



Coverage of essential nutrition interventions in rural West Bengal

HOW FAR THE CONVERGENCE HAS REACHED TO MOST VULNERABLE HOUSEHOLDS. LESSONS FROM SUNDARBANS, WEST BENGAL

SAVE THE CHILDREN INDIA

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Executive Summary

'Dietary Risks' constitutes the largest risk factor responsible for the global burden of disease as per the Global Burden of Diseases Study 2013. Around 45% of deaths of children under the age of five year is attributed to Malnutrition. With 46.6 million stunted and 25.5 million wasted children, India has the highest burden of malnutrition in the world as per Global Nutrition Report 2018.

A study in West Bengal by National Institute of Cholera and Enteric Diseases and Save the Children reveals that, underweight and stunting prevalence 40% and 51% of the children respectively. The situation is even grimmer in rural areas of the State. Sundarbans is one such geography in the State, which is even more vulnerable to public health challenges owing to its ecologically fragile location close to the Bay of Bengal. Merely 9% of children between the age of 6 -23 months in Sundarbans receive minimum adequate diet as per a recent study. Therefore, it becomes imperative to understand the extent to which nutrition services are reaching this area and more precisely at the household levels.

To understand the availability of services having a bearing on the nutrition status of the children under 2 years of age, a cross-sectional randomised 30 x 30 clusters survey on co-coverage of 13 nutrition specific and 6 nutrition sensitive interventions in 4 gram panchayats of Sandeshkhali block of Sundarbans was conducted in December 2019. A total of 912 caregivers of children aged 6-24 months were interviewed. The survey tool for data collection developed in digital forms, both in English and Bengali (the local language of West Bengal) was pre-tested and adapted according to expected responses, nature of how respondents understand the questions and settings. Household survey data was collected on Kobo collect application on a handheld device (Android Based Tablet).

About half of the sampled households are in the poorest quartile and have nuclear families. More than 40% respondents were mothers of children from the age bracket of 6 to 12 months. An analysis of the coverage at household levels indicates abysmally low coverage (1.5%) of all 13 nutrition specific interventions. Whereas coverage of 6 nutrition sensitive interventions was found to be 4%. If we consider coverage of all 19 nutrition sensitive and specific interventions, it was found to be almost non-existent (0.12%). A statistically significant association between access to all 6 sensitive interventions and access to all 13 specific interventions was found in the study. Similarly, significant association between awareness of Swacch Bharat Abhiyaan scheme (Mission Nirmal Bangla) and access to improved toilets has been established by the study. Institutional delivery has been found to have a significant association with access to 4 antenatal check-ups and provision of Janani Surakhsha Yojana (JSY) funds to pregnant mothers. Pregnant women availing 4-ANCs, has 2.6 times more likelihood of delivering in an institution.

The conspicuously low coverage of services at household level is a clear indicator of poor convergence of the government schemes and programs. It is a reflection of a disjointed action on the part of various departments of the government. More than 'action', it is a manifestation of sheer 'ignorance' about cumulative gap generated by collective non-accountability of the system. This calls for reconsideration of household level delivery of services as a wholesome package of interventions rather than seeing them as discrete departmental deliverables.

Background and Rationale

Health and well-being of individuals and communities require actions, which are not restricted only to health systems but also extend to determinants and risks to health through multi-sectoral approaches. These actions not only focus on mortality but also focus on health, functioning and well-being. Nutrition is one such key determinant of health, and malnutrition in all its forms is a key risk factor, with serious impact on morbidity and human capital across the life-cycle. Malnutrition includes stunting, wasting, underweight, micronutrient deficiencies, overweight and obesity (among both children and adults), and associated chronic conditions such as diabetes, cardiovascular disease and some cancers. Malnutrition, in one form or another, is estimated to affect one in three people globally and is linked to morbidity and mortality. The Global Burden of Disease Study 2013 identified “dietary risks” as constituting the largest risk factor responsible for the global burden of disease (11.3 million deaths and 241.4 million disability adjusted life years [DALYs]), with child and maternal malnutrition (1.7 million deaths and 176.9 million DALYs), and high body mass index (BMI; 4.4 million deaths and 134.0 million DALYs) not far behind. Approximately 45% of mortality in children aged under 5 years is linked to malnutrition. Malnutrition reduces a nation’s economic advancement by at least 8% because of direct productivity losses, losses via poorer cognition, and losses via reduced schooling.ⁱ

