Access to Nutritious Meal Programmes
Evidence from 1999-2000 NSS Data

The 1999-2000 National Sample Survey data indicates that a large majority of children in India from poorer households did not have access to the meal schemes operational in the country. The only exception to this was Tamil Nadu where the schemes seemed to work the best in rural areas in the age group of seven to nine-year olds, without any discernible gender gap and was well targeted among the needy households. Further, among the poorer children, literacy rate and educational attainment were clearly higher when they had access to school meals perhaps implying that school enrolment and attendance improve in the presence of such schemes. This data however showed rather low coverage of Integrated Child Development Scheme among pre-school children across all states indicating problems of under-reporting or under-recording.

Children in India from the time of their birth to the age of 15 can have access to meals provided by institutions like balwadi and schools. Infant and pre-school children are to be covered under the Integrated Child Development Scheme (ICDS), which integrates food supplementation with health services (like immunisation and referral services) and non-formal pre-school education (for children aged three to six years). Regional variants of ICDS may also include services for expectant and lactating mothers and adolescent girls. Children between six and 15 years are supposed to have access to noon meals at school. If properly implemented, both these schemes have far-reaching impacts in terms of nutrition, health and education of the beneficiaries. The provision of supplementary feeding to infants and pre-school children arrests growth retardation and micronutrient related health problems at an early age. The positive externality of providing meals at school is twofold: (a) a marked increase in school attendance leading to fewer children either in labour force or the “nowhere” category and (b) a lifecycle impact in not only making the future adult population literate and healthy but also a more informed and healthier parent. Thus the two schemes together are a sequential build-up towards good health and improved future productivity but more importantly aim at minimising social biases favouring one or the other group. Considering the short-term and long-term benefits of such schemes, the approach paper to the 10th Plan (2002-2007) of the government of India (Gol, 2001) suggested making the ICDS universal while a Supreme Court ruling in 2001 ordered the enforcement of the National Programme of Nutritional Support to Primary Education (introduced in 1995), which is to implement the noon meal scheme across all the states in India.

These plans and rulings are yet to show their full impact and the evidence on their widespread effect is awaited. However, schemes like the ICDS are supposed to have been operational in many parts of India since 1973 while the noon meal scheme has been functional in some regions since the early 1980s. Several studies have evaluated such programmes and have found improper targeting or ineffectiveness in the delivery system, leading to far lower beneficial impacts of such schemes. While these studies are important contributions to the literature, most of them focus on the growth pattern of children within the control group, while very few studies compare the impact of programmes on children with those who are outside the programme; and even fewer studies exist that give a benefit cost ratio of such programmes. Moreover, the impact of such schemes on the cognitive development of children or the loss in productivity of an adult who was undernourished in childhood has not been adequately researched in India. Availability of such information will not only be helpful in convincing the planners and policy-makers to invest more in such schemes, but will also capture the attention of the media which could in turn induce increased participation by civil society and communities to monitor such schemes. All this would automatically help in enhancing the performance of these social schemes.

Given this background, the present paper uses a large survey of household consumption pattern to study the coverage of these two meal programmes across regions and socio-economic groups of India. The need for such an analysis arises from the fact that: (a) No such recent information on programme access is available at the regional level and (b) The National Sample Survey Organisation (NSSO) which collects the meal information publishes average meals taken by children in government institutions (in school or a balwadi) at the household level rather than on per child basis giving only partial information about the access rates. The present study attempts to fill these gaps by using the unit record data on meal intake by household members provided by the NSSO. The analysis presented here would be useful in understanding the geographic spread and the positive externalities associated with such schemes.

Database and Methodology

The NSSO in its quinquennial consumption surveys records information on meals taken from different sources – at home, at the employer’s residence, at school or similar institutions, by payment and in other ways – of each individual member within a household. This information is collected to adjust for meals taken by any household member outside and or given outside to non-household members so that a proper accounting
of the nutritional intake by households can take place. This data published in various reports on nutritional intake compiled by the NSSO, is classified only across monthly per capita expenditure (MPCE) classes for different states in India and excludes any other type of socio-economic classification.

One of the major problems with the estimate of the average meals taken in schools as presented in the NSSO reports is that the average is at the household level rather than for the population in the school-going age hence this gives only an idea of the distribution across MPCE classes as well as its geographic spread. The present study aims to rectify this by giving an estimate of average meals per month per child as well as access rates by children belonging to different age and socio-economic groups across boys and girls. This in turn gives an understanding about who the children accessing school meals are in order to document the spread of the scheme as well as its effectiveness in terms of targeting across the vulnerable socio-economic groups. As NSSO does not have information on either the health status or school attendance in the consumption schedule, the direct impact of these schemes on children seems rather difficult to obtain. However, the study attempts to present a small discussion comparing the health status and educational attainment of the children in the lower economic strata in a few select states including those states where a larger proportion of children have access to these schemes as opposed to those where the scheme is non-functional. This is based on the information on educational attainment of school children from the same database and anthropometric status of children in 0-3 years of age from the National Family Health Survey II [IIPS 2000; and henceforth referred as NFHS-2].

