07	0.08	0.15	0.62	0.45	0.01	0.05	0.03	0.07
Orissa	0.69	0.25	0.48	0.45	0.23	0.26	0.52	0.17	0.08	0.05	0.09
Punjab[f]	0.14	0.01	0.09	0.09	0.16	0.32	0.36	0.00	0.06	0.01	0.04
Rajasthan	0.20	0.06	0.39	0.23	0.23	0.36	0.49	0.01	0.10	0.02	0.09
Tamil Nadu	0.54	0.09	0.22	0.20	0.14	0.41	0.40	0.03	0.05	0.03	0.05
Uttar Pradesh[f]	0.21	0.13	0.38	0.17	0.23	0.30	0.51	0.02	0.09	0.02	0.06
West Bengal	0.57	0.12	0.31	0.06	0.15	0.49	0.46	0.02	0.03	0.01	0.05
C.V.[g]	**0.51**	**0.79**	**0.54**	**0.63**	**0.27**	**0.25**	**0.23**	**1.34**	**0.36**	**0.55**	**0.32**
All India	**0.35**	**0.08**	**0.26**	**0.16**	**0.17**	**0.40**	**0.44**	**0.02**	**0.06**	**0.02**	**0.06**

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

f. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for NFHS3).

g. Coefficient of Variation

Table 9: Dimension Specific Head-Count Rates for Urban Areas NFHS 3

	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest Wealth Quintile	Share of Stunted Children[d]	Share of Wasted Children[d]	BMI of the Mother[e]
Andhra Pradesh	0.27	0.03	0.17	0.10	0.26	0.41	0.76	0.02	0.05	0.01	0.05
Assam[f]	0.68	0.11	0.35	0.01	0.16	0.41	0.52	0.02	0.06	0.03	0.05
Bihar[f]	0.88	0.26	0.50	0.27	0.33	0.37	0.62	0.09	0.11	0.07	0.11
Gujarat	0.17	0.02	0.20	0.12	0.15	0.27	0.62	0.01	0.10	0.03	0.08
Jammu & Kashmir	0.17	0.01	0.15	0.14	0.27	0.50	0.30	0.00	0.04	0.02	0.03
Karnataka	0.60	0.03	0.28	0.17	0.21	0.47	0.59	0.03	0.05	0.02	0.06
Kerala	0.75	0.05	0.58	0.02	0.10	0.45	0.47	0.00	0.03	0.02	0.03
Madhya Pradesh[f]	0.55	0.04	0.27	0.19	0.16	0.21	0.60	0.03	0.08	0.06	0.09
Maharashtra	0.20	0.03	0.14	0.08	0.13	0.43	0.56	0.01	0.06	0.02	0.06
Orissa	0.70	0.16	0.52	0.41	0.18	0.19	0.71	0.13	0.07	0.02	0.07
Punjab[f]	0.28	0.01	0.13	0.09	0.18	0.42	0.55	0.00	0.05	0.02	0.05
Rajasthan	0.19	0.04	0.30	0.15	0.19	0.29	0.63	0.01	0.07	0.05	0.11
Tamil Nadu	0.56	0.05	0.20	0.13	0.17	0.39	0.54	0.02	0.04	0.03	0.05
Uttar Pradesh[f]	0.57	0.11	0.36	0.13	0.27	0.23	0.58	0.03	0.11	0.02	0.08
West Bengal	0.59	0.06	0.28	0.04	0.21	0.48	0.51	0.01	0.04	0.02	0.05
C.V.[g]	**0.50**	**0.98**	**0.49**	**0.74**	**0.30**	**0.28**	**0.18**	**1.25**	**0.41**	**0.57**	**0.38**
All India	**0.45**	**0.06**	**0.25**	**0.11**	**0.19**	**0.37**	**0.58**	**0.02**	**0.06**	**0.03**	**0.06**

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

f. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for NFHS3).

g. Coefficient of Variation

Table 10: Dimension Specific Head-Count Rates for Rural Areas CHNS 1993

Provinces	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest income Quintile[d]	Share of Stunted Children[e]	Share of Wasted Children[e]	BMI of the Women[f]
Liaoning	0.575	0.000	0.900	0.147	0.116	0.120	0.506	0.185	0.019	0.004	0.050
Heilongjiang	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Jiangsu	0.684	0.022	0.899	0.402	0.294	0.108	0.598	0.174	0.016	0.006	0.051
Shandong	0.816	0.010	0.852	0.082	0.275	0.033	0.354	0.210	0.007	0.000	0.030
Henan	0.923	0.077	0.990	0.171	0.288	0.130	0.492	0.375	0.043	0.003	0.050
Hubei	0.705	0.037	0.949	0.254	0.271	0.173	0.620	0.336	0.061	0.003	0.064
Hunan	0.517	0.003	0.943	0.101	0.292	0.383	0.701	0.215	0.030	0.003	0.060
Guangxi	0.503	0.010	0.852	0.245	0.302	0.097	0.587	0.218	0.023	0.000	0.144
Guizhou	0.614	0.009	0.997	0.297	0.456	0.547	0.728	0.250	0.060	0.006	0.051
C.V.[g]	**0.220**	**1.202**	**0.061**	**0.508**	**0.319**	**0.878**	**0.211**	**0.294**	**0.627**	**0.723**	**0.553**
All China	**0.669**	**0.021**	**0.923**	**0.215**	**0.291**	**0.202**	**0.575**	**0.246**	**0.033**	**0.003**	**0.062**

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

g. Coefficient of Variation

Table 11: Dimension Specific Head-Count Rates for Rural Areas CHNS 2000

Provinces	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest income Quintile[d]	Share of Stunted Children[e]	Share of Wasted Children[e]	BMI of the Women[f]
Liaoning	0.341	0.003	0.550	0.053	0.063	0.156	0.547	0.109	0.003	0.003	0.072
Heilongjiang	0.749	0.006	0.630	0.141	0.113	0.238	0.470	0.295	0.009	0.003	0.053
Jiangsu	0.459	0.012	0.619	0.160	0.193	0.091	0.568	0.142	0.006	0.000	0.030
Shandong	0.747	0.019	0.713	0.096	0.213	0.096	0.559	0.210	0.009	0.000	0.025
Henan	0.854	0.040	0.942	0.122	0.237	0.216	0.611	0.371	0.040	0.003	0.024
Hubei	0.628	0.046	0.851	0.127	0.214	0.263	0.638	0.269	0.006	0.000	0.053
Hunan	0.394	0.009	0.870	0.090	0.224	0.727	0.745	0.320	0.012	0.003	0.053
Guangxi	0.634	0.055	0.515	0.105	0.189	0.125	0.642	0.148	0.026	0.009	0.070
Guizhou	0.450	0.009	0.882	0.109	0.362	0.762	0.788	0.262	0.047	0.003	0.056
C.V.[g]	**0.308**	**0.848**	**0.224**	**0.298**	**0.337**	**0.868**	**0.137**	**0.407**	**0.889**	**1.097**	**0.401**
All China	**0.584**	**0.022**	**0.730**	**0.111**	**0.202**	**0.298**	**0.620**	**0.236**	**0.018**	**0.003**	**0.048**

