

Review Article

BRAC's experience in scaling-up MNP in Bangladesh

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Despite progress in health status and achievements in Millennium Development Indicators, Bangladesh presents a gloomy scenario for nutrition. In 2009, BRAC (formerly known as Bangladesh Rural Advancement Committee) has begun to implement a community-based approach of Alive & Thrive with Family Health International 360, aiming to reduce undernutrition among children under two by promoting exclusive breastfeeding and appropriate complementary feeding practices. To address anemia and other micronutrient deficiencies, home-fortification with micronutrient powders (MNP) has been promoted among under-fives across Bangladesh along with the Global Alliance for Improved Nutrition (GAIN). BRAC's frontline community health workers play a critical role in promoting micronutrient powders with better feeding practices. Over the years, improvements have been observed in the intervention areas: exclusive breastfeeding rose from 49% to 83% of children (0-6 months), 86% of children received complementary feeding at 6-8 months with about two-thirds being fed the recommended number of times; and 70% of children (6-59 months) adhered to MNP use, ie consumption of 1 sachet per day in the past 60 days. However, many challenges are still observed in traditional feeding practices, along with limited skills of community health workers and households' poor access to quality food, necessitating constant interactions between caregivers, mothers-in-law and fathers with the frontline workers. Maintaining the supply chain of micronutrient powders and a visible and convincing change in nutritional status of children are key success factors. The partnerships between BRAC, GAIN and Renata, the producer of MNP in Bangladesh, have given birth to a home-fortification model that can deliver impact at scale.

Key Words: infant and young child feeding, micronutrient powder, micronutrient malnutrition, home fortification, BRAC

INTRODUCTION

With a large population of an estimated 150 million in 2011,¹ Bangladesh has made impressive progress to meet a number of the UN Millennium Development Goals (MDGs) related to health and child survival indicators over the past few decades. Between 1990 and 2011, infant mortality rates declined from 92 to 43 deaths per 1000 live births, and under-five mortality dropped from 146 to 53 deaths per 1000 live births.²⁻⁴ Many of these gains have been attributed to deliberate efforts to slowdown the population growth rate, to implement an expanded programme of immunisation, promote high usage of oral rehydration therapy, vitamin A intake, breast feeding, and increased girls' education, improved gender equality and empowerment of women.⁵ Despite all these achievements, undernutrition among children below five years remains a challenge. Micronutrient malnutrition caused largely by iron, iodine, vitamin A and zinc deficiencies are common among young children and lead to poor growth, impaired cognitive development, susceptibility to infections and diminishing economic outcomes during adulthood.^{6,7} Efforts to control these micronutrient deficiencies include three approaches: dietary diversification, (staple) food fortification, including home fortification, and supplementation.⁸⁻¹⁰

Bangladesh, under the Ministry of Health & Family Welfare, provides iron supplementation to prevent anaemia

among pregnant women and occasionally among adolescent girls. NGO sectors are quite proactive in addressing the same population. Unfortunately, infants and young children were completely overlooked for years. Since 2010, with the support of the Global Alliance for Improved Nutrition (GAIN), BRAC (formerly known as Bangladesh Rural Advancement Committee), a national non-government organisation, is implementing a nationwide community-based home fortification with Micronutrient Powders (MNP) initiative in Bangladesh to improve micronutrient status and reduce anemia among children aged 6-59 months.¹¹

This paper presents BRAC's experience and achievements in scaling up a nationwide MNPs intervention for home fortification consumed by children 6-59 months of age. Built on existing evidence, the paper concludes with future directions for delivering services more effectively with maximised reach and improved outcomes.

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Childhood undernutrition in Bangladesh

A review of the nutritional status of Bangladeshi children from 1980-1990 showed that the prevalence of stunting declined from 70% to 60%.¹² A Child Nutrition Survey undertaken in 2000 showed a relative decline in the proportion of stunted children to 48%.¹³ According to the new growth standards adopted by WHO in 2006, the decline was followed by 51% in 2004 to 43% in 2007 and 41% in 2011.^{2,4} Although the prevalence of stunting has declined by nearly 30 percentage points over the years, the rate of decline is not sufficient to achieve the MDG target set at 34% by 2015.¹⁴ The wasting prevalence was more than 20% in 1980s and declined to 10% between 1999 and 2000.^{12,13} The trend then showed an alarming increase to 15% in 2004 to 17% in 2007 with a slight decline to 16% in 2011.^{2,4}