### Access Rates

**Total:** Table 1 indicates the number and proportion of children accessing meals from schools, ‘balwadi’, etc. Most states indicate fairly low numbers and access rates either in rural or urban areas. Tamil Nadu has the highest number of 400 lakh children accounting for 36 per cent of children belonging to rural areas. Following this, Kerala and Orissa also report significant numbers though accounting for much smaller proportion of the child population in the respective states. The access numbers and proportion are lower in urban than rural areas, but the state rankings remain the same irrespective of the rural or urban setting. In urban areas Himachal Pradesh, Kerala and Tamil Nadu show about 18 per cent, 14 per cent and 17 per cent access respectively. At the same time the northern states of Haryana, Jammu and Kashmir, Punjab, Rajasthan and Uttar Pradesh have far lower numbers of children reporting access. Besides the southern states, the western state of Gujarat seems to be faring somewhat better in the rural segment. Tamil Nadu which is the only state showing a fairly “large” number of children accessing meals in both rural and urban areas has had a history of providing meals in the primary and secondary levels of schooling and has had beneficial impacts of the integrated nutrition programme for the pre-school children [Viswanathan 2003].

**Across different age-groups:** A different picture emerges when the data on meals is further classified across age groups. The children are classified into the following age groups: (a) below one, (b) between one and six years, (c) between seven and nine, (d) boys between 13 and 15 years and (e) girls between 13 and 15 years.

### Table 2: Proportion of Poor Children Accessing Meals at School, etc., Rural and Urban

<table>
<thead>
<tr>
<th>State</th>
<th>Rural Accessing among Those Who Have Access</th>
<th>Urban Accessing among Those Who Have Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra Pradesh</td>
<td>2.3</td>
<td>65.3</td>
</tr>
<tr>
<td>Bihar</td>
<td>0.1</td>
<td>17.9</td>
</tr>
<tr>
<td>Gujarat</td>
<td>5.1</td>
<td>31.5</td>
</tr>
<tr>
<td>Haryana</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
<td>1.0</td>
<td>5.4</td>
</tr>
<tr>
<td>Jammu and Kashmir</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Karnataka</td>
<td>9.3</td>
<td>68.8</td>
</tr>
<tr>
<td>Kerala</td>
<td>17.7</td>
<td>35.3</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>56.7</td>
<td>84.7</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>49.5</td>
<td>37.4</td>
</tr>
<tr>
<td>Orissa</td>
<td>62.8</td>
<td>76.2</td>
</tr>
<tr>
<td>Punjab</td>
<td>29.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>33.0</td>
<td>49.5</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>26.2</td>
<td>49.5</td>
</tr>
<tr>
<td>Uttarakhand</td>
<td>0.1</td>
<td>28.7</td>
</tr>
<tr>
<td>West Bengal</td>
<td>69.6</td>
<td>45.8</td>
</tr>
</tbody>
</table>

### Table 1: Number and Proportion of Children (Below 15 Years) Reporting Access to Meals in Each Age Group across States

<table>
<thead>
<tr>
<th>State</th>
<th>Number of Children (Lakhs)</th>
<th>Rural Percentage of Children Age Groups</th>
<th>Urban Percentage of Children Age Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Children</td>
<td>All 1 2 3 4 5</td>
<td>All 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>25.7</td>
<td>1.4 0.0 0.9 1.8 2.1</td>
<td>1.7 0.7 1.2 0.0 2.3 0.8 0.2 2.3 0.6 0.8</td>
</tr>
<tr>
<td>Bihar</td>
<td>5.9</td>
<td>0.2 0.0 0.1 0.2 0.2</td>
<td>0.3 0.8 0.2 0.0 0.0 0.0 0.0 0.8 0.0 0.0</td>
</tr>
<tr>
<td>Gujarat</td>
<td>49.0</td>
<td>8.4 0.0 6.1 18.6 7.7</td>
<td>5.3 14.4 3.3 0.0 2.8 5.9 4.3 1.4 0.0 0.0</td>
</tr>
<tr>
<td>Haryana</td>
<td>0.47</td>
<td>0.1 0.0 0.2 0.0 0.0</td>
<td>0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
<td>3.69</td>
<td>2.1 0.0 2.7 3.9 1.4</td>
<td>1.2 0.25 17.9 0.0 4.4 13.1 23.8 36.0</td>
</tr>
<tr>
<td>Jammu and Kashmir</td>
<td>0.13</td>
<td>0.1 0.0 0.2 0.0 0.0</td>
<td>0.0 0.07 0.1 0.0 0.1 0.0 0.0 0.5 0.0 0.5</td>
</tr>
<tr>
<td>Karnataka</td>
<td>20.0</td>
<td>1.6 0.0 4.0 0.4 0.0</td>
<td>0.0 1.25 0.3 0.0 0.2 0.4 0.5 0.2 0.5 0.2</td>
</tr>
<tr>
<td>Kerala</td>
<td>95.5</td>
<td>16.4 0.6 10.8 32.2 16.9</td>
<td>16.9 26.1 13.5 0.0 9.0 24.6 15.2 13.5</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>94.2</td>
<td>3.8 0.0 2.4 6.7 4.9</td>
<td>3.8 1.85 0.3 0.0 0.4 0.2 0.3 0.2 0.0 0.0</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>50.5</td>
<td>2.5 0.1 4.1 2.1 2.3</td>
<td>0.7 6.9 0.6 0.0 0.6 0.4 1.3 0.2 0.0 0.0</td>
</tr>
<tr>
<td>Orissa</td>
<td>130.3</td>
<td>12.4 0.5 9.8 29.7 8.8</td>
<td>7.6 10.2 5.5 0.0 5.0 11.9 5.5 1.2</td>
</tr>
<tr>
<td>Punjab</td>
<td>0.72</td>
<td>0.1 0.0 0.2 0.0 0.2</td>
<td>0.0 0.01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>0.88</td>
<td>0.1 0.0 0.0 0.0 0.2</td>
<td>0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>412.2</td>
<td>35.7 1.4 27.3 58.9 38.0</td>
<td>33.6 93.6 16.8 0.0 11.8 29.1 16.6 19.2</td>
</tr>
<tr>
<td>Uttarakhand</td>
<td>10.6</td>
<td>0.2 0.1 0.1 0.3 0.2</td>
<td>0.2 2.13 0.2 0.3 0.1 0.0 0.0 0.6 0.0 0.0</td>
</tr>
<tr>
<td>West Bengal</td>
<td>13.6</td>
<td>0.6 0.0 0.8 1.0 0.4</td>
<td>0.2 1.12 0.3 0.0 0.3 0.4 0.2 0.2 0.2 0.2</td>
</tr>
</tbody>
</table>