Global Nutrition Report 2018 indicate that, India tops the list of countries with 46.6 million children who are stunted. India also accounted for 25.5 million children who are wasted. It also figures among the set of countries that has more than a million overweight children. It is a known fact that malnutrition is responsible for more ill health than any other cause. As per National Family Health Survey-4 (2015-16), with 24.2% stunted, 17.4% wasted and 19.6% underweight children West Bengal is one of the high burden states with respect to malnutrition in India. 70% children under the age of five are anaemic in the state. The Infant Mortality Rate in West Bengal is 27 as per NFHS 4 with rural rate of 32 per 1000; under five mortality is 38 in rural West Bengal. Women literacy rate is 67% with 21% rural women become pregnant/ mother between the age of 15 – 19 yrs. Children between the age of 6-59 months who are anaemic in rural areas are 54%. Rural women b/w the age 15-49 years who are anaemic 64.4%.

Sundarbans poses its unique public health challenge due to geographical-vulnerability. The Sundarbans is a cluster of low-lying islands in the Bay of Bengal famous for its unique mangrove forests- the world’s largest. This region is ecologically fragile and climatically vulnerable. It faces severe threats of climate change through frequent cyclones and tidal waves, the increasing salinity in water and soil has destroyed the productivity of the land. Changes in the environment have a large influence on the health of the local communities, as climate change induced disasters bring with them unique challenges. Sundarbans’ population is diverse, with people from many ethnic, religious and occupational groups coexisting together. They primarily depend upon agricultural activities and fishing for their livelihoods. As impact of changing climatic conditions, the source of livelihood is depleting, besides their traditional sources of food. Nutritional intakes are also diminishing with a serious consequence on inhabitants’ nutritional status especially on children, leading to long term hampering effect on their physical and cognitive development. Children and women are obviously the most vulnerable group susceptible to these changes with no or negligible social security in place. A study by National Institute of Cholera and Enteric Diseases and Save the Children reveals that, underweight and stunting prevalence 40% and 51% of the children respectively, 8% had severe acute malnutrition. Anaemia prevalence in women of all the villages was >40% underscoring a severe public health situation with one fourth of the women having low body-mass-

index (BMI). In addition, another study on dietary adequacy in Indian Sundarbans reported that a mere 9.33% of children between 6 and 71 months received a minimum adequate diet.

Tackling malnutrition requires interventions, which are direct in nature like adequate food and nutrient intake, feeding, caregiving and parenting practices, and low burden of infectious diseases these are called 'Nutrition Specific' interventions. These are the interventions or programmes that address the immediate determinants of foetal and child nutrition and development. Whereas, there are other interventions or programmes that address the underlying determinants of foetal and child nutrition and development like food security; adequate caregiving resources at the maternal, household and community levels; and access to health services and a safe and hygienic environment known as 'Nutrition Sensitive' interventions. To address the malnutrition both 'Nutrition Specific' and 'Nutrition Sensitive' interventions are required. Several Studies have shown that the Nutrition Sensitive interventions have even greater impact on nutrition outcomes than nutrition specific ones. The Lancet 2013 series shows that with 90% coverage of nutrition specific interventions we can reduce stunting by only 20% and the remaining part of reduction would come from the nutrition sensitive sectors. Nonetheless, both are crucially important to fight malnutrition. Government through its schemes has been implementing both specific and sensitive interventions over the decades albeit in a more vertical way. Tackling intergenerational effects of malnutrition would require a convergent action to deliver a package of interventions both sensitive and specific at household level, particularly those having pregnant mothers and children under 2 years of age. We intend to understand how much of this convergent action has taken place through measuring the number of specific and sensitive interventions being delivered at households having women with a child aged 6–24 months.

Objectives of the study

Primary Objective:

To measure the coverage of nutrition specific and sensitive interventions by sampled households in the intervention area of Sundarbans, West Bengal.

Secondary Objectives:

To characterise households who have accessed all the essential nutrition interventions so that appropriate measures can be taken in multiple sectors with an interest, and an ability, to reshape the multiple determinants of malnutrition.

