Impact of Incentivising Education on Malnutrition and Health:

Findings from Akshaya Patra world's largest School lunch programme

Background

Malnutrition is a formidable Public health challenge every country is facing (IFPRI 2014). The consequences are literally devastating. An estimated 45 percent of deaths of children under age 5 are linked to malnutrition (Black et al. 2013). Malnutrition and diet are now the largest risk factors responsible for the global burden of disease—by far (Forouzanfar et al. 2015). In 2016, globally, approximately 155 million children under 5 were stunted, nearly 52 million children under 5 were wasted and 17 million were severely wasted. (Levels and trends in child malnutrition UNICEF / WHO / World Bank Group Joint Child Malnutrition Estimates, Key findings of the 2017 edition).

With a score of 28.5 on Global Hunger Index 2016, India is a Low-Income Food-Deficit Country (http://www.fao.org/countryprofiles/lifdc.asp?lang=en). 15.2% of India's Population is below minimum level of dietary energy consumption (http://www.fao.org/economic/ess/ess-fs/en/). Rated as a country with 'serious' hunger levels as per the global Hunger Survey 2016, India ranks 97 among 118 developing nations.

Results from Rapid Survey on Children (RSoC) conducted during 2013-2014, show that 15.2% children in India are undernourished. Over 40% of children receive less food than they should. As per Burden of Malnutrition 2011, India has stunting country rank of 1 and we have world stunting burden of 38%. National Family Health Survey round-4, gives the latest trends and data on Malnutrition in India. Below are the key malnutrition Indicators as per NFHS-4:

- Children under 5 years who are stunted (height-for-age) = 38.4
- Children under 5 years who are wasted (weight-for-height) = 21.0
- Children under 5 years who are severely wasted (weight-for-height) = 7.5
- Children under 5 years who are underweight (weight-for-age) = 35.7
- Children age 6-59 months who are anaemic (<11.0 g/dl) (%) = 58.4

Correlation between Malnutrition and Education: Evidences from Literature

Malnutrition results from the interaction of poor-quality diets and poor-quality health and care environments and behaviours. It creates a cascade of individual and societal challenges (Global Nutrition Report, 2016). Good nutrition allows children to grow, develop, learn, play, participate and contribute – while malnutrition robs children of their futures and leaves young lives being uncertain. Stunting is the devastating result of poor nutrition in early childhood. Children suffering from stunting may never grow to their full height and their brains may never develop to their full cognitive potential. These children begin their lives at a marked disadvantage: they face learning difficulties in school, earn less as adults, and face barriers to participation in their communities. Wasting in children is the life-threatening result of hunger and/or disease. Economists estimate that every child whose physical and mental development is stunted by hunger and malnutrition stands to lose nearly 10 percent in

lifetime earnings. Further, there are empirical evidence from global research pointing out that malnourishment among young children influences schooling in several direct and indirect ways. In India, chronically malnourished children, about one of every four children born today, are significantly less able to read, write a simple sentence, or perform basic arithmetic (Save the children) and thus affecting their education. Results from a multi country study conducted by Young Lives, establishes that malnourished children scored 7% lower in mathematics tests, were 19% less likely to be able to read at age 8, and were 13% less likely to be in the appropriate grade for their age than those who are well nourished. Study further establishes that investing in nutrition at an early age has considerable economic benefits, improving learning, job prospects and earnings (http://www.savethechildren.org.uk/sites/default/files/images/Food_for_Thought_UK.pdf). EFA Global Monitoring Report 2012, shows that investment in learning, through strengthened health and education systems, provides long-term benefits for individuals and societies. In another investigation conducted with Brazilian school-age children concludes that growth status of children is positively correlated with competency in arithmetic (Brito and de Onis, 2006). The first ever study that investigated a longitudinal relationship between household food insecurity and social skills in children found that food insecurity at kindergarten predicted impaired academic performance in reading and mathematics for both boys and girls (Jyoti et al, 2005).