*Note:* Age Groups: (1) Below one year (2) between 1 and 6 years, (3) between 7 and 12 years, (4) boys between 13 and 15 years and (5) girls between 13 and 15 years.
The rural ICDS schemes have been covered under the Tamil Nadu Integrated Nutrition Programme (TINP) which were funded partly by multilateral agencies for a fairly long period while the urban schemes have been partly financed by the state and partly by the centre [World Bank 1994 and Rajivan 2001]. These earlier studies suggest that TINP had good programme impacts with effective monitoring and, also allowed for flexibilities to suit the local needs and changes over time while it was being operationalised. A difference between the rural and urban operation has been that two anganwadi workers were employed in rural areas – one for the 0-three years of age and the other for the three-six year old children – as against one worker for all age groups in urban centres. Since the care and diet needs are different between these two age groups, a separate worker for each group seems to have improved effectiveness [Reddy et al 1992; NIN 2001].

This study finds a rather low coverage among the pre-school children covered under the ICDS scheme based on the NSS data. Firstly, the ICDS has a large health component and functions better than its feeding programme in many states and secondly as it caters to small children the feeding programme is in the morning in the form of a nutritious snack and is not operationalised. A difference between the rural and urban operation has been that two anganwadi workers were employed in rural areas – one for the 0-three years of age and the other for the three-six year old children – as against one worker for all age groups in urban centres. Since the care and diet needs are different between these two age groups, a separate worker for each group seems to have improved effectiveness [Reddy et al 1992; NIN 2001].

The children above six years are covered under the noon meal scheme programme within the school timings. Among these children most states show highest access by children in the age group of seven to 12 years with one exception of urban Himachal Pradesh (Table 1). In this region in the higher age group of 13 to 15 years the access rate is high and also interestingly more proportion of girls in this age group seem to be accessing the scheme than boys as noticed by the difference between age groups four and five. A further look at the data indicates some problem in recording the information and hence has not been included for further analysis.

Among poor: As for the school going children, one expects the targeting to be good due to self-selection. Schools providing noon meals are most likely government (municipal) schools or government aided schools. Though government regulations exist on the fee to be charged in primary schools the cost of schooling is usually higher in private schools thereby attracting children mainly from the upper economic strata. Moreover, in states like Tamil Nadu, books and uniforms are also provided free of cost in government schools along with meals and this works as an added incentive for the children from lower economic strata to attend these schools. Therefore, unlike a public distribution system where identification of the beneficiaries is more complicated and leakages are known to exist, a school feeding programme is expected to be more effective. However, a similar feature need not be observed in the ICDS programme, particularly in the age group of one-three years, as the child would have to be accompanied by an adult. If the parents are involved in manual labour the child may either accompany the parents to work or be left at home to be attended by another member (like an older sibling or an aged female member), resulting in irregular access by the child.

A worrisome finding is that in most states neither the ICDS nor the noon meal scheme is effectively functioning, resulting in the proportion of poor children accessing the scheme also to be very low as shown in Table 2. Expectedly Tamil Nadu is the only state that has the highest proportion among both rural and urban households accessing the scheme with the coverage among the poorer children being below 50 per cent. A reason for lower levels of coverage even among poorer school children could be that it is contingent upon the identification of a particular school as a “beneficiary school” by the state [Swaminathan et al 2004]. Consequently poor children in schools that are excluded, fail to benefit from such a scheme.

Given that rural poverty rate is higher than urban poverty rate in all the states and the proportion of undernourished children continue to be higher in rural than in urban areas as indicated in the second National Family Health Survey (NFHS-2) the demand for such schemes is higher in rural areas than in the urban. Consequently, the rural bias in coverage is rightly so (which is contrary to that observed in the public distribution system) and shows the effectiveness of the scheme to some extent. The possibility of a lower coverage of school age children in urban areas could be due to a bandwagon effect in schooling wherein many poor children may be attending private schools, and as mentioned above noon meal schemes are not likely to be operational in such schools. The issue of meal provision among school children has been emphasised mainly to improve educational attainment and its impact on health has had limited attention. This issue may be of importance among urban children as well, whose health status are far from those observed in many other countries with the problem of over nutrition among children also increasing at a rapid rate. Therefore the meal policy needs to be two-pronged with a meal programme at school for the needy children along with high importance to education about good nutritional practices in the school curriculum.

Among those who access: Among the children who have access to school meals, the proportion of poor is below 50 per cent in most states as shown in Table 2. Among states like Tamil Nadu and Kerala (where the schemes have an impact) the urban access rates among poor are higher than rural, which could be due to the fact that in rural areas the schemes are likely to be more widespread as most schools are government-owned where the possibility of the operation of schemes is higher. The inclusion of a significantly large proportion of non-poor children may also indicate that (a) either the quality of meal served is better therefore, the children from above poverty line households are also accessing the scheme or (b) that the poverty line approach to demarcate a household as poor or non-poor is narrow (as is used in this study) and that there are more needy children.
Exclusion of children from poorer households in urban or rural areas could either be due to their not attending the school or the scheme not being operational in the school where the children are enrolled. The limitations of the present data do not permit one to distinguish between these two aspects and consequently is unable to suggest appropriate remedial policy measures.