A decline was found in the prevalence of underweight from 66% in 1990 to 48% in 2000^{12,13} and 43% in 2004.² Afterwards the trend in decline slowed down, from 41% in 2007 to 36% in 2011.^{3,4} The MDG Progress Report 2009 revealed that, in line with the progress in reducing underweight among children, it is unlikely for Bangladesh to reach the MDG target of 33% by 2015.¹⁴ Unfortunately, Bangladesh still has one of the lowest average birth weights in the world.¹⁵ The prevalence of low birth weight (a birth weight <2,500 g) has been reduced from 47% between 1993 and 1996 to 36% in 2003-2004¹⁰ and recently came down to 22%.^{15,16}

Childhood anaemia

Childhood anaemia is an alarming issue for Bangladesh. The first National Anaemia Prevalence Survey 2004¹⁷ showed that the overall prevalence of anaemia (hemoglobin concentration <110 g/L) amongst the children under the age of five was 49% (urban areas 56% and rural areas 47%). The result of the Bangladesh Demographic and Health Survey 2011 reinforced the findings, showing that 51% of children aged 6-23 months are suffering from anaemia.⁴ However, the latest National Micronutrients Status Survey 2011-12 reported a much lower prevalence of anaemia ie about 33% amongst pre-school age children (6-59 months).¹⁸ This might be attributed to the differences in assessment methods in the two surveys. In all the studies, the prevalence appeared to be higher amongst under-two children and declined with age.

BRAC'S history in nutrition

Born in Bangladesh, BRAC – the largest non-governmental organisation (NGO), spreads solutions to ten other countries around the world in creating opportunity for the poor. It started out with a limited relief operation in 1972 in a remote village of Bangladesh and subsequently broadened focus to sustainable development. Using communities' human and material resources, BRAC catalyses lasting change in which the poor realise their potentials. With a holistic development approach, BRAC is geared toward inclusion, using tools like micro-finance, education, health-care, legal services, community empowerment, social enterprises and BRAC University. It now touches the lives of an estimated 135 million people, with staff and BRAC-trained entrepreneurs numbering in the hundreds of thousands, a global movement

bringing change to 11 countries in Asia, Africa and the Caribbean.²⁰⁻²²

For the last 40 years, BRAC experimented with a series of nutrition interventions in various parts of Bangladesh. Most notable was a partnership with the Government of Bangladesh to implement nutrition interventions to reduce low birth weight and undernutrition of under-two children.³ The success of BRAC's community-based pilot nutrition programme provided the basis for initiating nutrition interventions at national level. In 2007, BRAC partnered with International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) to develop a strategy of Mainstreaming Nutrition Initiative (MNI) by integrating a package of maternal and child nutrition interventions in its Maternal, Neonatal and Child Health Programme (MNCH) platform.²⁴ To improve infant and young child nutrition (IYCN) and address high rates of anaemia, in recent years BRAC is implementing two community based interventions – namely, "Alive & Thrive" and the "Bangladesh Sprinkles Program".

Alive & thrive: a community based approach for IYCF

Pushed by the evidence published in the *Lancet Series* on Maternal and Child Undernutrition 2008²⁵⁻²⁷ and supported by the Bill & Melinda Gates Foundation, in mid-2009, "Alive & Thrive" has begun with a pilot under the leadership of Family Health International 360 to develop a scaled-up model in Bangladesh for preventing avoidable deaths, illness and undernutrition caused by sub optimal infant & young child feeding (IYCF).²⁸ Based on BRAC's health care platform, Alive & Thrive provides some lessons, especially how to promote home based food practices for infant and young child, through community health workers. BRAC's frontline health workers, known as *Shasthya Shebika*, *Shasthya Kormi* and *Pushti Kormi* (IYCF Promoter), offer targeted counselling and hands-on coaching and demonstrations to mothers and caregivers of children 0-23 months of age during regular home visits, antenatal and postnatal care visits, and health forums to promote early and exclusive breastfeeding, adequate and age appropriate complementary feeding and hygiene practices. BRAC also facilitates social mobilisation activities among key community stakeholder groups and pursues their commitment to take actions in support of the interventions. In addressing the 1,000-days window, the experience and evidence of Alive & Thrive has gradually been integrated in BRAC's MNCH platform. Today, more than 5 million under-two children are being reached in over 200 sub-districts of Bangladesh through BRAC's IYCF intervention funded by UK Government's Department for International Development and Australian Government's Department of Foreign Affairs and Trade.^{28,29}