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

g. Coefficient of Variation

Table 12: Dimension Specific Head-Count Rates for Rural Areas CHNS 2006

Provinces	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest income Quintile[d]	Share of Stunted Children[e]	Share of Wasted Children[e]	BMI of the Women[f]
Liaoning	0.398	0.006	0.385	0.073	0.095	0.398	0.807	0.159	0.009	0.003	0.076
Heilongjiang	0.657	0.003	0.455	0.022	0.109	0.530	0.885	0.181	0.000	0.003	0.047
Jiangsu	0.311	0.006	0.492	0.136	0.193	0.124	0.755	0.127	0.000	0.000	0.048
Shandong	0.596	0.006	0.605	0.102	0.272	0.151	0.787	0.235	0.012	0.003	0.040
Henan	0.892	0.006	0.847	0.153	0.237	0.297	0.868	0.309	0.012	0.006	0.042
Hubei	0.563	0.048	0.734	0.069	0.198	0.401	0.862	0.272	0.009	0.000	0.048
Hunan	0.238	0.015	0.803	0.082	0.256	0.779	0.856	0.253	0.035	0.006	0.044
Guangxi	0.541	0.012	0.453	0.098	0.228	0.249	0.831	0.272	0.030	0.015	0.071
Guizhou	0.386	0.000	0.806	0.144	0.425	0.906	0.986	0.264	0.028	0.006	0.042
C.V.[g]	**0.397**	**1.154**	**0.297**	**0.445**	**0.329**	**0.587**	**0.054**	**0.282**	**0.951**	**1.053**	**0.264**
All China	**0.507**	**0.011**	**0.623**	**0.098**	**0.226**	**0.432**	**0.850**	**0.231**	**0.015**	**0.005**	**0.051**

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

g. Coefficient of Variation

Table 13: Dimension Specific Head-Count Rates for Urban Areas CHNS 1993

Provinces	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest income Quintile[d]	Share of Stunted Children[e]	Share of Wasted Children[e]	BMI of the Women[f]
Liaoning	0.074	0.000	0.133	0.148	0.089	0.089	0.148	0.037	0.015	0.000	0.059
Heilongjiang	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Jiangsu	0.453	0.000	0.434	0.160	0.330	0.104	0.321	0.009	0.009	0.000	0.028
Shandong	0.645	0.018	0.718	0.191	0.400	0.291	0.300	0.100	0.027	0.000	0.027
Henan	0.545	0.008	0.765	0.318	0.303	0.098	0.311	0.174	0.015	0.000	0.045
Hubei	0.273	0.000	0.583	0.115	0.273	0.173	0.374	0.050	0.014	0.000	0.043
Hunan	0.154	0.000	0.399	0.021	0.252	0.147	0.385	0.056	0.000	0.007	0.056
Guangxi	0.268	0.013	0.660	0.366	0.418	0.131	0.438	0.150	0.026	0.000	0.039
Guizhou	0.518	0.000	0.883	0.270	0.358	0.701	0.650	0.161	0.051	0.051	0.095
C.V.[g]	**0.555**	**1.499**	**0.421**	**0.571**	**0.343**	**0.951**	**0.391**	**0.683**	**0.776**	**2.462**	**0.442**
All China	**0.354**	**0.005**	**0.573**	**0.201**	**0.301**	**0.217**	**0.371**	**0.095**	**0.018**	**0.008**	**0.050**

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

g. Coefficient of Variation

Table 14: Dimension Specific Head-Count Rates for Urban Areas CHNS 2000

Provinces	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest income Quintile[d]	Share of Stunted Children[e]	Share of Wasted Children[e]	BMI of the Women[f]
Liaoning	0.136	0.012	0.056	0.062	0.062	0.173	0.302	0.093	0.006	0.006	0.056
Heilongjiang	0.165	0.013	0.335	0.070	0.120	0.513	0.285	0.063	0.013	0.000	0.038
Jiangsu	0.141	0.055	0.080	0.098	0.190	0.104	0.331	0.018	0.012	0.006	0.037
Shandong	0.426	0.012	0.444	0.272	0.235	0.179	0.438	0.111	0.012	0.000	0.012
Henan	0.293	0.014	0.633	0.231	0.204	0.156	0.401	0.163	0.000	0.000	0.075
Hubei	0.244	0.012	0.354	0.024	0.232	0.299	0.543	0.159	0.006	0.000	0.037
Hunan	0.139	0.018	0.145	0.024	0.181	0.452	0.506	0.084	0.006	0.000	0.042
Guangxi	0.298	0.054	0.333	0.196	0.280	0.220	0.518	0.179	0.042	0.000	0.083
Guizhou	0.175	0.025	0.850	0.163	0.275	0.781	0.669	0.150	0.044	0.000	0.081
C.V.[g]	**0.454**	**0.801**	**0.659**	**0.794**	**0.367**	**0.564**	**0.245**	**0.509**	**1.045**	**1.852**	**0.483**
All China	**0.223**	**0.024**	**0.354**	**0.126**	**0.198**	**0.320**	**0.445**	**0.113**	**0.011**	**0.001**	**0.051**

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

g. Coefficient of Variation

Table 15: Dimension Specific Head-Count Rates for Urban Areas CHNS 2006

Provinces	Access to Source of Drinking Water on its Premises	Access to Electricity for Lighting	Access to Clean Fuel for Cooking[a]	Access to Toilet Facility[b]	Education of the Head of the Household Head[c]	Access to Bicycle	Access to Radio	Belongs to Poorest income Quintile[d]	Share of Stunted Children[e]	Share of Wasted Children[e]	BMI of the Women[f]
Liaoning	0.000	0.000	0.048	0.120	0.060	0.281	0.521	0.036	0.006	0.000	0.036
Heilongjiang	0.134	0.000	0.287	0.152	0.128	0.713	0.665	0.122	0.018	0.000	0.067
Jiangsu	0.063	0.013	0.114	0.063	0.196	0.165	0.570	0.063	0.000	0.000	0.057
Shandong	0.225	0.013	0.388	0.238	0.269	0.313	0.550	0.069	0.006	0.006	0.031
Henan	0.264	0.006	0.396	0.094	0.176	0.327	0.522	0.170	0.019	0.000	0.050
Hubei	0.173	0.000	0.333	0.109	0.263	0.481	0.782	0.115	0.006	0.000	0.032
Hunan	0.054	0.006	0.090	0.072	0.199	0.675	0.789	0.127	0.006	0.000	0.096
Guangxi	0.201	0.006	0.250	0.104	0.244	0.488	0.750	0.207	0.000	0.000	0.073
Guizhou	0.158	0.006	0.521	0.103	0.273	0.915	0.897	0.200	0.030	0.000	0.055
C.V.[g]	**0.666**	**0.962**	**0.577**	**0.464**	**0.371**	**0.451**	**0.182**	**0.502**	**0.934**	**2.828**	**0.413**
All China	**0.141**	**0.005**	**0.269**	**0.106**	**0.200**	**0.487**	**0.672**	**0.123**	**0.010**	**0.001**	**0.056**