**Average Number of Meals**

A classification of the average number of meals per child per month taken by children below 15 years of age is reported in Table 3. Given that the access rates are low, the average meals are also low in majority of states in both rural and urban areas. Himachal Pradesh in urban indicates the highest number of about 16 meals while Tamil Nadu is next highest in rural with about eight meals but as mentioned earlier due to data problems Himachal Pradesh is not included in further discussion. The average meals would be about 18 in a month if at least one meal is provided in the school for about 25 working days in a month (including the Saturdays) but excluding the vacation period (of about three months in the entire year). The average number of meals in no state comes close to this number as indicated in the table. In better performing states there is a clear downward gradient in average meals taken at school across income quintiles in rural areas, reflecting efficiency due to self-targeting.

**Among those who access:** Though the access in many states is very low and expectedly, if the data is reclassified across those who are accessing the meals, the average numbers improve substantially as reported in Table 4. In rural Tamil Nadu the average meals are nearly the same across all age-groups with no gender bias while in most other states there does seem to be a gender bias in the age groups 13 to 15 years. The analysis in gender bias while in most other states there does seem to be a

average number of meals decline gradually across income quintiles, but by the fifth quintile there is a sharp decline for all the age groups in rural areas while in urban areas the decline is apparent between the first and the second quintile itself. An average number of meals of about 15 in the age group of 7-9 years for

<table>
<thead>
<tr>
<th>State</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra Pradesh</td>
<td>0.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Bihar</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Gujarat</td>
<td>1.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Haryana</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Jammu and Kashmir</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Karnataka</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Kerala</td>
<td>4.3</td>
<td>3.6</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Orissa</td>
<td>2.8</td>
<td>0.1</td>
</tr>
<tr>
<td>Punjab</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>10.2</td>
<td>7.7</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>West Bengal</td>
<td>0.2</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Notes: # The five income quintiles are formed by ranking the households on the basis of their monthly per capita expenditures with 20 per cent of population in each group. '1' refers to the poorest 20 per cent of the population and '5' refers to the richest 20 per cent of the population.
@ 'nr': Not reported.
quintile groups 1 and 2 in rural areas comes close to the average for 20 school days in a month. It is also worth noting that the average number of meals in urban schools are always lower than in the rural, while the gender bias in meals (though marginal) is lower in urban than in rural.

Further, in rural Tamil Nadu more children from vulnerable groups like the SC/ST as well as the agricultural labour households seem to be benefiting from the scheme as indicated by the higher number of average meals reported in Table 5b. Among the 7-9-year old children belonging to agricultural labour households, the average is about 17, while for the self-employed households it is about 11 meals. Further, children from socially backward households have higher average meals compared to the other households. A similar pattern is noted for other age groups as well, though the average number of meals is lower and with fewer girls in the 13-15-year age-group.

Meals at Home and Meals at School

Though the meals taken at home may not be directly necessary to study the coverage of school meals, they may highlight variations across economic groups and regional variations (which may be due to cultural differences as well). Along with the meals taken in school, if one takes a look at the meals taken at home across states, then the average number of meals per day per child is between two and three in a majority of states, clearly indicating no starvation levels in any state but there is considerable variation in average meals across states in India as reported in Table 6. For instance, in Kerala and Punjab the number of meals per child per month at home is high with similar numbers for rural and urban areas, while in states like West Bengal the urban averages are far lower than rural. Table 6 also reports the average number of meals per day per child is marginally Rajasthan Haryana, Punjab and Gujarat increases Kerala, Orissa, and Jammu & Kashmir, substantially Haryana, Karnataka, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, and Tamil Nadu. The number of meals across income quintiles also varies substantially across states and is used to classify them into the following typologies:

<table>
<thead>
<tr>
<th>Gradient of Average Meals across Income Quintiles</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases substantially</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerala, Orissa,</td>
<td>Jammu &amp; Kashmir,</td>
<td></td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>Kerala, Tamil Nadu</td>
<td></td>
</tr>
<tr>
<td>Decreases substantially</td>
<td>Andhra Pradesh,</td>
<td>Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Uttar Pradesh, West Bengal</td>
</tr>
<tr>
<td>Haryana, Karnataka</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increases marginally</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bihar, Himachal Pradesh, Pradesh, Maharashtra,</td>
<td>Bihar, Himachal Pradesh, Rajasthan</td>
<td></td>
</tr>
<tr>
<td>Jammu &amp; Kashmir, Pradesh, West Bengal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increases marginally</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gujarati, Punjab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rajasthan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreases marginally</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gujarati, Punjab</td>
<td>Haryana, Punjab and Gujarat</td>
<td></td>
</tr>
</tbody>
</table>

It must however be noted that among the states where the average number of meals either increases or decreases, the gradient is not gradual across income quintiles and the difference is apparent mainly between the richest and the poorest quintiles. Further in most states the average number of meals in rural areas is more than in the urban areas. The decline in number of meals across income quintiles or between rural and urban can perhaps be explained by the fact that the richer or urban (compared to rural) households are likely to eat out more by paying.