Bangladesh sprinkles program: home fortification with micronutrient powder

Home fortification of foods with multiple micronutrient powder, along with the promotion of age specific home-based complementary feeding, is an effective intervention to address childhood iron deficiency anemia.³⁰⁻³² In response to this global evidence, BRAC partnered with GAIN in 2010 to implement a large scale community-

based home fortification programme named “Bangladesh Sprinkles Program” through selling and distributing MNPs amongst children aged 6-59 months. Renata, one of the leading pharmaceutical companies in Bangladesh, is involved in the manufacturing of a 5-ingredient micro-nutrient powder (branded as *Pushtikona*) that contains iron, folic acid, zinc and vitamins A and C.³³ Currently, BRAC is distributing MNPs in 61 districts (463 sub-districts) of Bangladesh through its community health workers. However, the intervention is implemented in a more intensive way in 50 Alive & Thrive sub-districts with complementary feeding practices. The International Food Policy Research Institute (IFPRI) is involved in evaluating this community-based approach in delivering MNP and the product's effectiveness to control anaemia amongst children aged 6-59 months. BRAC also tracks the project progress against targets, through quarterly monitoring study.

MATERIALS AND METHODS

Along with a literature and documents review pertaining to MNP interventions, this paper is based on data collected from different sources, including Alive & Thrive periodic monitoring surveys, and a Process Evaluation Survey and Rapid Qualitative Assessment of BRAC's MNP intervention 2013, done by IFPRI. A small study, done by a master student at James P Grant School of Public Health of BRAC University on adherence to micronutrient powder among children aged 6-59 months in rural Bangladesh, was also reviewed to understand the outcomes of the intervention.

RESULTS

The recent Process Evaluation Survey, 2013 done by IFPRI,³⁴ presented in Figure 1 shows an improvement in IYCF practices over the years in Alive & Thrive intervention areas in Bangladesh. Between 2010 and 2013, the rate of exclusive breastfeeding has increased from 49% to about 83% among children under 6 months, timely initiation of complementary feeding at the age of 6-8 months rose dramatically, from about 46% to 86%. Nearly 62% of children age 6-23 months received a diverse diet. With

respect to minimum meal frequency, about 68% of children were fed the recommended number of times with complementary foods.

Increased sales and distribution of MNP using BRAC's network

In 2008, Renata started to produce a MNP product branded as “Moni Mix” that was distributed through the Social Marketing Company (SMC). Renata also established a retail distribution channel for MNP through its network of pharmacies, physicians and sales representatives (Figure 2). However, the sales increased rapidly when Renata and BRAC formed a partnership with the support from GAIN in 2010.³³ Currently, BRAC deliver over 1.3 million sachets of MNP per month. In 2013, Renata produced nearly 34 million sachets of MNP, of which about 14.5 million sachets were distributed through delivery networks of BRAC's *Shasthya Shebikas*.

Knowledge and purchasing pattern of MNP

The results of IFPRI's Process Evaluation Survey 2013³⁴ also showed that knowledge and purchasing patterns of MNP among mothers were better in Alive & Thrive intensive and MNP areas than only MNP intervention areas. The findings showed that nearly 68% of mothers had the appropriate knowledge on MNP whereas only 51% of them purchased it for their children (Figure 3). Data suggests that integration of the MNP component with complementary feeding messages is the key for this achievement in Alive & Thrive with MNP areas. Increase in purchase of MNP could also be attributed to more contacts between households and frontline health workers in Alive & Thrive areas with more comprehensive counselling, coaching and demonstration and performance based incentives for *Shasthya Shebikas* that enhance their mobility.³⁴

Adherence to MNP

A small study was conducted in sub-districts where Alive & Thrive and MNP were combined. It is reported that adherence (ie, the consumption of 1 MNP sachet per day in the past 60 days) was the operational definition in the

