Counting Undernourished Children

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The report of the Hunger and Malnutrition Survey, which was conducted between October 2010 and February 2011 to assess the rate of under-nutrition among children under the age of five in 100 focus districts of rural India, makes progress in measuring under-nutrition at the district level in some of the states. It also presents the important finding that there has been an overall reduction in underweight rates.

The Hungama (Hunger and Malnutrition) Survey was conducted across 112 rural districts of India in 2011 to provide a “granular” assessment of the rate of under-nutrition among 0-5-year old children in 100 focus districts. The two components of the survey’s title – hunger and malnutrition – seem inappropriate at first glance given how these terms are commonly understood. The survey’s report does not capture food adequacy or its affordability in a quantitative or qualitative sense, which would have constituted an assessment of hunger. Malnutrition is inadequate or unbalanced nutrition, representing either under- or over-nutrition, but only undernutrition is the concern of the report. Besides, the report’s focus is only on children less than five years old. Having said this, the hunger dimension is addressed by measuring underweight, stunting and wasting rates among children because these indirectly reflect inadequate access and lack of affordability of a balanced diet. Further, in the case of small children, most scholars and international agencies do not usually make a distinction between malnutrition and undernutrition. So, on second thoughts, the title of the report does seem justified.

The survey also aimed to capture the effect of mothers’ knowledge of good practices of early childcare levels of hygiene prevailing in village households and the quality of services available in villages that would aid maintaining good nutrition and health among children. The report organises the findings of the survey in four sections, three of them being nutrition status of children, mothers’ voices and anganwadi services. There is a brief synthesis of the findings for each district and this forms the bulk of the report. The fourth section on demography and nutrition status analyses the variations in nutritional outcomes of children using regression models.

Focus of the Survey
The Hungama Survey, initiated by the Citizen’s Alliance against Malnutrition and coordinated by the Naandi Foundation, Hyderabad, was conducted in 3,360 villages across nine states between October 2010 and February 2011. The 100 focus districts (FD hereafter) were identified on the basis of low ranks in a child development district index developed for UNICEF India in 2009 and a brief note on this is provided in one of the appendices. That these districts are in Bihar, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh does not come as a surprise. Alongside these districts, the survey also covered
the best-performing districts in each of these states and two districts each in Himachal Pradesh, Kerala and Tamil Nadu for the purpose of comparison.

Appendix III of the report indicates that the survey was conducted in the 3,360 villages by trained investigators using a well-designed sampling framework. The estimates for under-nutrition rates at the district level were arrived at by using sampling inflation factors (sampling probability weights) and are therefore representative of the population covered. At the individual level, the survey measured height, weight and mid-upper arm circumference (MUAC) of 1.09 lakh children below the age of five, constituting about 20% of the children in the age group in 2011. At the household level, information on the childcare practices followed was provided by about 74,000 mothers and the basic socioeconomic features of each household, including sanitation and income status, were collected. At the village level, data on the services provided by anganwadis was gathered. The report says that “recording mother’s voices” was an important and distinctive feature of the survey. But it is probably the focus on the quality of anganwadi services and the perceptions of anganwadi workers that really sets it apart.