Table 6 also reports average meals across school meal access category (that is, with and without access). In all the states the average number of meals at home declines when the child has access to school meals. The individual (unit record) data in Tamil Nadu showed that the children who had access to meals in school reported 20 meals at school and 60 at home (per month) while for a child who did not access school meals, the meals at home are reported as 80 per month. Therefore the meals at school clearly seem to substitute for meals at home. If the school meal is of higher quality providing wholesome nutrition then it may still be worthwhile to provide the meals at school and the substitutability need not be a cause for worry. More importantly this means that during the winter and summer vacations, the households with children accessing school meals may be spending marginally more on food in order to provide for these members of family. It also suggests that meals provided at school would be better in terms of improving the nutritional status of children than take away dry rations as they would definitely be shared among other members of the household. A further implication of meal

<table>
<thead>
<tr>
<th>Table 5b: Average Number of Meals (Per Month Per Child) across Different Occupation and Social Groups in Rural Tamil Nadu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household’s Occupation</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>SENA</td>
</tr>
<tr>
<td>AGLAB</td>
</tr>
<tr>
<td>OTHLAB</td>
</tr>
<tr>
<td>SEAG</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Notes: (1) The occupation groups are: SENA: Self-Employed in Non-Agriculture, AGLAB: Agricultural Labour, OTHLAB: Other Labour, SEAG: Self-employed in Agriculture. (2) The social groups are: ST: Scheduled Tribe, SC: Scheduled Castes, OBC: Other Backward Castes.</td>
</tr>
</tbody>
</table>

Table 6: Average Number of Meals (Per Month Per Child) Taken at Home across School Meal Access Status and the Poorest and Richest Income Quintile: Rural and Urban

<table>
<thead>
<tr>
<th>Table 6: Average Number of Meals (Per Month Per Child) Taken at Home across School Meal Access Status and the Poorest and Richest Income Quintile: Rural and Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Meal Access</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
</tr>
<tr>
<td>Bihar</td>
</tr>
<tr>
<td>Gujarat</td>
</tr>
<tr>
<td>Haryana</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
</tr>
<tr>
<td>Jammu &amp; Kashmir</td>
</tr>
<tr>
<td>Karnataka</td>
</tr>
<tr>
<td>Kerala</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
</tr>
<tr>
<td>Maharashtra</td>
</tr>
<tr>
<td>Orissa</td>
</tr>
<tr>
<td>Punjab</td>
</tr>
<tr>
<td>Rajasthan</td>
</tr>
<tr>
<td>Tamil Nadu</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>West Bengal</td>
</tr>
</tbody>
</table>

Note: Income quintile ‘1’ refers to the poorest 20 per cent of the population and ‘5’ refers to the richest 20 per cent of the population as mentioned in Table 3.
provision at school is in reducing social biases that exist within the country thereby improving social equity.

**Health Status of Young Children across States**

It is beyond the scope of this study to assess the contribution of school meal programmes to improvement in health status, as the NSS data does not provide this information. However, one expects that in states where these schemes are well functioning, the average nutritional status of the children would be better than those regions where such schemes are not effective. Therefore it may be worthwhile probing a bit further to study this linkage based on a different data source. It should however be noted that even without the presence of such schemes, due to other reasons, the nutritional status of the children could be far better in states like Kerala or Punjab.

To some extent, the impact of the scheme in Tamil Nadu seems to be positive for children below three years as can be seen in the lower rate of undernourished children among the “low” standard of living households, as classified by NFHS-2. Among this group of households, Tamil Nadu has among the lowest percentage of 47.2, next only to Punjab with 46 per cent while Kerala shows the lowest rate of 35.8 per cent. All the other states show rates ranging between 50 per cent and 60 per cent. Similarly, immunisation rates of children (which forms a part of the ICDS scheme) in the “low” economic group are the highest at 86.1 per cent in Tamil Nadu while the all India figures are 30.4 per cent. Immunisation is also likely to be covered under certain public health programmes and may not be a part of ICDS alone. Hence, some studies have highlighted the better performance of Tamil Nadu particularly in immunisation and family welfare programmes due to a better public health delivery system for these programmes and hence may not necessarily indicate a better functioning ICDS [Kingdon et al 2004]. There may perhaps be some truth in this given that the immunisation rate in Tamil Nadu is 96.8 per cent in urban areas while in rural areas it is 84.6 per cent, much higher than the all India figures of 60.5 per cent and 30.6 per cent respectively. This may also imply that immunisation programmes even within the ICDS could be functioning better once the programme is in place because usually these are one-shot (though occurring at frequent intervals) and need not be administered daily like the feeding programme. Consequently, it may require lesser effort and management, keeping in mind that the cost of administration is low with higher effectiveness in programme impact. Further, nutritional status is not dependent only on nutritional intake but has other determinants as well like the health status and level of education of the mother, quality of water and sanitation, and improvements in these aspects take a longer time. Therefore the impact of a feeding programme on the health status may be slower than that of an immunisation programme.

In states like Orissa where the feeding scheme has positive presence (as shown in Table 1) the proportion of undernourished children below three years is very high at about 62 per cent. Also, due to higher poverty levels the maternal health and access to other health care facilities are also likely to be poor. As evidenced from NFHS-2, 48 per cent of women in the age of 15–49 years in Orissa reported chronic energy deficiency (body mass index – BMI below 18.5) compared to the all India rate of 35.8 per cent. Similarly, the gap in immunisation rates between the rich and poor as well as rural and urban is noticed – about 33.5 per cent (76.1 per cent) for the “low” (“high”) standard of living households with rural (urban) rates at 42.2 per cent (56.4 per cent). This clearly justifies the need for an effective presence of schemes like ICDS, which have a regular feeding programme integrated with health care programmes for smaller children and to include the same for pregnant and lactating mothers as in the TINP.

Though the overall picture of the health status of young children in states like Tamil Nadu and Kerala is better in comparison to many other states, exclusion of a large proportion of poor children from such schemes deserves attention as even within these states there is a huge gap in the health status between the rich and poor. For instance, as evidenced from NFHS-2, in Tamil Nadu the proportion of undernourished children declines from about 47 per cent to 10 per cent between the households with “low” and “high” standard of living and such a sharp decline is observed for many other states as well.