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

g. Coefficient of Variation

Table 16: Percentage Contribution of Deprivation Dimensions in India

	Rural India						Urban India					
	α = 1			α = 5			α = 1			α = 5		
Dimensions	**NFHS 1**	**NFHS 2**	**NFHS 3**	**NFHS 1**	**NFHS 2**	**NFHS 3**	**NFHS 1**	**NFHS 2**	**NFHS 3**	**NFHS 1**	**NFHS 2**	**NFHS 3**
Drinking Water	13.52	14.31	17.70	10.41	14.84	35.55	14.87	17.36	20.49	10.87	15.67	20.10
Electricity for Lighting	10.64	9.51	7.44	3.14	1.92	0.47	6.61	3.79	2.61	0.19	0.01	0.00
Clean Fuel for Cooking[a]	18.22	18.03	18.14	46.35	47.06	40.09	17.32	12.71	11.56	23.33	3.29	1.15
Access to Toilet[b]	16.13	15.37	13.48	25.17	21.19	9.08	10.13	7.81	5.17	1.59	0.29	0.02
Education of the Household[c]	9.69	8.60	8.73	1.97	1.16	1.04	9.73	8.63	8.86	1.30	0.48	0.30
Access to Bicycle	11.87	10.86	9.68	5.44	3.74	1.73	19.56	19.93	17.02	42.89	31.30	7.95
Access to Radio	12.65	13.22	14.24	7.48	10.00	11.97	16.77	21.80	26.34	19.82	48.96	70.47
Falling to Poorest Wealth Quintile	4.45	5.04	4.93	0.04	0.08	0.06	0.58	1.06	1.00	0.00	0.00	0.00
Share of Stunted Children[d]	2.15	2.30	2.34	0.00	0.00	0.00	3.37	2.96	2.83	0.01	0.00	0.00
Share of Wasted Children[d]	0.68	0.75	0.84	0.00	0.00	0.00	1.07	1.08	1.25	0.00	0.00	0.00
BMI of the Mother[e]	N.A.	2.01	2.48	N.A.	0.00	0.00	N.A.	2.87	2.87	N.A.	0.00	0.00

a. Electricity, kerosene, liquefied petroleum gas (LPG) and bio gases are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including pit toilet at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

e. If the BMI of the mother of a household is less than 18.5 or more than 30, household is considered to be deprived.

Table 17: Percentage Contribution of Deprivation Dimensions in China

	Rural China						Urban China					
	α = 1			α = 5			α = 1			α = 5		
Dimensions	**CHNS 1993**	**CHNS 2000**	**CHNS 2006**	**CHNS 1993**	**CHNS 2000**	**CHNS 2006**	**CHNS 1993**	**CHNS 2000**	**CHNS 2006**	**CHNS 1993**	**CHNS 2000**	**CHNS 2006**
Drinking Water	20.64	20.33	16.63	15.36	18.35	5.70	16.13	11.97	6.79	7.14	2.04	0.03
Electricity for Lighting	0.66	0.78	0.37	0.00	0.00	0.00	0.22	1.29	0.26	0.00	0.00	0.00
Clean Fuel for Cooking[a]	28.50	25.42	20.43	76.99	56.00	15.98	26.12	18.99	12.98	79.54	20.52	0.84
Access to Toilet[b]	6.64	3.88	3.23	0.05	0.00	0.00	9.17	6.72	5.10	0.42	0.11	0.01
Education of the Household[c]	8.98	7.03	7.41	0.24	0.09	0.10	13.75	10.60	9.67	3.22	1.11	0.19
Access to Bicycle	6.22	10.37	14.15	0.04	0.63	2.55	9.90	17.14	23.52	0.62	12.30	16.39
Access to Radio	17.75	21.58	27.88	7.21	24.73	75.56	16.91	23.83	32.49	9.04	63.84	82.52
Falling to Lowest Income Quintile[d]	7.58	8.21	7.58	0.10	0.20	0.11	4.33	6.06	5.96	0.01	0.07	0.02
Share of Stunted Children[e]	1.01	0.63	0.50	0.00	0.00	0.00	0.82	0.59	0.50	0.00	0.00	0.00
Share of Wasted Children[e]	0.10	0.09	0.15	0.00	0.00	0.00	0.35	0.07	0.03	0.00	0.00	0.00
BMI of the Women[f]	1.93	1.69	1.67	0.00	0.00	0.00	2.29	2.73	2.68	0.00	0.00	0.00

a. Electricity, kerosene, liquefied natural gas and natural gas are classified as clean fuels and if a household does not generally use any of them for cooking, it is considered to be deprived.

b. If the household does not have any description of toilet facility including earth open pit at its own premises, it is considered to be deprived.

c. If the education of the head of the household is below primary, he is considered to be deprived.

d. Household per capita income at 2006 prices is taken to compute income quintile.

e. For share of stunted and wasted children in a household, the threshold for being deprived is 60 percent or more of the total children (in the age group of 0 to 3 years) in the household.

f. If the average BMI of the women, in the age group of 15- 49 years, in a household is less than 18.5 or more than 30, that household is considered to be deprived.