Summary of Findings
What follows is a summary of the survey’s findings.
• There are higher rates of stunting (58.8%) compared to underweight rates (42.3%), but far lower rates (of about 11%) for malnutrition assessed using weight for height measures (wasting rates) or MUAC.
• Undernourishment rates vary with age, increasing most sharply for stunting (but only up to the age of three and then a marginal but gradual decline) and moderately for underweight, while they decline for wasting. Female children tend to lose out on the initial advantage in nutritional status, but this varies with indicators.
• Lower nutritional outcomes for children exposed to unhygienic living conditions and among children in families with poor childcare practices, particularly in breastfeeding, in the early stages of infancy. This is seen more in low-income households with mothers who are less educated.
• There is a substantial gap between the FD and the best districts (BD hereafter) in the same state and a still larger gap with the districts in the better-performing states in some but not all indicators.
• Wasting rates are rather high in the BD, which also seem to increase with age, unlike in the FD.
• Village-level infrastructure facilities and services do not seem to significantly influence the variations in levels of undernourishment.
• All the households surveyed had soap, but did not use it effectively, even in the BD.
• About 94% of the mothers covered in the survey had not heard the word malnutrition in their local language, while 62% of these mothers indicated that they had the decision-making power regarding their child’s welfare.
• Many mothers in the FD did not prefer to use traditional methods for treating their children if they fell ill even though they followed traditional care practices, particularly in breastfeeding.
• Anganwadi centres are widespread and well used, primarily for immunisation, and to some extent, for food.
• Anganwadi workers (AWW) had similar levels of education (80% had studied at least up to the eighth grade) in all the districts.
• The perspective of the AWW on what would impinge upon the health of the children in their regions was not substantially different in many aspects in the BD and FD. For instance, breastfeeding soon after birth or timely and full immunisation had similar rates of high response, while washing hands with soap and more money to buy food had similar low rates of response. Gaps in knowledge were noted in aspects like beginning supplementary food at six months or supplementary vitamins, with lower rates of response in FD than in BD.

The first three sections of the report could have presented the results in an explanatory manner rather than just narrating what can be observed in the graphs and tables. For example, in the discussion on under-nutrition by age (p 21) one finds that stunting rates increase faster in the FD than the BD and under-weight rates increase slowly, while the wasting rate marginally declines. Further, after the age of three, stunting rates decline, but far less in the FD than in the BD. This gives a point of entry for intervention across age groups, but unfortunately one does not get any sense of how and why rates of change and their directions are different for various indicators and also across regions. Similarly, a more instructive presentation of the association between undernourishment rates and mother’s education would have been useful. Only small and gradual gains are made at lower levels of educational improvement – a 10 percentage point decline from the level of “no education” to grade (class) nine. Then comes a tipping point, a decline of about 7-8 percentage points to grade 10. The high base values give only a limited advantage to the children of better-educated mothers in the FD, with underweight rates at 27% and stunting rates at 43%, while it is 17% and 27% in the BD. Since the gaps are still high, it indicates that mother’s education plays a limited role.

Correlates and Interactions
The final section of the report uses an econometric approach to understand the variation in undernourishment rates in each of four different measures across the correlates of gender and age (individual level), caste and income (household level), and infrastructure (village level). These are referred to in the report as within household, between household and between village regressions. This section is a preliminary analysis carried out by two scholars, Abijit Banerjee and Ariel Zucker at the Massachusetts Institute of Technology, who do not seem to have been directly associated with the survey. The regression models are estimated separately for each undernutrition indicator using the z-score for that measure for each child. The multivariate regression models give the impact of the correlates of under-nutrition net of other correlates and also capture the interaction between different correlates. A statistically significant coefficient indicates a noteworthy effect and if negative (positive), shows an adverse (favourable)
The results point out that the scores are inadequate for children in all the states barring Orissa, with only one or two states showing this pattern for MAZ and WAZ. The model does not show this pattern except for WAZ in Kerala and one wonders why the dips are so large and do not consistently change with age.

More importantly, a careful look at the detailed results in the appendix table indicates that (for each of these indicators in the above-mentioned results), the coefficients refer to the low-income group as the age variable also interacts with income categories. Once again, one is not able to generalise on changes with age for different under-nutrition indicators as income improves because no clear pattern emerges with many coefficients being statistically insignificant. In spite of this limited understanding, there seems to be some linkages between income and age, which give scope for opportunities to intervene, but the findings do not make it possible to assess this.