### School Meals and Educational Attainment

A child can access school meals only if she attends school and hence it may appear that the causality runs from school attendance to meal access. However school meals here are seen as an incentive which would draw more children into schooling and keep them for longer years in school thereby positively impacting their educational attainment. There are many other states, exclusion of a large proportion of poor children from such schemes deserves attention as even within these states there is a huge gap in the health status between the rich and poor. For instance, as evidenced from NFHS-2, in Tamil Nadu the proportion of undernourished children declines from about 47 per cent to 10 per cent between the households with “low” and “high” standard of living and such a sharp decline is observed for many other states as well.

#### Table 7a: Distribution of Children (7-15 Years) across Educational Attainment Categories in BPL and APL Households and With and Without Access to School Meals for Boys and Girls in Select States: Rural

<table>
<thead>
<tr>
<th>State</th>
<th>Boys Access Education Status</th>
<th>Girls Access Education Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>All India</td>
<td>BPL</td>
<td>APL</td>
</tr>
<tr>
<td>NYI</td>
<td>17.8</td>
<td>62.6</td>
</tr>
<tr>
<td>Bihar</td>
<td>PY</td>
<td>-</td>
</tr>
<tr>
<td>Gujarat</td>
<td>NYI</td>
<td>3.7</td>
</tr>
<tr>
<td>Kerala</td>
<td>NYI</td>
<td>14.3</td>
</tr>
<tr>
<td>Punjab</td>
<td>NYI</td>
<td>59.8</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>NYI</td>
<td>35.8</td>
</tr>
<tr>
<td>West Bengal</td>
<td>NYI</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: BPL: Below Poverty Line; APL: Above Poverty Line.

(1) PY: BPL and accessing school meals; PN: BPL and not accessing school meals; RY: APL and accessing school meals; RN: APL and not accessing school meals.

(2) Educational Attainment categories: 1: Non-literate, 2: literate but below primary level education, and 3: Primary plus Middle.

(3) In regions/groups where the access rates are below 1 per cent figures are not reported.
educational attainment. In this sense if one cross-classifies the educational attainment by poverty status of the child’s household and its access status to school meals, one would expect that children from poorer households are likely to perform better in educational attainment if they have access to school meals compared to those who do not. A similar picture is also likely to emerge from a gender perspective. This section analyses the educational attainment data from the NSS towards providing such evidence.

Lower levels of educational attainment and poorer nutritional status are almost always associated with poverty. The aim of intervention programmes like school meal provision is to increase the enrolment and attendance rates as well as enhance the nutritional levels of children belonging to poorer households. School meals provision also has a social dimension in that it improves the achievements in educational attainment and nutritional status among girls and children belonging to socially backward communities.

Since the NSS consumption data does not indicate the school attendance status, a direct comparison between school attendance and provision of meals in school or impact of such schemes on attendance rates of girls is not feasible. However, the level of educational attainment is available in the consumption schedule and that is being used here as a proxy for school attendance. The educational attainment is classified into the following groups by NSSO in their schedules: not literate; literate through attending other institutions; literate but below primary; primary; middle; secondary; and higher secondary. Cross-classification of the educational attainment of children accessing meals or not at school, along with their economic status that is, whether they belong to below poverty line (BPL) or above poverty line (APL) households, does indicate favourable impacts of the presence of such schemes. Since the census of India considers literacy rates for population above seven years, the analysis here is also restricted to the age group of seven to 15-year-old children.

For all India rural, about 25 per cent of children in the age group of 7-15 years are not literate while in Tamil Nadu it is about 17 per cent. Himachal Pradesh and Kerala are the other states with lower rates of non-literacy at about 15 per cent. Kerala as is well known has had a history of higher literacy rate and the legacy continues while in Himachal Pradesh the higher literacy rate is attributed to the successful performance of “Operation Blackboard”. Urban rates of non-literacy are lower for all the states but a similar ranking of states is observed in the rural sector.

The gender bias in educational attainment is apparent when each of the groups is considered separately. About 47 per cent (37 per cent) of boys and 55 per cent (40 per cent) of girls in rural (urban) India are reported as non-literate. Himachal Pradesh, Tamil Nadu and Kerala are among the states with the lowest non-literacy rates among girls in both rural and urban areas ranging between 30 and 35 per cent and the gender gap is also marginal. In contrast to this, states like Bihar and UP have the highest figures ranging between 45 and 50 per cent for boys and 50 and 70 per cent for girls, the upper end values denoting the rural rates. For the remaining states the rural rates range between 40 and 45 per cent and urban rates at about 35 per cent with a larger gender gap in rural than in urban.

Tables 7a and 7b report the distribution of educational attainment of children belonging to BPL or APL households and, with or without access to the meals at school for a few select states. The educational attainment groups are: (a) non-literate, (b) literate but below primary level education and (c) primary plus middle level education. The table also reports the proportion of children in each of the economic status and meal access categories. This classification is done for boys and girls separately.

At the all India level though the proportion of children in poorer households accessing meals is far lower, the educational attainment among them is significantly better. This clearly indicates that an intervention programme can definitely improve educational attainment by improving enrolment and retention rates. In Tamil Nadu where the meal scheme performs the best, the percentage of children who have attained some educational level is higher if they access meals in school, irrespective of the economic status and the place of residence (rural or urban). This seems to be true among other states as well despite far lower percentage of children accessing meals at school. States like Bihar and West Bengal indicate very high proportion of poor children who are illiterate and definitely a scheme like this can go a far way in changing the present scenario. The educational attainments in urban areas for both boys and girls are better than the rural areas reflecting perhaps a higher level of awareness and to some extent better quality of schooling.