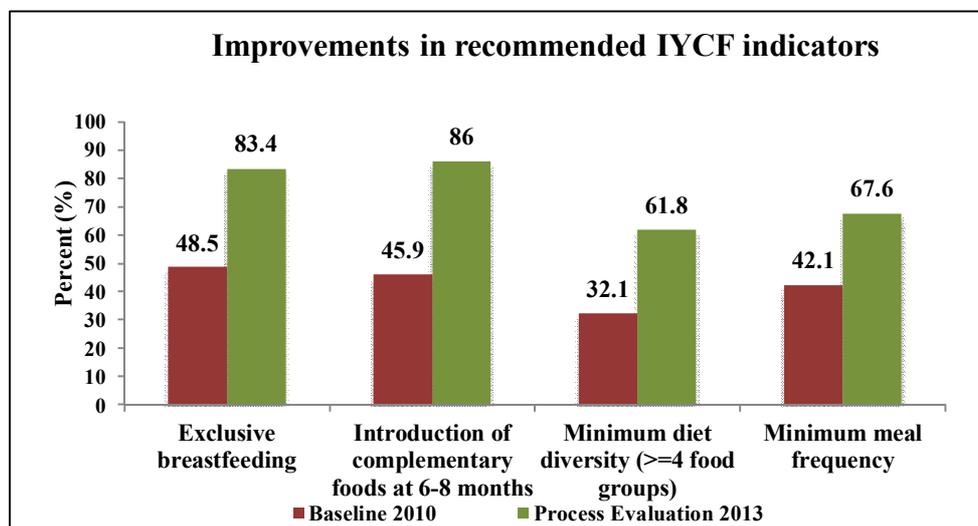


Figure 1. Improvements in IYCF indicators. Data from references 34

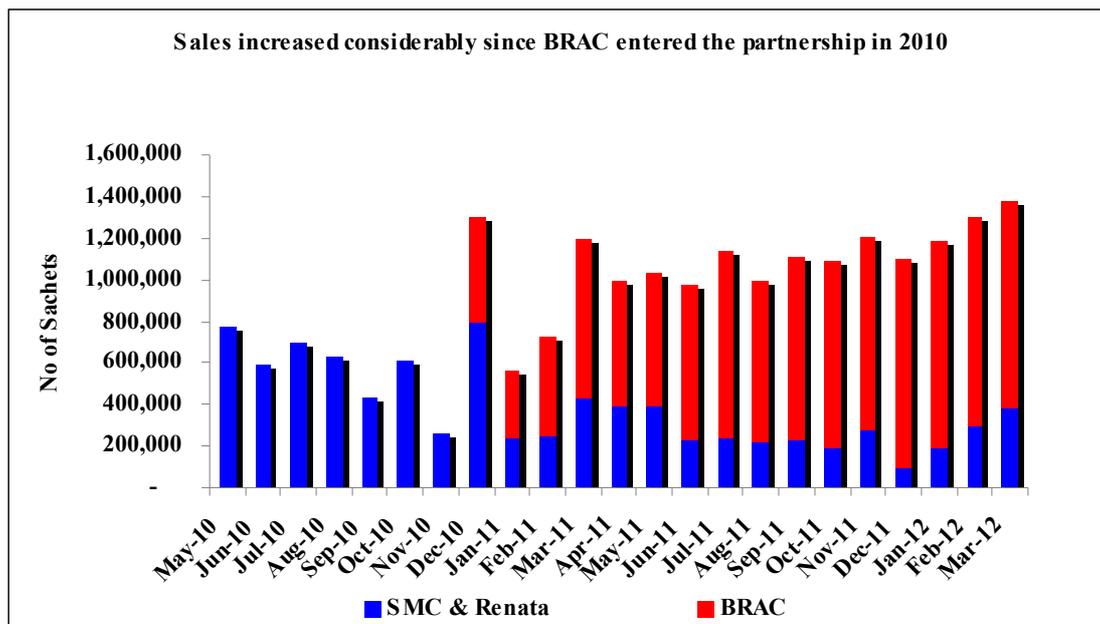


Figure 2. Sales and distribution trends of MNP. Data from references 33

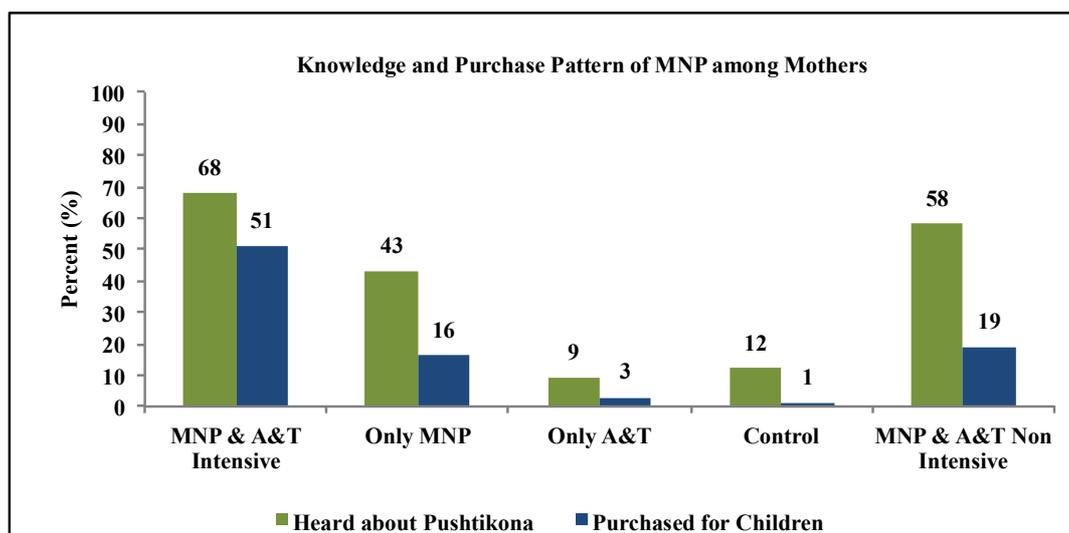


Figure 3. Knowledge and purchasing patterns of MNP among mothers. Data from references 34

study) to MNP was higher among children aged 6-23 months with a mean of 70%.³⁵ This is elucidated from the fact that once children begin to take MNP, they continue to adhere if combined with well-supervised IYCF practices.

DISCUSSION

Many factors explain BRAC’s success in implementing a large scale home food fortification programme – a countrywide network of frontline community health workers, effective behaviour change communication, different social sanction activities, and involvement of multiple partners.

Countrywide distribution network

An existing network of 97,000 frontline community health workers or *Shasthya Shebikas* employed to provide health and nutrition counselling and to sell MNP

door-to-door at an affordable price, along with other products, such as oral rehydration saline (ORS), iodised salt, sanitary napkins, etc. Renata delivers MNP directly to the BRAC central warehouse at Dhaka. It is then dispatched to regional offices at district level. From there, it is distributed to sub-district level offices and branch offices, on a monthly basis. BRAC’s *Shasthya Shebikas* buy each box (containing 30 sachets) of MNP from the respective branch offices at a subsidized price and sell it to the caregivers of the targeted children in the community during their home visit. Dosage is given following WHO recommendations and BRAC health workers monitor protocols and compliance.

A multi-tiered distribution channel with an emphasis on access for the poor

The children living in extreme poor households are roughly 20% more likely to be anaemic than are those in

the upper wealth quintile.³⁸ In 2012, BRAC distributed 16 percent of its total sales of MNP to the children of ultra-poor households at free of cost to maximise access and meet their needs.

Behaviour change communication (BCC)