Undernourishment and Gender

On the findings about the effect of gender and age, the report says, “As time goes on, nutritional outcomes for both boys and girls decline (the coefficients on age dummies for being 1-4 years old are negative)” (p 59). This blanket statement does not hold good in all cases. First, the age coefficients are consistently significant for MUAC z-scores (MAZ hereafter) and height for age z-scores (HAZ hereafter), but not for weight for age z-scores (WAZ hereafter). In the case of HAZ, the magnitude of the age coefficients first increase and then decrease. Only in the case of HAZ do we see these results in all the states barring Orissa, while only one or two states show this pattern for MAZ and WAZ. The model does not show this pattern except for WAZ in Kerala and one wonders why the dips are so large and do not consistently change with age.

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Undernourishment and Gender

The report’s executive summary states, “Girls seem to have a nutrition advantage over boys in the first months of life; however this advantage seems to be reversed over time as girls and boys grow older, potentially indicating feeding and care neglect vis-à-vis girls in infancy and early childhood” (p 9). Again, the statement does not find adequate support in the econometric results. This result finds support only in a few states in the case of stunting. Second, there is no clear reversal among girls with age for all the indicators of under-nutrition. It is observed only in underweight, rather than stunting, where the negative coefficients of the “age-female” interaction exceed the positive “female” coefficient in magnitude only after a certain age.

Further observations based on the econometric analysis are that even in the less developed regions of the country there seems to be a clear income effect on WAZ, more so than on HAZ in several states, which include Kerala but not Himachal Pradesh and Tamil Nadu. Despite controlling for income, caste is a dominant factor in determining nutrition outcomes for children but only in the focus states. The number of observations or sample size used in the estimations for different nutritional indicators varies for each given “type” of regression model. For instance, in within household estimations, the MAZ model

Economic Reforms and Growth in India

*Essays from the Economic and Political Weekly*

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This volume investigates the nature of economic growth in India, its pace over time, its relationship to changes in the policy regime and the role of the external sector, and uses data to evaluate the policies that have implicitly underpinned the changes. Presenting a range of approaches, views and conclusions, this collection comprises papers published in the Economic and Political Weekly between the late 1990s and 2008 that are marked by an empirical awareness necessary for an understanding of a growth history. The articles reflect a certain groundedness in their approach in that they privilege content/context over methodology. This volume is an important addition to the literature on post-liberalisation economic growth in India. It will be useful to students and scholars of economics and management.

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This series is being published as part of a University Grants Commission project to promote teaching and research in the social sciences in India. The project (2010-12) is being jointly executed by the Tata Institute of Social Sciences, Mumbai, and the Economic and Political Weekly. The series is meant to introduce university students and research scholars to important research that has been published in *EPW* in specific areas. The readers draw on the *EPWs* archive of published articles.

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uses about 89,400 observations, WAZ uses 96,300 and HAZ uses 93,300.7 Such differences in the number of observations across indicators seem a bit puzzling. This is also observed across states, wherein the difference in sample size between one indicator and another is sometimes as large as 9%. Nowhere in the report is there any mention of missing observations, as one would expect in a huge sample survey. Much is not to be gained either from state-level or best-state results as no generalisation seems possible, given the variation in the number of significant coefficients that is noted in the “all states” sample. The adjusted R-squares are sometimes higher in the 80 of the three best states when a substantial number of coefficients are statistically insignificant. Errors in reporting could have been avoided – the results in Table 6 (also in Table A14) are the same as in Table 5 (also in Table A15) for the best states.

Gains from the Survey

The HUNGAMA Survey fills the gaps with regard to some aspects compared to three other similar surveys, the 2005-06 National Family Health Survey (NFHS-3), the 2002-04 District Level Household and Facility Survey (DLHS-2) and the 2005 India Human Development Survey (IHDS).8 This is mainly in terms of it being more recent, collecting information on three relevant anthropometric measures along with some of their correlates and being representative at the level of the district for the FD. The report emphasises the “granularity” of the survey and also that it collected some more information than the DLHS-2, but does not capture the “what more do we know” aspect except through a tabular presentation of under-nutrition rates and its comparison with the DLHS-2 (pp 70-74) across districts. It could have presented the under-nutrition rates using maps of each of the states with their districts to provide a better understanding of the variations though not all the districts are covered in the six focus states. The table enables some quick observations.