The Akshaya Patra Foundation implementing partners for Governments of India's scheme on school lunch

The Government of India has launched several programs to converge the growing rate of under nutrition in children. To boost enrolment in schools, and simultaneously address the problem of malnourishment among school children, the Government of India launched the National Programme of Nutritional Support to Primary Education, popularly known as Mid-Day Meal Programme (MDM) in August 1995. In partnership with central and state governments, Akshaya Patra Foundation runs the world's largest NGO-run midday meal programmes, serving freshly cooked meals to over 1.7 million school children in government and government-aided schools in India every school day through its centralised kitchens in 12 Indian states. At a cost of $15.27 for a child's entire years school lunch, meals served by Akshaya Patra are designed based on local food preferences & complies with nutritional norms of government of India. The Akshaya Patra (TAPF) recipes contain different food groups (Cereals, pulse, vegetables, nuts, spices, sugars and jaggery, oils etc.) to ensure the nutrients. The recipes are standardized by calculating nutritive values referring NIN guidelines. Providing nutritious food types-which includes seasonable vegetables, nuts, fortified food ingredients like fortified analogue soy dal, Fortified Rice and double fortified salt.

Methodology

The study was deployed in year 2016-17 as an Experimental Randomised comparative Study Design of programme (TAPF intervention) vs control (non-TAPF intervention) schools. Student

sample of control module and test module is weighted to keep the profile variables similar across the schools. Mixed-method approach of data collection was used with Quantitative data results complemented with quantitative insights. Impact indicators of school-lunch programme Nutritional status of children through Anthropometric measurement: Height, Weight and Mid-upper circumference was covered. Random sample selection method was adopted to achieve a total sample size of 2640 (1600 student, 800 parents, 160 teachers and 80 schools). Besides survey, Retrospective School record data was collected for last three academic years for measuring academic performance.

Preliminary findings from Impact of Mid-day meal scheme on health of children

The preliminary results from study highlight the positive impact of this incentivisation scheme on educational indicators. Further, it also shows a positive impact on health and hunger also.

- Average school dropout rate is found as 1.7% for primary and 2.5% for upper primary TAPF schools, whereas, the national dropout rate in at primary level was 4.34%, and for upper primary level the drop out ratio was 3.77%. In TAPF schools, the overall as well as the dropout rate for girls is coming down over the years. The attendance rate in the schools is as high as 90% on the survey day.
- A large proportion of parents and students reported that many children come to school every day because of midday meal program. Data inferred that MDM program itself is an incentive for bringing 9 out of 10 children in school every school day over the years.
- Akshaya Patra is effectively addressing Classroom Hunger as for two-thirds of children MDM is first meal of the day.
- TAPF mid-day meal has a positive impact on academic performance of the students. Nutritious meal served by TAPF has improved the attention and students have performed better in their annual exam and academics with 55 percent children in III to VII scored >80% marks.
- Nutritional status of children from TAPF schools have shown significantly better BMI with 78% boys and 84% girls had normal BMI which was found to be much lower in case of students from Non-TAPF schools. Further, little more than one fourth of students (avg. 22%) from TAPF schools were found in the underweight category (-2sd) based on WHO BMI for age standard. However, this proportion was much higher in case of non TAPF schools highlighting that Akshaya Patra is addressing malnutrion which is a long-term impact of this educational incentive scheme programme.
- Girl child enrollment in TAPF schools is 47% compared with 44.7% in no TAPF schools. Drop-out of girl child in TAPF school is 1.9% and that of Non-TAPF school is 3.4%. Attendance for both boys and girls was similar, average attendance for girls (90%) was marginally better in comparison to boys (87%) for TAPF schools. So we can conclude that TAPF is bringing more girls to school, making the girl child continue

education and finally be regular to school. Significant health outcome were seen among girls children of TAPF schools, as 84% girls (in Bangalore) and 68% girls (in Telangana) in TAPF schools had normal BMI compared to 71% and 61% girls in Non-TAPF schools in Bangalore and Telangana respectively.

- MDM also acts as motivator for students. It was reported that it motivates to participate in school activities by ~75% teachers and ~60% children

Further, a correlation analysis on our sample clearly revels the relation that nutrition status has on academic achievements:

- The attendance of students at school is strongly correlated with nutritional status indicators and students' achievement. BMI of the students have positive relationship with performance ($P<0.001$).
- Students' attendance has a positive correlation with students' achievement.
- The analysis further suggests that students with lower nutritional status are more likely to have less school attendance.
- Students with Higher satisfaction rate to MDM are more likely to feel MDM motivates them for going to school and intern have higher attendance and better grades