Table 18: Correlation in BMI of Mother/Women[b] and Stunted/ Wasted[c] Children

India[a]					China[a]				
	Correlation between BMI and Stunted Children		Correlation between BMI and Wasted Children			Correlation between BMI and Stunted Children		Correlation between BMI and Wasted Children	
	Rural	Urban	Rural	Urban		Rural	Urban	Rural	Urban
NFHS1 (1992-93)	N.A.	N.A.	N.A.	N.A.	CHNS 1993	-0.02 (0.06)	-0.07 (0.12)	-0.08 (0.06)	0.05 (0.12)
NFHS2 (1998-99)	-0.008 (0.010)	0.006 (0.018)	-0.036** (0.015)	0.018 (0.029)	CHNS 2000	-0.15* (0.08)	-0.19* (0.12)	-0.003 (0.08)	-0.14 (0.12)
NFHS3 (2005-06)	0.007 (0.009)	0.034*** (0.01)	-0.094*** (0.013)	-0.040** (0.019)	CHNS 2006	-0.08 (0.07)	0.12 (0.13)	-0.06 (0.38)	0.19 (0.13)

a. Figures in parenthesis are standard errors and '*', '**' and '***' denotes significance at 10%, 5% and1% respectively.
b. BMI is the BMI of the mother of a child (in the age group of 0-3 years) for India. For China, BMI is the average BMI of the women in the household in the age group of 15-49 years.
c. Stunted and wasted are defined as height for age and weight for height z score less than -2.

Table 19: Measures of Multi-dimensional[a] Deprivation in India and China

	Rural India		Urban India			Rural China		Urban China	
	π_1	π_5	π_1	π_5		π_1	π_5	π_1	π_5
NFHS1 (1992-93)	0.519	0.060	0.228	0.011	CHNS 1993	0.295	0.007	0.199	0.004
NFHS2 (1998-99)	0.457	0.063	0.184	0.008	CHNS 2000	0.261	0.006	0.170	0.002
NFHS3(2005-06)	0.443	0.056	0.199	0.008	CHNS 2006	0.277	0.006	0.188	0.002

a. The dimensions of deprivation included here are 11. The household is defined as deprived if it does not have access to drinking water on its own premises; access to electricity for lighting ; access to clean fuel for cooking (mainly LPG, kerosene, electricity and biogas) ; access to any description of toilet including pit latrine; education of the household head is below primary; access to cycle as a basic minimum transport; access to radio as a basic source of entertainment; falling in the poorest wealth quintile for India and income (per capita household income at 2006 prices) quintile for China; share of stunted children (in 0-3 years of age) in the household is 60% or more; share of wasted children (in 0-3 years of age) in the household is 60% or more; BMI of the mother for India and (average) BMI of women in the age group of 15-49 years for China in the household is less than 18.5 or above 30.

Table 20: Child Health Statistics (in percentages) in India and China

India[a]										China[a]						
	Stunted Rate[b]			Wasted Rate[b]			Anaemic Rate[c]				Stunted Rate[b]			Wasted Rate[b]		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total		Boys	Girls	Total	Boys	Girls	Total
NFHS 1(1992-93)	53.9%	49.1%	51.5%	23.7%	19.9%	21.8%	N.A.	N.A.	N.A.	**CHNS 1993**	32.5%	30.5%	31.5%	5.5%	3.3%	4.5%
NFHS2 (1998-99)	51.0%	49.4%	50.2%	19.7%	18.8%	19.2%	N.A.	N.A.	N.A.	**CHNS 2000**	24.6%	29.6%	26.7%	3.6%	5.1%	4.2%
NFHS 3(2005-06)	43.7%	40.9%	42.4%	21.3%	19.8%	20.6%	52.6%	50.8%	51.7%	**CHNS 2006**	24.7%	15.1%	20.6%	5.7%	5.0%	5.4%
1993-2006	49.4%	46.5%	48.1%	21.4%	19.4%	20.5%	N.A.	N.A.	N.A.	**1993-2006**	27.5%	25.3%	26.5%	5.0%	4.4%	4.7%

a. Information on child anaemic rates is not available for NFHS 1 and 2 for India. For China, CHNS data does not provide information on child anaemia.
b. Stunted and wasted are defined as height for age and weight for height z score less than -2 respectively.
c. If a child is suffering from mild or moderate or severe form anaemia, it is defined as anaemic. It has to be noted that haemoglobin levels below 7.0 gram in the blood per decilitre (g/dl) are considered as severe anaemia, levels between 7.1g/dl and 9.9 g/dl are considered as moderate anaemia and the cases between 10.0 g/dl and 10.9 g/dl are considered as mild anaemia.

Table 21: Determinants of Child Health in India (NFHS3): OLS Estimates[a]

Variables[b]	Height for Age Z Score[c]	Weight for Height Z Score[c]
Access to Amenities		
No_acc_drinkwater	-0.146***	-0.000847
	(0.0337)	(0.0275)
No_acc_electricity	-0.186***	-0.0489*
	(0.0364)	(0.0284)
No_acc_toilet	-0.204***	-0.123***
	(0.0348)	(0.0279)
No_acc_cycle	-0.136***	-0.0274
	(0.0264)	(0.0210)
No_acc_radio	-0.126***	-0.00492
	(0.0262)	(0.0210)
No_acc_fuel	-0.220***	-0.0850***
	(0.0368)	(0.0302)
Demographic /State Variables		
wealth_poorest	-0.130***	-0.0899***
	(0.0417)	(0.0317)
No Education of household head	-0.0993***	-0.0356*
	(0.0275)	(0.0214)
Per capita state income	-3.40e-05***	3.58e-05***
	(7.63e-06)	(5.92e-06)
State literacy rate	0.00963*	-0.00425
	(0.00515)	(0.00413)
Andhra Pradesh	0.203***	0.461***
	(0.0675)	(0.0524)
Assam	0.135	0.489***
	(0.0886)	(0.0690)
Jammu & Kashmir	0.642***	0.377***
	(0.0903)	(0.0703)
Karnatka	0.154**	0.290***
	(0.0784)	(0.0623)
Kerala	0.198	0.284**
	(0.175)	(0.139)
Madhya Pradesh	-0.0156	-0.0561
	(0.0673)	(0.0516)
Maharashtra	0.0368	0.139*
	(0.0897)	(0.0712)
Orissa	0.0860	0.481***
	(0.0878)	(0.0698)
Punjab	0.200***	0.114**
	(0.0720)	(0.0565)
Rajasthan	0.379***	0.254***
	(0.0723)	(0.0537)