1 The two districts in Kerala fare very well in all indicators of under-nutrition, but this is not true of the two districts each in Himachal Pradesh and Tamil Nadu.9

2 Underweight rates vary less and also change somewhat gradually when compared to stunting rates across districts. The rankings of districts do not appear to correlate well even with wasting rates and the MUAC indicator. If one were to use the best-state districts to understand the pattern, one sees that underweight rates are similar across the four Himachal Pradesh and Kerala districts at about 16% but that it is about 27% in both the Tamil Nadu districts. There is a lot more variation in stunting rates between the two districts of these states – 25% and 30% in Kerala; 35% and 40% in Himachal Pradesh; and 30% and 38% in Tamil Nadu.

3 The contrasts in district rankings are fairly sharp when indicators from HUNGAMA and under-five mortality rates (U5MR) for 2010-11 from the census (as reported in the table) are compared. There are several districts with lower levels of under-nutrition, but substantially high U5MR and vice versa. For instance, Madhepura in Bihar has a U5MR of 103 and a stunting rate of 53% and underweight rate of 40%, while Munger (best district in the state) has values of 68, 55% and 35%, respectively for these indicators. In Uttar Pradesh, Rae Bareli has a U5MR of 83 with 71% stunting rates (among the highest) and 41% underweight rates. In contrast, Mirzapur has a U5MR of 112 and a stunting rate of 47% but a similar rate for underweight. Compare this with Coimbatore in Tamil Nadu which has 91, 30% and 27% as the values for these three indicators respectively.

4 The districts of Uttar Pradesh do not fare well in many of the features, while the districts of Jharkhand have relatively lower rates and smaller variations across districts.

5 It is heartening that 86 of the 106 districts reported in the table show a decline in underweight rates between 2004 (DLHS-2) and 2010 (HUNGAMA) while the remaining record an increase. The magnitudes of the decline vary. As DLHS-2 values are reported using a different standard, the changes are not directly comparable.

6 (Finally, the “mother’s voices” and “anganwadi services” are presented as a district by district finding and drawing basic inferences across districts becomes rather cumbersome.

Conclusions

One could say that some inroads have been made in measuring under-nutrition rates at the district level in some of the states and an important finding is an overall reduction in underweight rates. The report highlights once again that different indicators are not strongly correlated and interventions may have to vary for reducing under-nutrition rates. Stunting clearly stands out as an indicator that requires a larger and sustained effort to tackle. No new insights seem to have come up on ways to intervene. The survey has captured information that leads to standard solutions such as improving income and parents’ education levels as well as access to health services and early care practices. There is no doubt that under-nutrition should continue to call for a lot of hungama; a bigger ruckus has to be created for a more focused and determined approach to bring down the high rates in the country.

NOTES

1 See www.wfp.org/hunger/glossary.
3 See www.naandi.org from where this report was downloaded and also www.hungamaforchange.org for more details.
4 Z-score normalises the indicator of nutritional status by subtracting each observed characteristic, that is, weight, height or MUAC from the reference median and then representing it as a ratio of the standard deviation. The mean and standard deviations are as per the standards provided by the World Health Organisation for each age group (also available by month). This normalisation is commonly followed as children naturally grow with age, but the shortfalls with the reference as a proportion of the standard deviation may vary from child to child and hence would capture the changes more effectively after accounting for increases.
5 This and the following discussion are based on within household regression results as the authors consider that to be the correct framework to capture age and gender effects.
6 This need not be the case for within household regressions as income or caste is the same within families.
7 It can be expected that some missing observations would be there and also the numbers would vary across “within” and “between” household models, and so on.
8 For NFHS-3, see www.nfhsindia.org; DLHS-2, see www.rchiips.org; IHDS, see http://ihds.umd.edu.
9 The reference districts are Hamirpur and Mandi in Himachal Pradesh; Pathanamthitta and Thiruvananthapuram in Kerala; Coimbatore and Kancheepuram in Tamil Nadu.
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