BRAC has created a community-based micro-franchising system for demand generation and promoting healthy behaviour and acceptance of the products at household level.³⁸ MNP is a new product for the households. Various studies showed that there were many myths and misconceptions associated with this product. To drive appropriate and consistent use of MNP, BRAC follows an integrated approach with complementary feeding practices for mothers and caregivers with a demonstration on the use of the product at the beginning of the 7th month and correct procedures for food preparation.

Social sanction activities to pursue support for good feeding practices

In the Bangladesh context, feeding a child is not only a mother's decision. In most of the cases, the actions and influence of family and household members ultimately determine what and how a baby is being fed. Although in a family, father and in-laws commonly control and influence the household expenditure as well as many other decisions, they are often unconscious of the role they could play in child feeding. BRAC has therefore been supporting many social sanction activities eg social mobilisation forums with government and non-government officers, political and religious leaders, health officials, alternative health care providers, teachers, adolescents and fathers to get buy-in and ownership of the product by key decision makers at household and society level. Making these practices the social norm will make it easier for mothers and caregivers to adopt and sustain healthy IYCF practices.

Involvement of multiple partners

The synergy of multiple partners outweighs occasional difficulties faced in partnership. Exchanging knowledge and sharing tasks, especially, GAIN mobilising financial resources and providing technical support, BRAC designing and implementing interventions and Renata Ltd maintaining supply of MNP, have given birth to a partnership model of delegating responsibility to jointly carry out the activities more effectively. On the other hand, convening meetings with multiple partners, building up mutual consensus, the official procedures of different organizations and interdependence occasionally slow down the implementation process. However, over a few years, this partnership model in fact has gradually been developing an unconscious integrated model that allows each organisation the flexibility to use the exact functionalities that match their specific needs and objectives.

LESSONS AND THE WAY FORWARD

During the period of implementation, BRAC has identified the barriers to achieving optimal usage and compliance of MNP. A few reasons are identified.