Tamil Nadu	0.625***	0.0735
	(0.0879)	(0.0730)
Uttar Pradesh	-0.242***	0.525***
	(0.0563)	(0.0416)
West Bengal	0.397***	0.319***
	(0.0787)	(0.0639)
Hindu	0.160	0.00193
	(0.127)	(0.103)
Muslim	-0.0469	-0.0116
	(0.130)	(0.105)
Christian	0.118	0.0887
	(0.139)	(0.116)
Sikh	0.362**	0.347***
	(0.152)	(0.123)
Buddhist	0.248	-0.0454
	(0.186)	(0.152)
Jain	0.190	-0.0209
	(0.260)	(0.184)
sector_dum	0.342***	-0.0649
	(0.104)	(0.0839)
scst_dum	-0.204***	-0.0811***
	(0.0288)	(0.0225)
Health Variables		
Anaemic	-0.573***	-0.0571
	(0.0586)	(0.0449)
Low BMI of mother (<18.5)	-0.266***	-0.308***
	(0.0262)	(0.0205)
High BMI of mother (> 24.9)	0.128***	0.243***
	(0.0413)	(0.0336)
Female Autonomy		
Fem say: spend money	-0.0634*	-0.0145
	(0.0351)	(0.0273)
Fem say: large hhd purchase	2.71e-05	0.0330
	(0.0321)	(0.0250)
Fem say: daily hhd purchase	-0.0454	-0.0626**
	(0.0318)	(0.0246)
Fem say: Own health	0.00737	0.0338
	(0.0281)	(0.0222)
Fem earns more	-0.0461	0.104
	(0.0904)	(0.0713)
gender_dum	-0.156***	-0.0406**
	(0.0237)	(0.0187)
Constant	-1.481***	-0.968***
	(0.353)	(0.288)
Observations	**20,886**	**20,886**
R-squared	**0.076**	**0.065**

a. '*', '**' and '***' denote significance at 10%, 5% and1% respectively.
b. Variables are explained in appendix table A2.
c. Figures in parenthesis are robust standard errors.

Table 22: Determinants of Child Health in China (CHNS[a]): OLS Estimates[b]

Variables[c]	Height for Age Z Score[d]	Weight for Height Z Score[d]
Access to Amenities		
No acc drinkwater	-0.864***	0.202
	(0.281)	(0.199)
No acc electricity	-0.154	-0.556
	(0.326)	(0.474)
No acc toilet	0.446*	-0.598***
	(0.268)	(0.203)
No acc cycle	0.295	-0.444
	(0.292)	(0.562)
No acc radio	0.324	-0.101
	(0.214)	(0.197)
No acc fuel	0.0499	-0.0787
	(0.316)	(0.336)
Demographic/ State Variables		
wealth poorest	-0.103	-0.0401
	(0.204)	(0.211)
No Education of household head	0.183	0.0702
	(0.202)	(0.264)
Per capita state income	-6.87e-05	-1.09e-05
	(0.000273)	(0.000187)
State literacy rate	0.0698	-0.0153
	(0.0675)	(0.0618)
Heilongjiang	0.315	-0.192
	(1.663)	(0.611)
Jiangsu	0.908	-0.383
	(0.946)	(1.090)
Shandong	1.279	0.472
	(0.803)	(1.357)
Henan	0.412	-0.0280
	(0.970)	(1.256)
Hubei	-0.231	-0.124
	(1.105)	(0.987)
Hunan	-0.555	0.700
	(0.958)	(1.141)
Guangxi	0.444	-1.154
	(0.749)	(1.399)
sector dum	0.289	-0.507
	(0.226)	(0.395)
time chns2	-0.259	0.486
	(0.499)	(0.714)
time chns3	0.0178	1.318
	(1.117)	(1.122)
Health Variables		
Low BMI of Women(<18.5)	-0.221	-0.233
	(0.253)	(0.393)
High BMI of Women(> 24.9)	0.254	-0.301
	(0.336)	(0.292)
gender dum	-0.350*	0.0405
	(0.201)	(0.243)
Constant	-5.930*	2.565

	(3.507)	(5.761)
Observations	**884**	**877**
R-squared	**0.065**	**0.054**

a. CHNS rounds of 1993, 2000 and 2006 are pooled to increase the number of observations.
b. '*', '**' and '***' denote significance at 10%, 5% and1% respectively.
c. Variables are explained in appendix table A2.
d. Figures in parenthesis are robust standard errors.

Table 23: Multinomial Logit Estimates[a] of Categories[b] of Stunting in India (NFHS 3) and China (CHNS[c])

	India[e]						China[e]					
Variables[d]				**Marginal Effects**						**Marginal Effects**		
	Extreme Stunting	**Stunting**	**Healthy**	**Extreme Stunting**	**Stunting**	**Healthy**	**Extreme Stunting**	**Stunting**	**Healthy**	**Extreme Stunting**	**Stunting**	**Healthy**
Access to Amenities												
No_acc_drinkwater	0.260***	0.120**	-0.114	0.035***	0.011	-0.005*	0.402*	0.023	-0.444*	0.051*	0.001	-0.042**
	(0.059)	(0.052)	(0.112)	(0.009)	(0.009)	(0.003)	(0.243)	(0.234)	(0.254)	(0.027)	(0.023)	(0.020)
No_acc_electricity	0.348***	0.159***	0.049	0.045***	0.013	-0.002	-0.911	-0.104	-1.009	-0.091	0.014	-0.071
	(0.054)	(0.053)	(0.130)	(0.008)	(0.009)	(0.004)	(1.098)	(0.742)	(0.969)	(0.124)	(0.075)	(0.080)
No_acc_toilet	0.343***	0.196***	-0.034	0.044***	0.020**	-0.004	-0.626*	-0.491	0.522*	-0.071*	-0.046	0.056**
	(0.056)	(0.052)	(0.121)	(0.008)	(0.009)	(0.003)	(0.351)	(0.346)	(0.285)	(0.039)	(0.034)	(0.023)
No_acc_cycle	0.270***	0.046	0.148*	0.038***	-0.004	0.002	-0.175	-0.181	-0.052	-0.017	-0.015	-0.000
	(0.042)	(0.040)	(0.089)	(0.006)	(0.007)	(0.002)	(0.291)	(0.280)	(0.326)	(0.033)	(0.027)	(0.026)
No_acc_radio	0.190***	0.129***	-0.104	0.024***	0.015**	-0.005**	-0.247	0.163	0.173	-0.033	0.018	0.016
	(0.044)	(0.040)	(0.087)	(0.006)	(0.007)	(0.002)	(0.221)	(0.234)	(0.244)	(0.025)	(0.023)	(0.020)
No_acc_fuel	0.347***	0.205***	-0.146	0.044***	0.022**	-0.007**	0.303	0.170	0.159	0.030	0.011	0.008
	(0.065)	(0.057)	(0.122)	(0.009)	(0.010)	(0.003)	(0.271)	(0.291)	(0.252)	(0.030)	(0.029)	(0.020)
Health Variables												
Low BMI of	0.294***	0.223***	-0.148	0.036***	0.028***	-0.01***	0.053	0.077	0.144	0.003	0.006	0.010
Mother/Women(<18.5)	(0.040)	(0.039)	(0.097)	(0.006)	(0.006)	(0.003)	(0.371)	(0.385)	(0.421)	(0.041)	(0.038)	(0.034)
High BMI of Mother/	-0.212***	-0.117*	0.172	-0.028**	-0.013	0.007*	-0.312	0.045	0.179	-0.039	0.007	0.018
Women(> 24.9)	(0.078)	(0.066)	(0.126)	(0.012)	(0.011)	(0.004)	(0.275)	(0.265)	(0.223)	(0.031)	(0.026)	(0.018)
Anaemic	0.750***	0.351***	-0.79**	0.102***	0.036**	-0.03***	N.A	N.A	N.A	N.A	N.A	N.A
	(0.085)	(0.091)	(0.341)	(0.012)	(0.015)	(0.009)						
gender_dum	0.257***	0.036	-0.044	0.037***	-0.004	-0.003	0.524**	-0.090	-0.052	0.062***	-0.017	-0.010
	(0.038)	(0.035)	(0.082)	(0.005)	(0.006)	(0.002)	(0.207)	(0.209)	(0.203)	(0.023)	(0.021)	(0.016)

