

The Impact of the Midday Meal Scheme on Nutrition and Learning



YOUNG LIVES POLICY BRIEF 8

August 2010

Food insecurity and poor nutrition remain a problem in many developing countries and can have profound effects on children's health and their development. The Midday Meal Scheme in India is a programme covering primary school children to improve nutrition as well as increase educational enrolment, retention and attendance. This policy brief examines the effect of the scheme on nutrition (through testing height and weight) and on children's learning (through testing vocabulary). We find significant evidence of positive, protective effects, particularly for children growing up in communities affected by drought, suggesting there are substantial benefits of school feeding schemes for children's learning and development.

The Midday Meal Scheme in India is the largest school meal programme in the world, covering an estimated 139 million children. India also has the largest early child development programme in the world (the Integrated Child Development Services or ICDS), which provides free meals as part of a nutritional programme. The Midday Meal Scheme has bold objectives: it aims to enhance enrolment, retention and attendance among primary school children while simultaneously improving their nutritional levels.

Although the scheme officially started as a centrally-sponsored initiative in 1995, it was limited to providing dry rations and was not fully implemented in most states until 2002. Following a Supreme Court ruling in November 2001, all State Governments were mandated to introduce cooked school meals, and by 2003 most states (including Andhra Pradesh) had started providing school meals. Crucially, in 2004 a Supreme Court order made it mandatory to provide midday meals during summer vacations in 'drought-affected areas'. This was an important intervention, as drought has affected large sections of India's rural population. In the Young Lives sample, almost 35% of the rural households report having suffered from drought between 2002 and 2006.

In India, there has been considerable interest from State Governments in the performance of the Midday Meal Scheme, particularly in relation to the benefits it brings marginalised children. While there is evidence from a number of other studies that the scheme exerts a positive influence on enrolment and may increase daily calorific intake on school days, the impact on longer-term nutritional status and the effect of school meals on learning and cognitive skills has not been clear. Young Lives unique longitudinal data enables us to address these impact evaluation questions.

MIDDAY MEALS IN INDIA

- Despite long-established early childhood care and nutrition provision under the auspices of the Integrated Child Development Services programme (ICDS), India still faces a malnutrition crisis: 45% of children under the age of 5 in India are stunted (low height-for-age), higher than for all of sub-Saharan Africa (UNICEF 2009).
- The Midday Meal Scheme was rolled out across India from 1995 in order to improve children's nutrition and learning. It now covers an estimated 139 million primary school and was extended following a Supreme Court ruling in 2001 to provide a hot meal rather than dry rations.
- Among the children surveyed by Young Lives in Andhra Pradesh the scheme appears to deliver significant nutritional benefits for children aged 4 to 5, which can be seen in better height-for-age and weight-for-age than would otherwise be expected, suggesting that the midday meal helps reduce serious malnutrition.
- For older children (aged 11 to 12) there is evidence of significant positive impacts on children's learning, although it is not clear if these effects are generated by less hunger or by improved school attendance.
- The school meals have most impact in areas affected by drought. For younger children, there are large and significant gains in height-for-age and weight-for-age, which more than compensate for the negative effects of the drought.

The research challenge

Young Lives data is well suited to shed light on the impact of the Midday Meal Scheme because of its design (information was collected from the same children in 2002 and 2006/07). Data is currently available on two cohorts, a younger and an older group (aged 4 to 5 and 11 to 12 years respectively when data was collected in 2006/7). Information was collected on their nutrition status (assessed using anthropometric measures including weight and height for age, standard measures of under-nutrition and long-term malnutrition) and their learning (measured with reading, writing and cognitive ability tests) both before and after they received meals under the scheme. We can also compare children covered by the scheme with those who do not receive a meal (by comparing children in government schools with those in private schools) to try to understand its impact.

Isolating the effect of the Midday Meal Scheme on nutrition and learning is not a straightforward task. Children in government schools who receive the meals are typically from poorer, more disadvantaged households than children in private schools who do not get the meal. Simply comparing these two dissimilar groups would not reveal the scheme's true impact, so instead we use regression techniques to control for observed differences between the two groups and therefore to obtain a more accurate analysis.

The impact on nutrition

It is possible to look at children's nutrition by comparing the average change in their height- and weight-for-age between 2002 and 2006/07 for children who were and were not receiving a meal. Table 1 presents the detailed picture that emerges using regression techniques (controlling for various other factors, such as gender, caste and household expenditure) presented to show the effect in standard deviations. The table focuses specifically on children in drought-affected households.

Table 1. *Schooling outcomes at age 12 (Young Lives older cohort)*

	Impact of drought	Effect of Midday meal
Change in weight-for-age (standard deviations)	-0.587***	0.484
Change in height-for-age (standard deviations)	-0.634***	1.581

*** Indicates statistical significance at 1% level

Comparing the average change between 2002 and 2006/07 for children who were and were not receiving a meal shows that the midday meal had a positive effect in increasing children's height-for-age. Breaking these changes down further by whether or not children were affected by drought shows that the average impact of the scheme is much greater for children affected by drought than for other children, having both a positive and statistically significant effect on both their weight-for-age and height-for-age. Receipt of a midday meal therefore seemed to have a strongly beneficial effect for children affected by drought.