The gender gap is larger in rural areas for children belonging to BPL households and not accessing the scheme compared to their urban counterparts. In states like Kerala and Tamil Nadu the proportion of non-literate girls is substantially lower if they had access to the meal scheme and seems more beneficial for poorer households. However, even in states like Tamil Nadu a gender gap in educational attainment persists irrespective of economic status or access to school meals. This indicates that

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**Table 7b: Distribution of Children (7-15 Years) across Educational Attainment Categories in Poor and Non-Poor Households and With and Without Access to School Meals for Boys and Girls in Select States: Urban**

<table>
<thead>
<tr>
<th>States</th>
<th>Boys Access Status</th>
<th>Educational Attainment</th>
<th>Percentage of Children</th>
<th>Girls Access Status</th>
<th>Educational Attainment</th>
<th>Percentage of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>All India</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PY</td>
<td>9.6</td>
<td>59.5</td>
<td>27.8</td>
<td>1.1</td>
<td>13.7</td>
<td>57.0</td>
</tr>
<tr>
<td>RN</td>
<td>48.5</td>
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<td>30.3</td>
<td>31.1</td>
<td>52.2</td>
<td>26.9</td>
</tr>
<tr>
<td>RC</td>
<td>7.0</td>
<td>57.2</td>
<td>13.1</td>
<td>1.2</td>
<td>8.4</td>
<td>56.4</td>
</tr>
<tr>
<td>PN</td>
<td>30.6</td>
<td>33.3</td>
<td>20.0</td>
<td>66.5</td>
<td>31.6</td>
<td>33.1</td>
</tr>
<tr>
<td>Bihar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PY</td>
<td>63.7</td>
<td>22.4</td>
<td>12.5</td>
<td>41.3</td>
<td>66.4</td>
<td>17.4</td>
</tr>
<tr>
<td>RN</td>
<td>32.3</td>
<td>29.1</td>
<td>21.4</td>
<td>55.6</td>
<td>37.4</td>
<td>26.4</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PY</td>
<td>13.0</td>
<td>69.0</td>
<td>18.0</td>
<td>1.3</td>
<td>22.5</td>
<td>72.8</td>
</tr>
<tr>
<td>RN</td>
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<td>26.7</td>
<td>22.5</td>
<td>17.4</td>
<td>50.6</td>
<td>30.7</td>
</tr>
<tr>
<td>RC</td>
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<td>75.9</td>
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<td>2.7</td>
<td>8.5</td>
<td>68.2</td>
</tr>
<tr>
<td>PN</td>
<td>31.9</td>
<td>29.3</td>
<td>34.8</td>
<td>78.5</td>
<td>29.4</td>
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</tr>
<tr>
<td>Kerala</td>
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<tr>
<td>PY</td>
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<td>14.0</td>
</tr>
<tr>
<td>RC</td>
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<td>39.3</td>
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<td>46.4</td>
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<td>69.0</td>
<td>33.1</td>
<td>23.4</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PY</td>
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<td>33.1</td>
<td>8.3</td>
<td>10.9</td>
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<tr>
<td>RN</td>
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</tr>
<tr>
<td>RC</td>
<td>7.2</td>
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<td>30.8</td>
<td>8.0</td>
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<td>77.3</td>
<td>29.0</td>
<td>34.2</td>
</tr>
</tbody>
</table>

**Notes:** Same as Table 7a.

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this social problem is no doubt a bigger challenge to deal with. While schemes like these do seem to contribute towards reducing such biases other means and ways have to be devised to tackle gender discrimination.

Thus, in both rural and urban India access to the schemes, which essentially indicates regular school attendance, does improve educational attainment whether it is BPL or APL households. This result is irrespective of the proportion – large or small – of children accessing the scheme. It is needless to say that the presence of a noon meal scheme is only a positive externality towards ensuring higher enrolment and attendance rates but nevertheless seems to be an effective one in improving educational attainment. As is evident from the discussion above, this by no means indicates that educational attainment is purely a function of meal provision in school and better quality in education needs to be addressed along with the meal provision in school. As the PROBE (1999) report (based on a survey of large number of schools in northern India) and Swaminathan et al (2004) (based on the NSS data for Tamil Nadu) indicate the reason for not attending school lies more with school-related issues rather than with meal provision alone. The success of Operation Blackboard in Himachal Pradesh even without meal provision in school further corroborates this.

**Monetary Costs and Benefits**

Monetary costs and gains are no doubt important considerations in initiating and sustaining such programmes but more importantly ignoring childhood malnourishment or tardiness in programme delivery would cost heavily in terms of less productive adults and a rather high disease burden in future. India accounts for more than 50 per cent of deaths among children, largest among any Asian country, due to undernutrition [UNICEF 2002]. Estimates of cost of malnutrition as a per cent of GDP varies from 1 to 5 per cent depending upon the severity of malnutrition in India [Horton 1999 and ASCI 1997]. Similarly, Popkin et al (2001) show that the economic burden of stunting is about 0.7 per cent of GDP for India and 0.5 per cent for China in 1995 and the projected values for 2025 decline rapidly for China compared to India due to lower prevalence rate of severe and moderate stunting. In contrast to this loss in GDP in future, current expenditure of about 1-2 per cent of GDP on pre-school and school programmes which include not only providing meals in anganwadis and schools but also supplementing with micronutrient intakes, nutrition education and deworming initiatives would no doubt prove to be a prudent investment.