Approach & Methodology

A cross-sectional randomised 30 x 30 clusters survey was conducted between 10th December 2019 and 31st December 2019 where sampling was done as per probability proportion to size. For defining effective convergence, we referred and considered the definitions used by Menon et al 2019ⁱⁱ and recruited the mother who has a child between 6-24 months so that all the relevant indicators can be assessed for the first 1,000 days period; covering pregnancy and the first two years of the child.

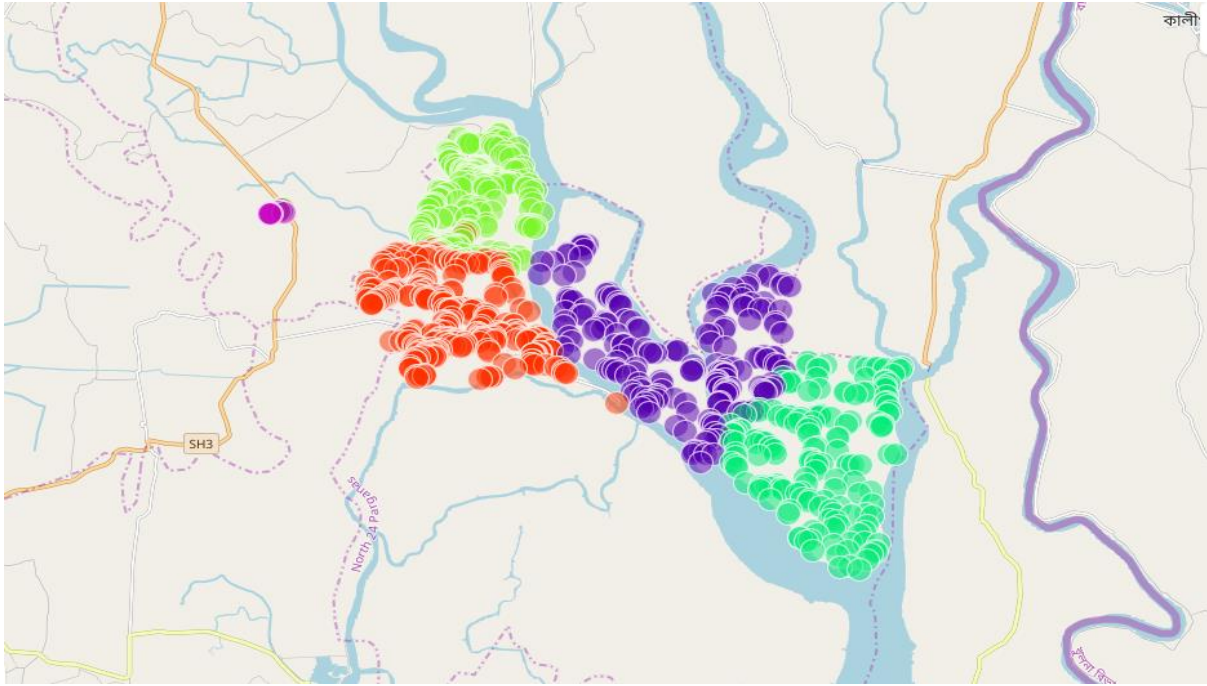


Figure 1: 912 households sampled across four Gram Panchayats in Sandeshkhali block, Sundarbans, West Bengal

Sample size:

To establish a representative sample of households, 30 clusters were randomly selected across four gram panchayats in the intervention block, the smallest unit for which there is population data. These sampling units (villages) selected are called as clusters. A total of 912 caregivers of children aged 6-24 months were interviewed. Households having at least one child between 6-24 months of age as on 10th Dec 2020 were considered as the inclusion criteria for the household.

Sampling methods:

Using a map, each cluster was divided into four quadrants. In each quadrant, one of five starting points was chosen at random. At each starting point, a water bottle was spun to determine the direction of the households for selection. Once the direction was determined, the number of households from the starting point to the end of the quadrant in the direction of the bottle was estimated and a house was selected at random as the starting household. Following the direction of the bottle spin from this first household, the next eligible households were interviewed. This process was repeated in each of the four quadrants of the cluster.