1) Limited awareness of caregivers

Lack of knowledge prevails among mothers and caregivers on benefits of MNPs that can protect infants and young children from micronutrient deficiency, especially anaemia. Healthy, full-term babies are usually born with enough iron stores to meet their needs for about the first six months, thereafter iron needs to come from complementary foods in addition to breast milk. However, the quality, quantity and frequency of complementary foods given to infants and young children in Bangladesh are often inadequate to meet their increasing iron requirements. Even a good number of children from wealthier quintiles do not regularly consume sufficient quantities of iron-rich food, including animal foods - the best dietary sources of iron.⁴ To overcome this situation, it is essential to generate acceptance and demand through escalating knowledge levels (regarding benefits and usage), reducing misconceptions and increasing endorsement for MNP at household and community levels.

2) Household level compliance

Household level consumption of adequate dosage of MNP and compliance (ie a child must be given a minimum of 60 single-dose sachets with no more than one sachet a day over 60-120 days. A dose of 60 sachets should be maintained every 6 months for children 6-59 months until a child's hemoglobin levels above the cut-off for anaemia) have remained important challenges. BRAC has been building capacities of the *Shasthya Shebikas* for regular home contact and interpersonal counselling to address better compliance and consumption of the product. At the household level, intra-household disparities and gender issues also play a dominant role in buying behaviour and compliance.

Directions for the future

Recently, the BRAC MNP programme has entered into its second phase with more emphasis on behaviour change communication and compliance mechanisms that involve introduction of performance based incentives for *Shasthya Shebikas* and distribution of calendars to mothers to track everyday consumption. The existing community based MNP delivery model and compliance figures point towards a limited reach with a high impact in areas having existing programmes, by leveraging existing resources and network of BRAC frontline community health workers. Experience suggests that, to improve and realise the full potential of existing BRAC community-based model of MNP, few approaches are urgent. Firstly, strong demand side intervention with a focus on public accountability, continued advocacy and political commitment are required to ensure an enabling environment in the community. Considering the socio-cultural context, effective promotional activities and BCC strategies linked with the existing programme platforms and network of BRAC's frontline community, health workers are essential to stimulate not only the uptake of MNP but also its appropriate usage and compliance. Secondly, supply side aspects, including incentives for frontline health workers, and affordable pricing structure should be emphasised to keep the product within the reach of the target population. Thirdly, uninterrupted flow of MNP to the community has to be maintained. Fourthly, an improvement in the

monitoring and evaluation system should be incorporated to document coverage, compliance and impact of MNP intervention. To produce sustained high reach and deep impact, cost-effective nationwide rollout of MNP is necessary especially with a stronger focus on government, NGO and private sector partnership and on cultural 'norm' building in home-based food and feeding practices for children.

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AUTHOR DISCLOSURES

The Authors declare no conflict of interest in the manuscript.

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孟加拉農村發展委員會擴大規模使用微量營養素粉的經驗

儘管健康狀況的進步及千禧年發展指標的成就，孟加拉對於營養仍呈現悲觀的情境。從 2009 年，孟加拉農村發展委員會（BRAC）開始執行一個社區型的 Alive & Thrive with Family Health International 360 計畫，旨在藉由推廣全母乳哺育及餵食適當的副食品，進而降低兩歲以下兒童的營養不良。為了解決貧血及其他微量營養素缺乏，針對有五歲以下兒童的家庭，整個孟加拉與全球營養改善聯盟（GAIN）採用家庭強化微量營養素粉（MNP）。在推動微量營養素粉以達最佳的餵食方法，BRAC 的第一線社區健康工作人員扮演重要的角色。多年來，在介入地區已可看到改善：兒童（0-6 個月）的全母乳哺育由 49% 上升至 83%；86% 的兒童在 6-8 個月時開始吃副食品，其中約有 2/3 餵食達建議次數；70% 的兒童（6-59 個月）遵守 MNP 的使用，意即在過去 60 天，每天攝取一包。然而，由於社區健康工作人員的技巧有限，加上家戶難以獲得有品質的食物，傳統餵食方法仍然面臨許多挑戰。因此照護者、婆婆/岳母和公公/岳父和第一線工作者間需要持續的互動。維持微量營養素粉的供應鏈，以及兒童營養狀況有看得見且具說服力的改變，將會是成功的關鍵。BRAC、GAIN 及孟加拉微量營養素粉的生產者 Renata 間的伙伴關係，讓家庭強化模式得以產生並發揮巨大的影響力。

關鍵字：嬰幼兒餵食、微量營養素粉、微量營養素營養不良、家庭用強化、孟加拉農村發展委員會