a. '*', '**' and '***' denotes significance at 10%, 5% and1% respectively.
b. Extreme stunting: height for age z score < -3; stunting: -3< height for age z score < -2; healthy: height for age z score > 2. Normal (-2 < Height for Age Z score < 2) Category is taken as base outcome.
c. CHNS rounds of 1993, 2000 and 2006 are pooled to increase the number of observations.
d. Variables are explained in appendix table A2. We have reported here only the coefficients and marginal effects of deprivation indicators and health variables for India and China due to space constraints, the coefficients on other variables (as explained in Table A2) are available on request.
e. Figures in parenthesis are robust standard errors.

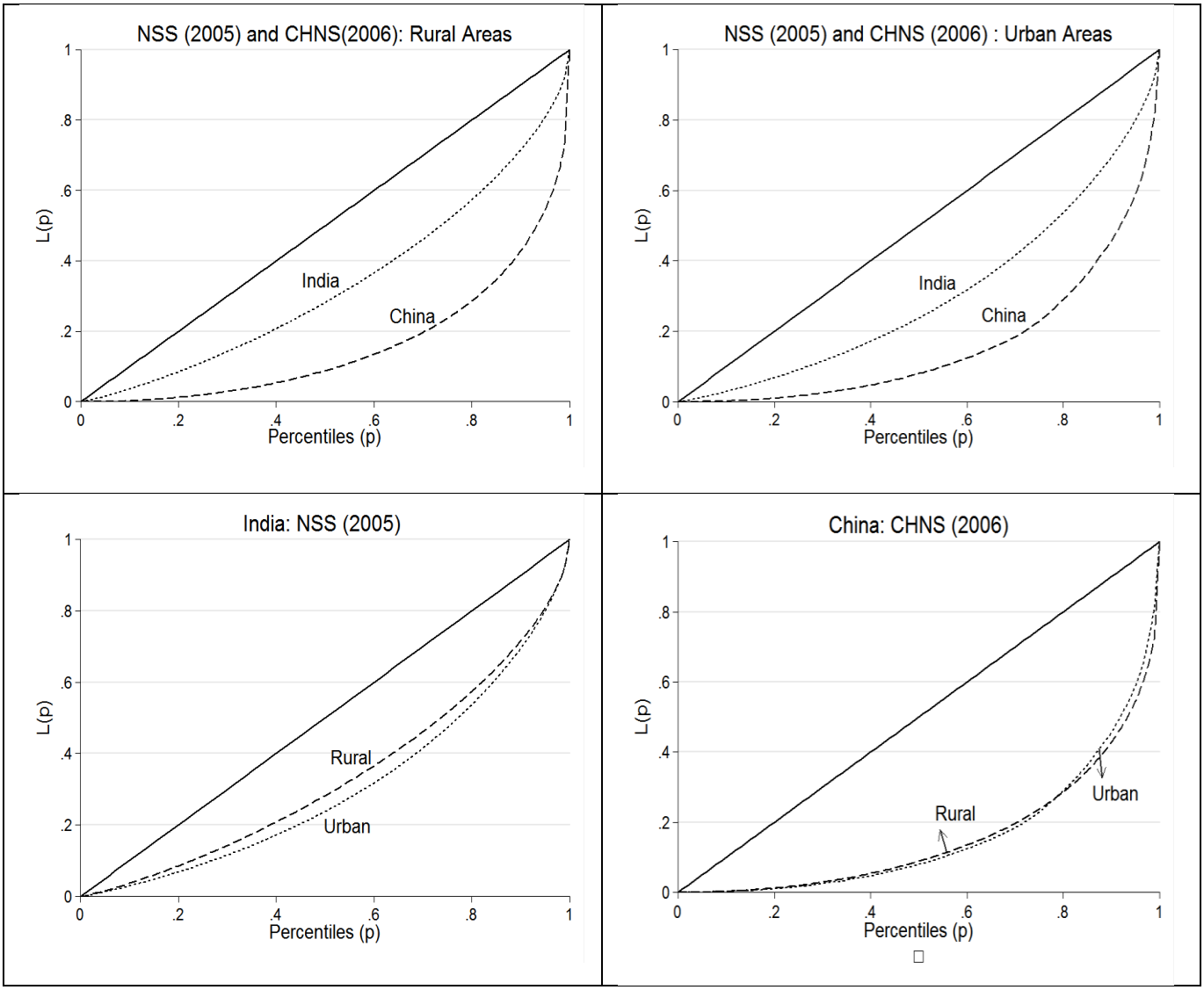
Table 24: Multinomial Logit Estimates[a] of Categories[b] of Wasting in India (NFHS 3) and China (CHNS[c])

