Is India's Child Malnutrition Caused by Hunger?

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India is in the process of setting up one of the most extensive food security program. The National Food Security Bill (FSB) that was signed into law on September 12, 2013, will provide 75 percent of rural and 50 percent of the urban population with five kg food grains per month at highly subsidized prices. This bill has emerged in response to extremely high levels of malnutrition. National Family Health Survey (NFHS) records that 48% of the Indian children are stunted and 43 percent are underweight. The bill will identify lowest income households in rural and urban India – lowest 75% in rural India and lowest 50% in urban India – to receive grain at Rs. 3 for wheat, Rs. 2 for rice and Rs. 1 for coarse cereals. FSB, expected to cover 67% of the Indian population, is an extremely expensive program. Its cost is estimated at 21 billion USD annually.

However, whether FSB succeeds in reducing child malnutrition depends on answers to a variety of questions:

1. What is the targeting efficiency of FSB and how well is it implemented?
2. Does FSB really lead to increased food consumption or do these subsidies simply reduce household expenditure on food without changing food intake?
3. Is hunger the primary determinant of child malnutrition? What is the contribution of hunger vis-à-vis food composition and disease climate in shaping child malnutrition?

Until FSB is fully implemented, it would be difficult to judge its impact. But examination of malnutrition in the context of existing public distribution system provides intriguing hints that suggest that the potential for FSB to improve child malnutrition in India may be more limited than we expect.

Public Distribution System (PDS) is a safety net program that provides basic items such as rice, wheat, sugar, and non-food items such as kerosene in rationed amounts at below-market prices. The program originated in the early period after Independence, when food shortages required large imports of food under the PL-

480 grants from the United States. A large network of PDS shops, also known as Fair Price Shops, was established: local traders were enrolled as owners, and households were issued a PDS card with monthly per capita entitlements of food staples. The programme continued with indigenous public resources even after the PL-480 programme ceased to exist when India's food production improved. The network of 4.76 lakh Fair Price Shops (FPS) now distributes cereals, kerosene and sugar to about 200 million families across all parts of India.

The PDS has changed both qualitatively and quantitatively since the 1970s. At first, the PDS was confined to urban areas and regions with food deficits. The main emphasis was on price stabilization. Private trade was considered "exploitative," and the PDS was considered a countervailing power to private trade. Since the early 1980s, the welfare role of the PDS has gained importance. Nevertheless, the PDS was widely criticised for its failure to reach those living below the poverty line for whom the programme was intended. Although rural areas were covered in many states in the 1980s, the PDS had an urban bias and large regional inequalities in its operation.

An effort was made, therefore, to streamline the PDS by introducing the Targeted Public Distribution System (TPDS) in June 1997. The objective was to help very poor families buy food grains at a reasonably low cost so that they would improve their nutrition standards and attain food security. The new system follows a two-tier subsidised pricing structure: one for below poverty line (BPL) families , and another for above poverty line (APL) families. The issue price of food grains for BPL families is fixed at 50% of the economic cost that the APL families pay, and all prices are revised by the Food Corporation of India (FCI) from time to time. The total food subsidy (including programmes other than PDS) has significantly increased in real terms over the years. In order to target the TPDS more towards the poor, the Antyodaya Anna Yojana (AAY) was launched in December 2000. This scheme sought to identify the 10 million poorest of the BPL families and provide them each with 25 kg of food grains per month at a fixed price of Rs. 2 per kg for wheat, and Rs. 3 per kg for rice.

Examining the effectiveness of PDS allows us to speculate about the potential effect of Food Security Bill. Using India Human Development Survey (IHDS) of 2004-5 we examine the nature of PDS system in India and its impact on child malnutrition.

India Human Development Survey

India Human Development Survey (IHDS) is a survey of 41554 households spread across 33 states and union territories of India. It only excludes islands of Andaman-Nicobar and Lakshadweep, thereby covering 99.5% of Indian population.