For young children below the age of 5, experiencing drought has a significant negative impact on both height-for-age and weight-for-age. Controlling for other factors, the positive effect of the midday meal on height-for-age is greater than the negative impact of drought. This positive effect might also have been enhanced by the 2004 Supreme Court order mandating the provision of midday meals during the school summer vacation in drought-affected areas.

For the older children we surveyed, there was no significant pattern in the average effect of receiving a midday meal on height-for-age or weight-for-age. This is true both for children who were affected by drought and those who were not.

1 Standard deviations are used to measure the distance from the mean (i.e. how much better or worse children are doing than their peers, on average). This technique makes it easier to interpret the impact and importance of different factors, for example as in this case, the impact either of drought or of receiving a meal at school.



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The impact on learning

We also looked at the impact of the Midday Meal Scheme on achievement based on a comparison of children who were and were not covered by the scheme.

This analysis (using propensity score matching) found that receipt of the Midday Meal Scheme was associated with a significant positive impact on scores in the Peabody Picture Vocabulary Test (a measure of receptive vocabulary), having controlled for child and household characteristics. This statistical test included a measure of the child's performance in the Raven's test (a multiple-choice intelligence test) before the introduction of the Midday Meal Scheme and so also indicated change over time. The effect is large in absolute terms, ranging between 0.775 and 0.794 standard deviations, indicating children covered by the scheme were more likely to show higher scores than would have been otherwise predicted.

This positive effect could have been caused by several factors: improved school attendance in order to receive the meal each day, better nutrition leading to better overall learning, or a rise in short-term concentration due to the elimination of classroom hunger. It is hard to disentangle these different effects: the lack of impact on the older children's nutrition status suggests that the scheme's learning impact occurs because of better attendance or concentration. It is important however to note that our analysis does not control for reforms affecting the quality of teaching or learning in government schools such as, for example, educational reforms under the Sarva Shiksha Abhiyan programme (to achieve elementary education for all by 2010). Although our findings are suggestive of the Midday Meal Scheme's benefits on learning, future investigation of this issue would add to the understanding of the scheme's effects.

Policy implications

Our findings illustrate the important role the midday meal plays in reducing the effects of shocks by protecting the nutritional status of vulnerable children, especially during periods of drought. The 2004 Supreme Court order mandating schools to provide midday meals during the summer vacation in drought-affected areas appears to have been a successful intervention, and highlights the importance of ensuring all nutritional and school feeding programmes have special provisions for vulnerable children during periods of drought. The findings emphasise the importance of determining the specific impacts of nutrition programmes on vulnerable groups rather than just the average impact, and of looking at programmes in the context of how well they mitigate the effects of shocks on vulnerable children.

The impacts on nutrition, both the negative impact of drought and the positive benefit of the Midday Meal Scheme are seen among the younger but not the older children within the Young Lives study suggesting that older children are less vulnerable to nutrition shocks, and that children's responsiveness to supplementary feeding declines with age, although elsewhere the potential for 'catch-up' has been observed.

The current approach to malnutrition in India has focused more on food-based interventions and supplementation for children after the age of 3 rather than on programmes targeting children in the first two years of life. Additionally, according to Save the

Children India (2009) only 26% of age-eligible children received supplementary food in the Integrated Child Development Services. This suggests there may be large potential gains from extending and improving nutrition programmes to target very young children, including the ICDS, and from ensuring programmes reach the most vulnerable groups in areas where drought and similar problems are most severe. While Young Lives findings make clear that food supplementation programmes like the Midday Meal Scheme can have a nutritional benefit and reduce hunger, research underlines the need to ensure that younger children are covered by schemes in the first two years of life (Horton 2008). This 'early impact' argument strengthens the case to extend ICDS investments in the early years alongside later interventions.

Although it is important that young children are covered by schemes which can improve nutrition, we also find a positive impact of midday meals on learning for older children. It is difficult to determine exactly how this effect took place, but it nonetheless demonstrates that school meals play a role in contributing to learning outcomes (i.e. even if there is not a health impact there is a learning impact). While analysing the benefits of midday meals for younger children's learning was not feasible with our data from 2006 (as the children were still young and had not been in school long enough), this may be possible with data from future rounds, and with our third survey round (collected in late 2009) we will also be able to investigate how long the nutritional and learning benefits persist.

RELATED RESOURCES

Farzana Afridi (2007) 'The Impact of School Meals on School Participation in Rural India', seminar paper, Centre for Development Economics, Delhi School of Economics

Richard Horton (2008) 'Maternal and Child Under-nutrition: An Urgent Opportunity', *The Lancet* 371: 179

Michele Gragnolati et al. (2005) *India's Undernourished Children: A Call for Reform and Action*, Health, Nutrition and Population Discussion Paper, Washington DC: World Bank

Reetika Khera (2006) 'Midday Meals in Primary Schools: Achievements and Challenges', *Economic and Political Weekly*, 18 November

Save the Children India (2009) 'Freedom from Hunger for Children under Six', New Delhi: Save the Children India

UNICEF (2009) *Tracking Progress on Child and Maternal Nutrition: A Survival and Development Priority*, New York: UNICEF

ACKNOWLEDGEMENTS AND CREDITS

This Policy Brief has been written by Caitlin Porter, Abhijeet Singh and Ajay Kumar Sinha based on the Young Lives student paper: A Singh (2008) *Do School Meals Work? Treatment Evaluation of the Midday Meal Scheme in India*.

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