Households were screened for eligibility based on having a child between 6-24 months of age at the time of survey. Within each eligible household, only one eligible child was selected to be the focus of the survey. For households having more than one child in the same age group, the younger child was considered as the index child. In case of twin, index child was selected using simple random sampling by writing the names of all eligible children on slips of paper, placing them in a bag, and picking one out. The age of children was verified by health record whenever possible and when unknown, was estimated using life event calendars and re-call of the mother.

Survey tools:

The survey tool for data collection developed in digital forms, both in English and Bengali (the local language of West Bengal) was pre-tested and adapted according to expected responses, nature of how respondents understand the questions and settings. After field-testing of the tools, all the surveyors were oriented on the tools and methodology.

Target Respondents:

The primary respondents under the study were mothers who have a child between 6-24 months

Geography:

Sundarbans comprises of 19 administrative blocks where Sandeshkhali II Block of North 24 Parganas district is one of the nine vulnerable blocks from this region with poor health status and high service delivery gap. There are only two Nutrition Rehabilitation Centres near to Sandeshkhali II block, at Basanti (in South 24 Pargana) and Bashirhat (in North 24 Pargana) though both are very difficult to access to due to rivers in between and longer road connectivity. In such a geography, 912 households were sampled across four Gram Panchayats in Sandeshkhali block, Sundarbans, West Bengal

Data Analysis:

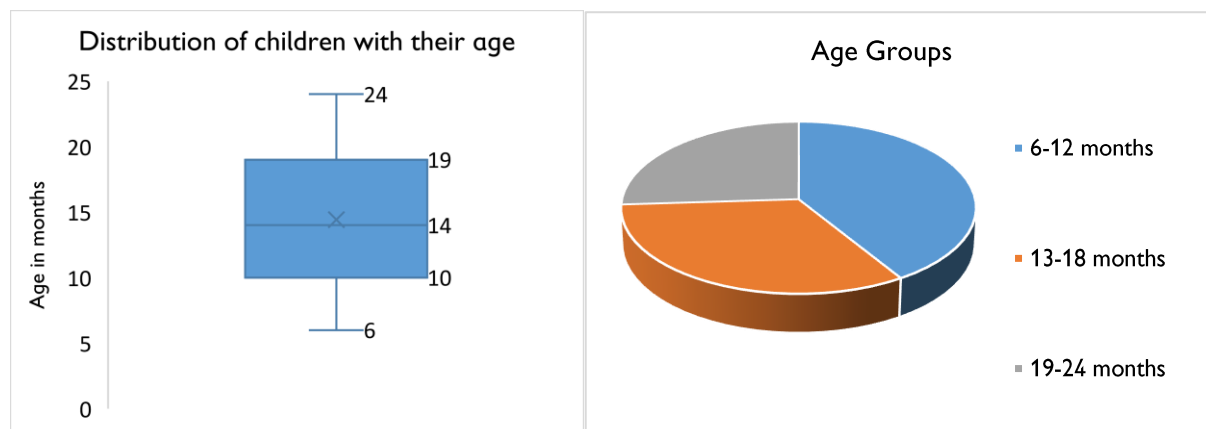
Household survey data was collected on Kobo collect application on a handheld device (Android Based Tablet). The data from each of the tablets was collated on this platform. The collated data was then exported to SPSS (ver. 22) for cleaning and analysis. Various associations were then established between the coverage of interventions with each other. Some of the key findings are as follows:

Results & Discussion

Sample characteristics:

912 children between 6-24 months were sampled for the study. The median age was 14 months with an interquartile range of 9 months.

Of all the respondents having children in the age group of 6 months to 24 months, 41% were from the age bracket of 6 to 12 months. 33% in age group of 13-18 months while 26% were from age group on 19 to 24 months.