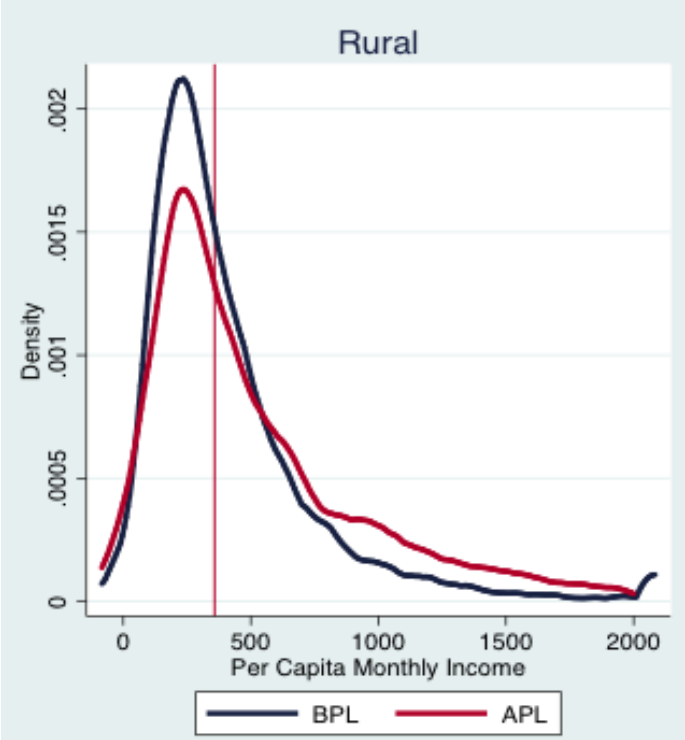
Its sample is spread across 1503 villages and 971 urban blocks and it seems to be highly reliable on a variety of parameters such as literacy, poverty and housing quality, where comparable statistics are available in Census or other national surveys (Desai, Dubey et al. 2010). It is uniquely suitable for this analysis because it is the only data source in India in which income, consumption expenditure, and anthropometry outcomes are available.

In this analysis, we first focus on availability and utilization of Public Distribution System (PDS) for all 41,554 households and then focus on weight-for-age for over 12,000 children under age 5 and relate it to access to BPL card.

What is the Targeting Efficiency of PDS?

Targeting in Targeted Public Distribution System (TPDS) is obtained through provision of Below Poverty Line (BPL) cards and Antyodaya card to the poorest of the BPL families. However, a variety of studies note that political corruption and elite capture results in many poor families being left out and a substantial number of non-poor gaining access to PDS cards. The IHDS data, depicted in the two graphs below also show substantial amount of leakage and corruption.

The blue line in the graph below shows income distribution of the households with Below Poverty Line (BPL) cards while the blue line shows income distribution for households with Above Poverty Line (APL) cards. The vertical line is drawn at the prevailing poverty line. These overlapping income distributions show substantial exclusion as well as leakage. Households who are counted as Above Poverty Line but actually have low income are excluded from the receipt of TPDS – this shows by area under red curve to the left of the poverty line, In contrast, households in possession of BPL cards but with high incomes – captured by the blue curve to the right of the poverty are indicative of the level of leakage in the TPDS system.


Rural
Density
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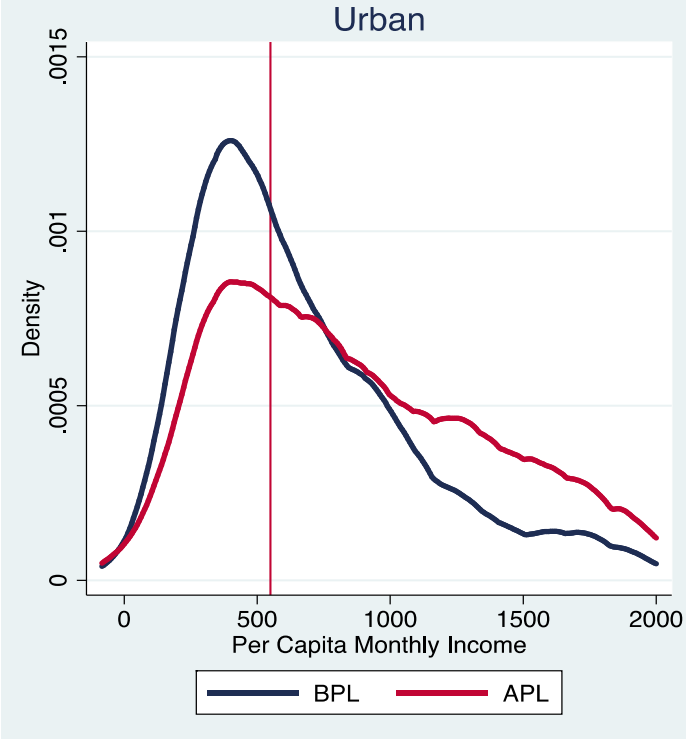
1500
2000
Per Capita Monthly Income
BPL
APL


Urban
Density
0
.0005
.001
.0015
0
500
1000
1500
2000
Per Capita Monthly Income
BPL
APL

This documentation of errors of commission and omission suggest that PDS may only have a limited role to play in allaying hunger for the neediest households, however, there is a possibility that substantial expansion of the program proposed by FSB may change the nature of exclusion, although not leakage.