	India[e]						China[e]					
Variables[d]				**Marginal Effects**						**Marginal Effects**		
	Extreme Wasting	**Wasting**	**Obese**	**Extreme Wasting**	**Wasting**	**Obese**	**Extreme Wasting**	**Wasting**	**Obese**	**Extreme Wasting**	**Wasting**	**Obese**
Access to Amenities												
No_acc_drinkwater	0.109	-0.101	0.072	0.008	-0.012*	0.001	-0.914*	0.413	-0.062	-0.000*	0.008	-0.014
	(0.084)	(0.064)	(0.135)	(0.005)	(0.007)	(0.002)	(0.520)	(0.463)	(0.191)	(0.000)	(0.009)	(0.035)
No_acc_electricity	0.087	0.031	0.033	0.005	0.003	0.000	-31.1***	1.975**	-0.558	-0.00***	0.041**	-0.114
	(0.078)	(0.062)	(0.162)	(0.005)	(0.007)	(0.003)	(0.865)	(0.976)	(0.625)	(0.000)	(0.018)	(0.116)
No_acc_toilet	0.163**	0.359***	-0.327**	0.008	0.039***	-0.006**	0.508	1.037*	-0.005	0.000	0.020*	-0.006
	(0.082)	(0.063)	(0.151)	(0.005)	(0.007)	(0.002)	(0.653)	(0.530)	(0.236)	(0.000)	(0.010)	(0.044)
No_acc_cycle	0.200***	0.088*	0.249**	0.012***	0.007	0.004**	-0.045	-0.626	0.075	-0.000	-0.013	0.017
	(0.060)	(0.046)	(0.108)	(0.004)	(0.005)	(0.002)	(0.803)	(0.604)	(0.236)	(0.000)	(0.012)	(0.044)
No_acc_radio	0.057	-0.031	0.131	0.004	-0.004	0.002	-0.137	0.360	-0.114	-0.000	0.008	-0.023
	(0.063)	(0.049)	(0.114)	(0.004)	(0.005)	(0.002)	(0.590)	(0.430)	(0.178)	(0.000)	(0.009)	(0.033)
No_acc_fuel	0.039	-0.044	-0.108	0.003	-0.005	-0.002	0.457	0.428	0.074	0.000	0.008	0.012
	(0.091)	(0.070)	(0.152)	(0.006)	(0.008)	(0.002)	(0.650)	(0.474)	(0.199)	(0.000)	(0.009)	(0.037)
Health Variables												
Low BMI of Mother/Women(<18.5)	0.351***	0.418***	-0.193	0.019***	0.043***	-0.004**	-0.590	0.855	-0.001	-0.000	0.017	-0.005
	(0.057)	(0.044)	(0.123)	(0.004)	(0.005)	(0.002)	(1.142)	(0.575)	(0.337)	(0.000)	(0.011)	(0.063)
High BMI of Mother/ Women(> 24.9)	-0.469***	-0.305***	0.292**	-0.027***	-0.030***	0.006**	-0.821	0.110	0.146	-0.000	0.001	0.027
	(0.128)	(0.091)	(0.146)	(0.008)	(0.010)	(0.002)	(0.805)	(0.554)	(0.181)	(0.000)	(0.011)	(0.034)
Anaemic	-0.053	0.132	-0.451	-0.004	0.016	-0.007	N.A	N.A	N.A	N.A	N.A	N.A
	(0.137)	(0.100)	(0.327)	(0.009)	(0.011)	(0.005)						
gender_dum	0.178***	0.083**	0.226**	0.010***	0.007	0.003**	0.204	0.109	-0.017	0.000	0.002	-0.004
	(0.055)	(0.042)	(0.103)	(0.003)	(0.005)	(0.002)	(0.557)	(0.425)	(0.157)	(0.000)	(0.008)	(0.029)

a. '*', '**' and '***' denotes significance at 10%, 5% and1% respectively.
b. Extreme wasting: weight for height z score < -3; wasting: -3< weight for height z score < -2; obese: weight for height z score > 2. Normal (-2 < weight for height z score < 2) Category is taken as base outcome.
c. CHNS rounds of 1993, 2000 and 2006 are pooled to increase the number of observations.
d. Variables are explained in appendix table A2. We have reported here only the coefficients and marginal effects of deprivation indicators and health variables for India and China due to space constraints, the coefficients on other variables (as explained in Table A2) are available on request
e. Figures in parenthesis are robust standard errors.

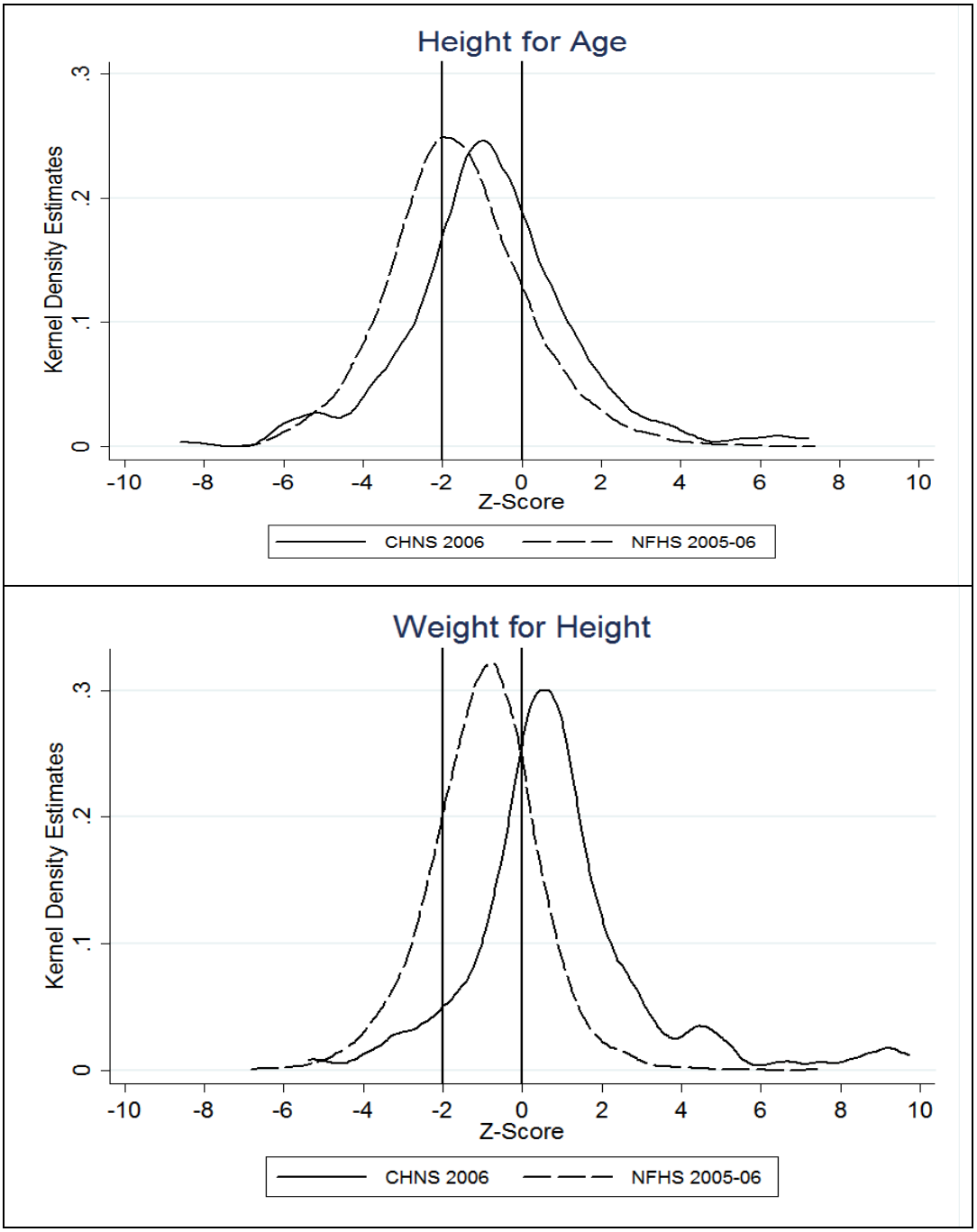
Figures

Figure 1: Lorenz Curves: Monthly per Capita Expenditure[a]



a. Monthly per capita expenditure at constant prices, for India prices prevailing (Consumer Price Index for Agriculture Labourers for rural areas and Consumer Price Index for Industrial Workers for urban areas) in 61st round and for China, prices prevailing in 2006 are used as base.