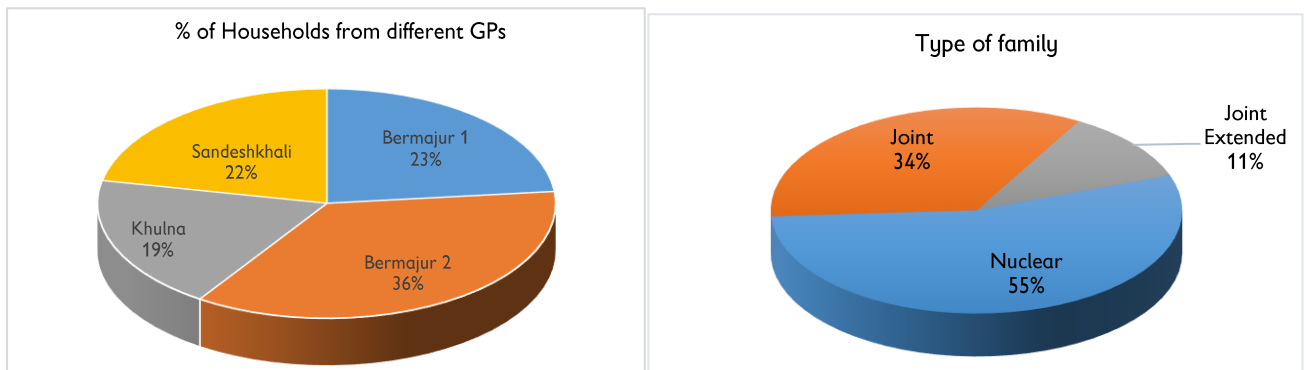
Monthly income from all members of the households including remittances was captured and half of the sampled households are in the poorest quartile. The monthly average income of the sampled

households is 4225. The table below provides the income distribution of sampled households in four quartiles.

Income Group (monthly income in INR)	N	%	Mean	Median	Min	Max	Std Dev	95% confidence	
								Lower	Upper
Poorest	448	49.1	2652.7	3000	400	3000	577.6	45.8	52.3
Lower middle	22	2.4	3500.0	3500	3500	3500	0.0	1.4	3.4
Upper Middle	267	29.3	4518.0	5000	3600	5000	505.4	26.3	32.2
Richest	175	19.2	7897.1	7000	5500	30000	3290.7	16.6	21.7
All	912	100	4225.5	3500	400	30000	2480.0	-	-

Distribution of sampled households:

In terms of distribution of survey households with respect to the gram panchayats, maximum number of household (36%) are from Bermajur-1, 23% are from Bermajur-2, 22% are from Sandeshkhali and 19% are from Khulna