Does Access to Subsidized Food Improve Food Consumption?

We would expect access to subsidized food to increase food consumption. Yet the IHDS data document that holding income constant, households with BPL card have only a minor edge in consumption of food grains. The IHDS asked about monthly consumption of rice, wheat, coarse cereals, cereal products and pulses. Dividing this total consumption of food grains by number of household members, we calculate per capita food grain consumption.

Table 1 shows per capita food grain consumption in Kg for different income categories by access to BPL card. The results show that on the whole, BPL card holders consume about 0.5 kg more of cereals and pulses per person per month. This is a relatively small advantage and largest among the lowest income quintile.

Table 1: Per Capita Monthly Food Grain Consumption (in Kg)		
Household Income Quintile	**No BPL Card**	**BPL Card**
Poorest	13.69	14.05
2nd Quintile	12.80	12.63
3rd Quintile	12.18	12.06
4th Quintile	11.55	11.82
Richest	11.23	11.06
All	**12.16**	**12.64**

Part of this weak relationship may be due to the fact that income does not seem to be strongly associated with higher cereal consumption – indeed at upper income levels, households seem have lower, rather than higher, cereal consumption. This has been noted by other researchers (Deaton and Drèze 2009) and may well be due to a shift away from cereal based diet towards a more diversified diet such as milk, vegetables and fruits.

In order to examine this, we look at overall food expenditure of BPL and non-BPL households at various income levels. If holding income constant, BPL households are able to buy cereals at a lower price and their consumption does not

go up significantly, they may be able to transfer these savings to buying other food items. Table 2 compares overall per capita expenditure on food for BPL and non-BPL households by income quintile. We see that at any given income level, BPL households seem to spend less on food than non-BPL households. So savings from cereal expenditure are not fully plowed back into a diversified food basket.

Table 2: Per Capita Monthly Expenditure on Food (In Rs.)		
Household Income Quintile	**No BPL Card**	**BPL Card**
Poorest	364	324
2nd Quintile	358	309
3rd Quintile	395	334
4th Quintile	447	377
Richest	587	461
All	**446**	**342**

These results suggest that access to BPL card may only have a limited impact on food intake. A number of reasons underlie this observation. Having access to a BPL card does not necessarily mean access to food grains. Distribution system is poorly structured with considerable leakage in food grains before they reach ultimate consumers. But even more importantly, food intake of Indian households may not be as inadequate as malnutrition statistics suggest. If households are able to get enough food, reduction in food prices via subsidized PDS may mean that households may transfer these savings to other purposes.

Does Access to Subsidized Cereals Reduce Child Underweight?

Even though our preliminary tabulations suggest that access to BPL card has very minor impact on cereal consumption, it may well be that this minor impact is enough to reduce malnutrition among children. Thus, we examine the relationship between access to BPL card and prevalence of malnutrition among children as measured by weight for age using WHO standards. Children who are 2 or more standard deviations below the reference population are classified as being underweight. Results are presented in Table 3.

Table 3: Proportion of Children Under 5 Underweight (Weight for age)		
Household Income Quintile	**No BPL Card**	**BPL Card**
Poorest	0.53	0.52
2nd Quintile	0.53	0.52
3rd Quintile	0.45	0.51
4th Quintile	0.38	0.45
Richest	0.29	0.32
All	0.44	0.48

These results are the most perplexing of those presented in this paper. Instead of being associated with lower malnutrition, holding income constant, access to BPL card is associated with higher levels of malnutrition, particularly among the highest two income quintiles.

It is possible that this is due to factors associated with possession of BPL card that have independent impact on child nutrition. These include caste and religion, state of residence and household structure.

We are in the process of exploring all of these relationships within multivariate analysis, including propensity score matching to ensure that we compare matched BPL and non-BPL households. The final paper will include results from these analysis.

Implications:

If our bivariate results stand the scrutiny of more sophisticated analyses, these results suggest grave cause for concern regarding the potential success of the Food Security Bill. Although the BPL program was carried out on a much smaller scale (about 38% households have BPL cards compared to 67% under proposed FSB), its success will depend on similar mechanisms for targeting households and distributing food grains.

These results also suggest that malnutrition in India may be less due to hunger and more due to other factors such as disease prevalence and dietary composition. These are not the factors the FSB is intended to address. Thus, we may well be using the wrong instrument to address child malnutrition.

References:

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