Figure 2: Kernel Density Graphs – India vs. China



Appendix

Table A1: Exchange Rates and PPP conversion Rates[a] as used for CHNS and NSS

China			India		
	Exchange rate (Yuan/US $)	PPP conversion rate		Exchange rate (Rs./US $)	PPP conversion rate
1993	5.78	2.52	1994	31.39	10.31
2000	8.28	3.29	2000	45.00	13.63
2006	7.97	3.46	2005	44.00	14.67

a. US $ exchange rates and PPP rates are sourced from Federal Reserve Bank of New-York annual statistical releases and World Economic Outlook Database (Oct, 2009) respectively.

Table A2: Explanation of Regression Analysis Variables

Explanation of Regression Analysis Variables: India	
Access to Amenities	
No_acc_drinkwater	1 if no access to drinking water on premises; 0 otherwise
No_acc_electricity	1 if no access to electricity for lighting on premises; 0 otherwise
No_acc_toilet	1 if no access to any description of toilet on premises including pit toilet; 0 otherwise
No_acc_cycle	1 if no member of the household owns bicycle; 0 otherwise
No_acc_radio	1 if no member of the household owns radio; 0 otherwise
No_acc_fuel	1 if no access to clean fuel for cooking (like kerosene, electricity, LPG, biogas); 0 otherwise
Demographic/State variables	
wealth_poorest	1 if household falls to the poorest wealth quintile, 0 otherwise
No Education of household head	1 if education of the head of household is below primary; 0 otherwise
Per capita state income	State-wise per capita income at 1993-94 prices (in Rs)
State literacy rate	State- wise literacy rates based on 2001 census
Andhra Pradesh	1 if state is Andhra Pradesh; 0 otherwise
Assam	1 if state is Assam; 0 otherwise
Jammu & Kashmir	1 if state is Jammu & Kashmir; 0 otherwise
Karnataka	1 if state is Karnataka; 0 otherwise
Kerala	1 if state is Kerala; 0 otherwise
Madhya Pradesh	1 if state is Madhya Pradesh; 0 otherwise
Maharashtra	1 if state is Maharashtra; 0 otherwise
Orissa	1 if state is Orissa; 0 otherwise
Punjab	1 if state is Punjab; 0 otherwise
Rajasthan	1 if state is Rajasthan; 0 otherwise
Tamil Nadu	1 if state is Tamil Nadu; 0 otherwise
Uttar Pradesh	1 if state is Uttar Pradesh; 0 otherwise
West Bengal	1 if state is West Bengal; 0 otherwise
Hindu	1 if religion of the head of household is Hindu; 0 otherwise
Muslim	1 if religion of the head of household is Muslim; 0 otherwise
Christian	1 if religion of the head of household is Christian; 0 otherwise
Sikh	1 if religion of the head of household is Sikh; 0 otherwise
Buddhist	1 if religion of the head of household is Buddhist; 0 otherwise
Jain	1 if religion of the head of household is Jain; 0 otherwise
sector_dum	1 if household belongs to rural areas; 0 if urban areas
scst_dum	1 if head of household head belongs to SC/ST social group; 0 otherwise
Health Variables	
Anaemic	1 if child is severe, moderate and mild anaemic; 0 if not anaemic
Low BMI of mother (<18.5)	1 if BMI of the mother is less than 18.5 (underweight);0 otherwise
High BMI of mother (> 24.9)	1 if BMI of the mother is more than 24.9 (overweight or obese); 0 otherwise
Female Autonomy	
Fem say: spend money	1 if female has say in spending money; 0 if she has no say
Fem say: large hhd purchase	1 if female has say in large household purchases;0 if she has no say
Fem say: daily hhd purchase	1 if female has say in daily household purchases;0 if she has no say
Fem say: Own health	1 if female has say in own health care decisions;0 if she has no say
Fem earns more	1 if female earns more than husband;0 if she earns less
gender_dum	1 if child is male; 0 if female
Explanation of Regression Analysis Variables: China	
Access to Amenities	
No_acc_drinkwater	Same as India
No_acc_electricity	Same as India
No_acc_toilet	1 if no access to any description of toilet on premises including earth open pit; 0 otherwise
No_acc_cycle	Same as India
No_acc_radio	1 if no member of the household owns radio/tape recorder; 0 otherwise
No_acc_fuel	1 if no access to clean fuel for cooking (such as kerosene, electricity,

	liquefied natural gas,); 0 otherwise
Demographic / State variables	
wealth_poorest	1 if household falls to the lowest 20% income quintile (computed on per capita income of a household at 2006 prices); 0 otherwise
No Education of household head	1 if education of the head of household is below primary; 0 otherwise
Per capita state income	Mean income (per capita at 2006 prices) of households province wise (from CHNS surveys)
State literacy rate	Ratio of no. of households with education of the household head primary or above and total no. of households province wise (from CHNS surveys)
Heilongjiang	1 if province is Heilongjiang; 0 otherwise
Jiangsu	1 if province is Jiangsu; 0 otherwise
Shandong	1 if province is Shandong; 0 otherwise
Henan	1 if province is Henan; 0 otherwise
Hubei	1 if province is Hubei; 0 otherwise
Hunan	1 if province is Hunan; 0 otherwise
Guangxi	1 if province is Guangxi; 0 otherwise
sector_dum	Same as India
time_chns2	1 if CHNS survey year is 2000; 0 otherwise
time_chns3	1 if CHNS survey year is 2006; 0 otherwise
Low BMI of Women(<18.5)	1 if average BMI of the women in a household (in the age group of 15-49 years) is less than 18.5 (underweight)
High BMI of Women(> 24.9)	1 if average BMI of the women in a household (in the age group of 15-49 years) is more than 24.9 (overweight or obese)
gender_dum	Same as India