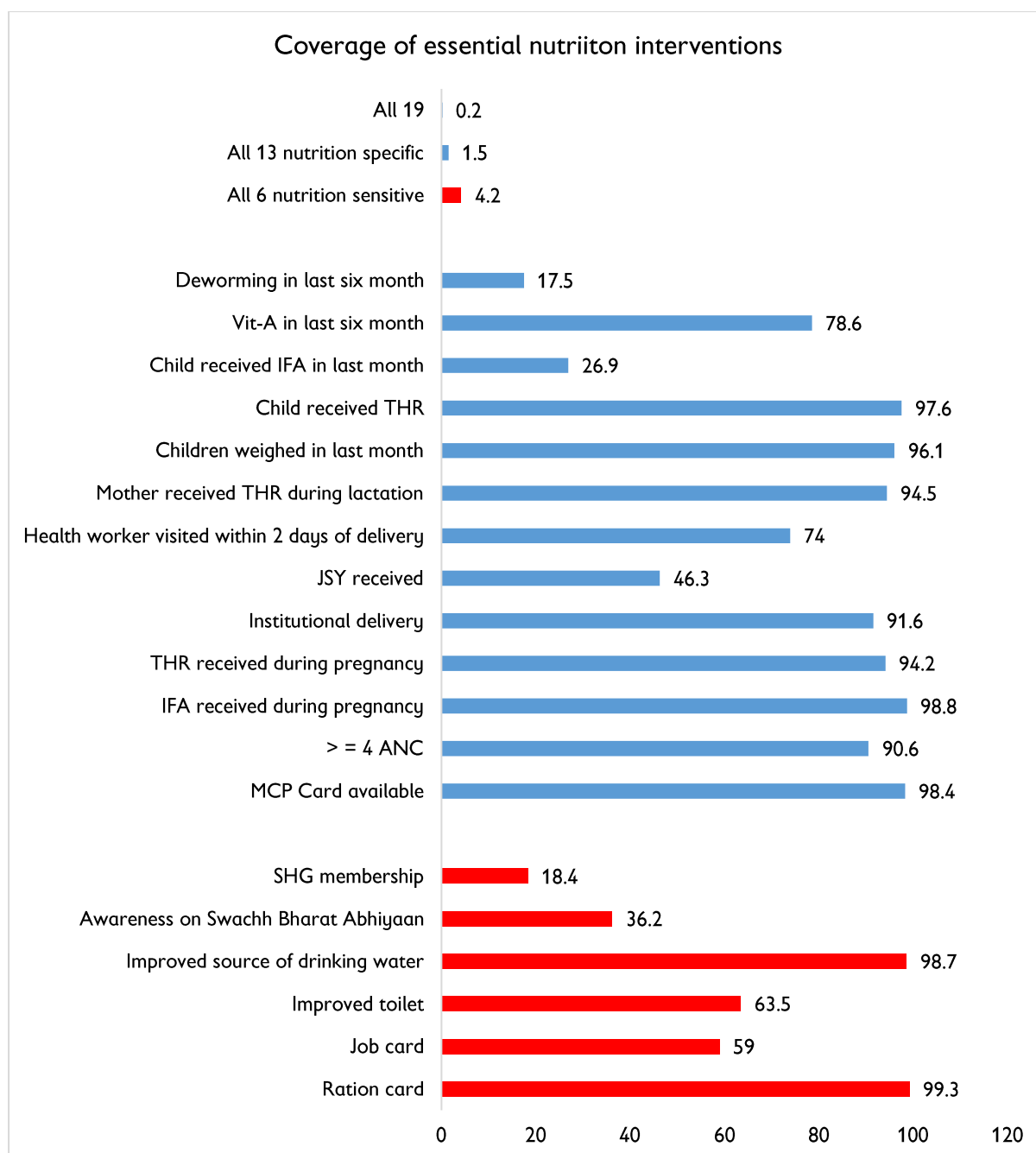


More than half (55%) of the families are nuclear, 34% are Joint families whereas just 11% are Extended Joint families.

Coverage of Nutrition Interventions:

An analysis of the coverage of nutrition sensitive interventions and nutrition specific interventions at household levels indicates abysmally low coverage (1.5%) of all 13 nutrition specific interventions. Whereas coverage of six nutrition sensitive interventions was found to be 4.2%.

If we consider coverage of both nutrition sensitive and specific interventions that comprises of 19 interventions under the study, it was found to be almost non-existent (0.2%).



Coverage of Key Nutrition Sensitive Interventions:

In addition to nutrition-specific interventions, acceleration of progress in nutrition also requires increases in the nutritional outcomes of effective, largescale, nutrition-sensitive development programmesⁱⁱⁱ. Nutrition-sensitive programmes address key underlying determinants of nutrition—such as poverty, food development, and schooling confirms that programmes in these sectors are successful at addressing several of the underlying determinants of nutrition, but evidence of their nutritional effect is still scarce. Therefore, the study ventured into this less explored area and has come out with the following observations:

Considering the above underlying determinants, 64% of the sampled households have improved toilet facilities whereas almost all (99%) households are using drinking water from an improved source (hand pump). However, only 36.2% of the mothers are aware about the benefits of Nirmal Bangla

scheme (State adaption of Swachh Bharat Abhiyaan). Almost all households (99%) have a ration card whereas 59% of them have a family member possessing a MNREGA job card. While half of the mothers are aware about the benefits of being a member of Self Help Group (SHG), only 18.4% of the mothers are member of the same, at the time of the survey.

Coverage of Key Nutrition Specific Interventions:

Undernutrition (foetal growth restriction, suboptimum breastfeeding, stunting, wasting, and deficiencies of vitamin A and zinc) causes 45% of all deaths of children younger than 5 years, representing more than 3 million deaths each year in the world ⁱⁱⁱ. Continued investment in nutrition-specific interventions and delivery strategies to reach poor segments of the population at greatest risk can make a substantial difference. Mindful of the paramount significance of nutrition specific interventions for alleviating malnutrition, the study focussed on 13 nutrition specific indicators. The observations have been clubbed together into three categories that are specific to a) Mothers and b) Children.

a) Mother Specific Interventions:

Recent evidence reinforces the importance of the nutritional status of women at the time of conception and during pregnancy, both for the health of the mother and for ensuring healthy foetal growth and development. 32 million babies are born small-for-gestational-age (SGA) annually—representing 27% of all births in LMICs. Foetal growth restriction causes more than 800 000 deaths each year in the first month of life—more than a quarter of all new-born deaths.^{iv} Iron and calcium deficiencies contribute substantially to maternal deaths. Anaemia is a risk factor for maternal deaths, probably because of haemorrhage, the leading cause of maternal deaths (23% of total deaths). Additionally there is now sound evidence that calcium deficiency increases the risk of pre-eclampsia, currently the second leading cause of maternal death (19% of total deaths). Thus, addressing deficiencies of these two minerals could result in substantial reduction of maternal deaths. Neonates with foetal growth restriction are also at substantially increased risk of being stunted at 24 months and of development of some types of non-communicable diseases in adulthood.ⁱⁱⁱ

The findings of our study shows that more than 90% of all mothers provided a positive response about receiving more than 4 ante natal checks (91%), 180 IFA tablets (99%) and Take Home Ration (94%) during their last pregnancy. Almost all mothers (98%) sampled for the survey had MCP/ Immunization card.

Though there is a high rate of 92% for institutional deliveries and health worker visit within 2 days of deliver, yet less than half (46%) of the mothers received JSY funds after delivery.

b) Children Specific interventions:

Good nutrition early in life is also essential for children to attain their developmental potential; however, poor nutrition often coincides with other developmental risks, in particular inadequate stimulation during early childhood.²

The findings of our study shows that there is a high proportion (89%) of new-borns who were weighed at birth, which signifies the effectiveness of the health system.

Deficiencies of essential vitamins and minerals are widespread and have substantial adverse effects on child survival and developmentⁱⁱⁱ. Deficiencies of vitamin A and zinc adversely affect child health and survival, and deficiencies of iodine and iron, together with stunting, contribute to children not reaching their developmental potential.

The provision of services immediately after the delivery at the facilities is satisfactory as can be inferred from the data above. The provision of supplies to newborn and children declines with the passage of time. For instance, only 12% of the children up to the age of 24 months received deworming tablets (Albendazole), 27% received Iron Folic acid supplementation and 65% received Vitamin A supplementation.

Nutrition sensitive interventions improve the access to nutrition specific interventions

Nutrition sensitive interventions not only address the underlying determinants of nutrition it also improves the coverage of nutrition specific interventions. A Fisher's Exact test of independence was conducted between two categorical factors such as access to all six nutrition sensitive interventions and access to all 13 nutrition specific interventions. As suspected, there was a statistically significant association between access to all six sensitive services and access to all 13 specific services, $\chi^2(1) = 46.1, p < .005$. The association was moderately strong, $\phi = 0.225, p < .005$.

Awareness of Swachh Bharat Abhiyaan scheme improves the access to improved sanitation facilities

Swachh Bharat Abhiyaan has strong components related to social awareness and there are adequate efforts towards improving the sanitation aspects. A chi-square test of independence was conducted between awareness of Swachh Bharat Abhiyaan (Nirmal Bangla) schemes and access to improved toilets. There was a statistically significant association between awareness of Swachh Bharat Abhiyaan schemes and access to improved toilets, $\chi^2(1) = 25.8, p < .005$. The association was relatively weak, $\phi = 0.168, p < .005$. Similar association was not found with access to safe drinking water.

Access to four ANCs leading to improved institutional delivery

In order to understand the association of access to "4- ANC" and JSY with institutional delivery, a chi-square test of independence was conducted between access to "4-ANC" with institutional delivery. There was a statistically significant association between institutional delivery with access to both "4- ANC" ($\chi^2(1) = 9.94, p = .002$). If the mother has availed 4-ANCs, she has 2.6 times more likelihood of delivering in an institution (OR: 2.60, 95% CI: 1.40 – 4.81, $p < .005$).