**Conclusion**

The present study used the most recent large sample household expenditure survey data of NSS to look at the access to meal programmes across states of India in both rural and urban sectors. Use of NSS data for analysing access to school meal programme has been attempted for the first time through this study. The analysis is carried out across age groups of children, their economic status and across different social and occupational groups. Wherever possible, broad comparisons are drawn on the health status and educational attainment of children in regions where such schemes are better functioning to those where it is not. States like Tamil Nadu have not only successfully implemented meal schemes and sustained them for a long period but also have better functioning public health and education systems which have resulted in improved performance on nutritional and health status and educational attainment [Dreze and Sen 2002].

The results from this study corroborate the actual ground level realities as far as the mid-day meal programme is concerned. Only a few states in India have the scheme in place, with Tamil Nadu standing out in access rates, with better targeting in rural than in urban areas and among the vulnerable including girl children. More importantly, the benefits of the presence of meal programmes do reflect on the educational attainment signifying that for the vulnerable sections a scheme like this can serve its purpose if effectively targeted. In urban areas, though the educational attainment is better even among those not accessing the scheme but still the gap persists between the two access groups and considerably affects the performance of girl children. Thus, there is scope for considerable improvement and the policy-makers need to take notice of this. The need for the mid-day meal scheme has so far been emphasised mainly to improve school attendance but the nutritional status of the children is also impacted by the intake of nutritious meals regularly. The evidence on this is less but definitely as important for the overall development of the children. As for the pre-school feeding programme through the ICDS is concerned, the data seems to reflect a very low access rate though its distribution between states as well as between sectors is consistent with the known performance of such schemes. Since the ICDS does not have a meal component but a food supplement component, and as the children are younger and all of them may not be in a position to consume a full meal on their own, a direct question about access to such a scheme may have elicited better response.

A comprehensive survey by Drake et al (2002) across various countries on the impact of provision of school meals indicates positive impacts on anthropometric status, health, and cognitive development. However it also indicates that the improvements in cognitive abilities to a large extent depend on the quality of schooling rather than food provided. The same study also points to some evidence from the donor agencies suggesting that school feeding programmes though seem to have a direct impact in increasing the attendance rates particularly of the girls in the short run but once the scheme is withdrawn, drop out rates are higher either due to poor schooling quality or the decline in need to educate the children arising from a lack of employment opportunities (and thereby lowering the intrinsic demand for education). These experiences are worth keeping in mind while designing a new programme or revamping an existing one to improve its efficiency.

Since the completion of this NSS survey many other states like Rajasthan are on their way to implementing the noon meal programme and the initial findings indicate a steep jump in school attendance rates [Khera 2002]. Similarly, Dreze and Goyal (2003) based on a primary survey of schools in some parts of India, two years after the Supreme Court ruling, find a beneficial impact of the introduction of noon meals on child nutrition and school attendance, while fostering gender and social equity. The universalisation of ICDS or the very recent increased budgetary allocation by the central government for the mid-day meal scheme to schools all over India are steps in the right direction, but one hopes that the implementing agencies would pay more attention to effective management and learn from past
experiences for improved targeting and efficacy. One hopes that the next quinquennial NSS round would perhaps highlight these changes to indicate more widespread coverage and also positive impacts. The present study clearly highlights better health and education achievements among children in states where such schemes are in existence and it is imperative that the policy makers take note of these and ensure the success of the schemes once in place.

Email: brinda@isec.ac.in

Notes

[The author would like to thank A Vaidyanathan and K S Kavi Kumar for useful discussions and suggestions while drafting the paper; and Padmini Swaminathan and Jean Dreze for their written comments which significantly improved the readability of the paper. However, any errors that remain are due to the author.]

1 A terminology used to denote children who are neither in school nor in labour force.


3 Drake et al (2002) discuss the performance and impact of such schemes among school age children based on different country experiences. Also Alderman et al (2001) show that along with policy variables household behavioural choices that improve child’s health and nutrition have a strong impact on school enrolment and more importantly in reducing the gender gap in it.

4 The age group of 10 to 15 years is considered separately for boys and girls, as this age is the setting in of adolescence with a higher possibility of girl children being withdrawn from school. Further from this age onwards the nutritional requirements of males are higher than those of females.

5 An examination of the unit level data shows that very few households have access to the scheme but the inflation factors associated with these units are very large due to which the access rate in the sample is only about 2 per cent while that in the population is estimated as 18 per cent. This large divergence between sample and population estimates seems implausible and hence the urban Himachal Pradesh data has not been reported in further discussions below.

6 Anganwadi workers are expected to go from house to house to bring children out to the centre but some studies have shown that the incentive to do so is less and sometimes the area to be covered is also large within a limited time of the day.

7 25 meals in a month for 9 months works to 225 meals in a year or an average of 18.75 meals per month. If the number of working days in a month is reduced to 20 then the average number of meals per month is about 15.

8 The information on school attendance is available only in the employment data. Since in the 55th NSS round the consumption and employment data were obtained from different sets of households, collating information from the two databases is not possible.

9 The term non-literate is being used instead of illiterate as the latter sounds more like a negative connotation. One hopes that the “illiteracy” could be because that these children have either not yet attained the proficiency due to poor quality of schooling even though they may be attending schools or that those who are not attending schools will attain minimum literacy level sooner or later through some non-formal mode of education.

10 Estimates suggest that protein energy malnutrition in childhood is associated with a 15 point decrease in intelligent quotient (IQ) which in turn is associated with a 10 per cent drop in earnings and hence productivity. The adults who were moderately malnourished as children would be 2-6 per cent less productive than their counterparts who were not malnourished and that iron deficiency anaemia is associated with a 17 per cent loss of productivity in heavy manual labour.

References