Recommendations

- The evidence generated from this study shows abysmally low availability of a package of nutrition sensitive and specific interventions at household level that is a reflection of a disjointed action on the part of various departments of the government. More than 'action', it is a manifestation of sheer 'ignorance' about cumulative gap generated by collective non-accountability of the system. This calls for adjusting our assessment lenses to household level delivery of interventions and see them as a wholesome package rather than discrete departmental deliverables.
- Large-scale National level surveys with their low frequency are not quite handy for short term tactically planning and fixing immediate accountability. There is a dearth of credible household level data, which can bring out a clear and finer picture of the availability of convergent interventions for nutrition. Hence, there is a need to put up a mechanism in place that enables the government to obtain household level coverage of interventions on local & regular basis.
- Government should come up with a framework of action, which brings together different departments in a synergistic way, and fixes shared accountabilities. Dedicated Joint Action

Committees and teams can be formed at all administrative levels in this regard. The framework should assess the effectiveness of convergent actions not only on the basis of 'process accomplishments' but on 'outcome achievements'. Collective appreciation and rewards should be ensured for Outcome level achievements.

- As the final transaction on most of the health & nutrition interventions happen at the frontline worker level, there is a need to devise innovative strategies that can inculcate a culture of mutual understanding and respect of each other's work in this cadre. Building strong team bonding can work wonders in translating the policy into actual results for delivery of convergent interventions.
- The Government, Development partners and civil society organization should explore options for special recognition and incentives to the team rendering collaborative interventions at household level those results in the targeted outcomes.
- Though much importance to convergence has been given under the flagship program of Poshan Abhiyan, yet for accelerating and sustaining the progress thus achieved will only be possible through long term strengthening of systems and programmatic capacities.
- There is also a high unmet need for operational research on delivery, implementation and scale up of successful models of convergent action to help in building a more conducive environment for program delivery. Research Institutions of eminence can collaborate and adopt different regions of the country to conduct such researches and support policy development with their contextual and credible evidence.

Annexure - Statistical table

	Estimate	95.0% Confidence Interval	
		Lower	Upper
Ration card	99.3	98.6	99.8
Job card	59.0	55.7	62.2
Improved toilet	63.5	60.3	66.6
Improved source of drinking water	98.7	97.7	99.3
Awareness on Swachh Bharat Abhiyaan (Mission Nirmal Bangla)	36.2	33.1	39.4
SHG membership	18.4	17.9	18.9
MCP Card available	98.4	97.3	99.1
> = 4 ANC	90.6	88.5	92.4
IFA received during pregnancy	98.8	97.9	99.4
THR received during pregnancy	94.2	92.5	95.6
Institutional delivery	91.6	89.6	93.3
JSY received	46.3	43.0	49.6
Health worker visited within 2 days of delivery	74.0	69.0	79.0
Mother received THR during lactation	94.5	92.8	95.9
Children weighed in last month	96.1	94.6	97.2
Child received THR	97.6	96.4	98.5
Child received IFA in last month	26.9	24.0	29.9
Vit-A in last six month	78.6	78.1	79.1
Deworming in last six month	17.5	17.0	18.0
All 6 nutrition sensitive	4.2	3.0	5.7
Any 6 nutrition sensitive	100.0	99.6	100.0
All 13 nutrition specific	1.5	0.8	2.6
Any 13 nutrition specific	100.0	99.6	100.0
All 19	0.2	0.0	0.8
Any 19	100.0	99.6	100.0
Awareness on Poshan Abhiyaan	91.0	89.0	92.8
Awareness on SHG membership	50.7	47.4	54.0
Mother received any financial assistance during lactation	4.5	3.2	6.0

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Dr. Shahab Ali Siddiqui	Manager- Health Systems Strengthening, Save the Children India
Debashmita Bhaumik	Manager - Health & Nutrition (East), Save the Children India
Dr. Antara Dhargupta	Project Coordinator-Health & Nutrition, Save the Children India

REVIEW AND INPUTS

Dr. Rajesh Khanna	Deputy Director- Health and Nutrition, Save the Children India
Chittopriyo Sadhu	Deputy Director, Program Management, Save the Children India
Susmita Guha	Senior Manager – West Bengal State Programme, Save the Children India

DATA COLLECTION AND FIELD LEVEL SUPPORT

Sujoy Chakma	Project Coordinator, DSWS
Avijit Pradhan	M&E Coordinator, DSWS
Sahabuddin Molla	Field Coordinator, DSWS
Avoy Dom	Field Coordinator, DSWS
Debendra Nath Biswas	Field Coordinator, DSWS

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