



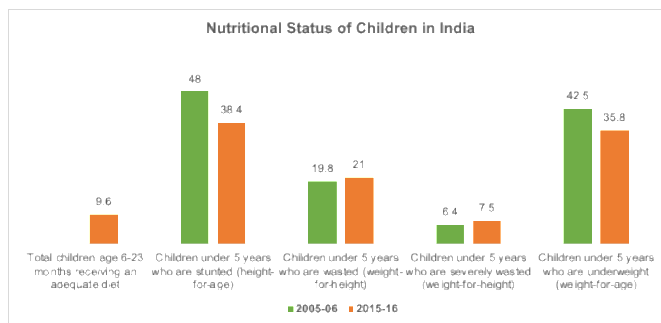
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Exploring nutrition initiatives in India with a focus on a Community Based Approach (CMAM) for Severe Acute Malnutrition (SAM)

Good nutrition has the power to build strong communities and spark joy in the future of a nation – its children. Nutritious food serves as the foundation to all aspects of life, ensuring sound physical and mental development. The effort is to allow children access to clean good nutrition irrespective of social or economic status.

Data shows that there has been an improvement in the nutritional status of children in the country over the last ten years. There has however, been a rise in the percentage of children who are severely wasted.

The Government has accorded high priority to the issue of malnutrition and is implementing schemes/programmes to address various aspects related to nutrition. While the POSHAN Abhiyan is the Government’s flagship scheme, there are also more targeted efforts, including Management of children with Severe Acute Malnutrition (SAM). A first step has been the development of Facility Based Guidelines and the setting up Nutritional Rehabilitation Centres.



Source: NFHS 4

However, it has been felt that considering the burden of Severely Acute Malnutrition (SAM) in India, a Community based approach is an integral part. A Community Based Approach (CMAM) is an integrated approach involving timely detection, provision of treatment as well as community mobilization. Further, CMAM has the potential to create a long-term community-based therapeutic care programme, decentralize malnutrition care and treatment, increases coverage and ensures that timely and appropriate care is easily accessible. While critics may argue that case load of wasting and in particular SAM is small, it must be noted that research shows that SAM children are 11.6 times more at higher



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risk to die early as compared to normal children, from a condition, which is easily treatable, and preventable¹.

A snapshot of CMAM efforts in India



Positive and Optimum care of children through a Social Household Approach for Nutrition' (POSHAN) project implementing of Community-based Management of Acute Malnutrition (CMAM) in Rajasthan

The Context

Considering the higher risk of mortality among children with SAM, the State felt the need for reaching out to these children through a community based approach, especially for those children who do not have medical complications.

The Program

A total of 9640 children were enrolled and treated under POSHAN – 1 (Phase 1 – December 2015 – June 2016). Strategies deployed – screening and identification of children with SAM at the village level, screening at Sub – center level for CMAM program, treatment protocols at the community level, provision of medical nutrition therapy, home visits etc.

The Results

Phase 1

	Sphere Standards	Rajasthan
Recovery Rate (cured)	>75%	94.57%
Death Rate	<10%	0.44%
Default Rate	<15%	2.46%
Non Recovered		2.84%

Further, INR 11,584/- per child as per the cost analysis done by R4D (commissioned by NHM).

Based on recovery criteria of MUAC ≥ 12.5 cm, just about 13%, recovered from SAM in just 4 weeks and about 88% children recovered from SAM between 8-12 weeks of sustained intervention.

An independent validation in June 2016 carried out by individuals external to the project implementing team; covering 10% of the total enrolled children, after 4 months of follow up; showed that about 95% children retained gain in weight and only about 5% children slipped back into severe acute malnutrition.

¹ Khara T, Dolan C. Technical briefing paper: The relationship between wasting and stunting, policy, programming and research implications. Emergency Nutrition Network [homepage on the Internet].2014. c2015.



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The Learnings

- The recovery rates of the POSHAN project in Rajasthan, as stated above were found to be better than yardsticks used for good performance and better than the global standard. However, the results indicate that investing in active feeding and caring for children should be continued for upto 10-12 weeks for sustained recovery and rehabilitation.
- Project has enjoyed a high visibility. Policy-makers from different States visited Rajasthan to learn how the project was conceptualized and implemented. The project has had a ripple effect in several states where similar projects are being planned.
- The project is backed by a high commitment at the policy and political level, with the Honorable Chief Minister having announced support to CMAM in the State in the 2015-16 and 2016-17 budget speeches.
- Strong political commitment, Bureaucratic wisdom to adopt a strategy similar to DOTS used in the treatment of Tuberculosis, Strong and committed partnerships, Effective management focusing on 'Transparency' and 'Efficiency', Rigorous follow-up and continuing education and engagement with the field Staff.



Community-based management of severe acute malnutrition in India: new evidence from Bihar

Sakib Burza, Raman Mahajan, Elisa Marino, Temmy Sunyoto, Chandra Shandilya, Mohammad Tabrez, Kabita Kumari, Prince Mathew, Amar Jha, Nuria Salse, and Kripa Nath Mishra

The Context

After widespread flooding in Bihar, Medecins Sans Frontieres (MSF) conducted a household-based survey in Darbhanga, which is a district of 3.9 million people and one of the poorest in Bihar. The survey showed that the prevalence of wasting and SAM in children age, <5 years was 19.4% and 4.8%, respectively.

The Program

Under a memorandum of understanding with the district authorities and, thereafter, consent from the Bihar State Health Society, in February 2009, MSF initiated a CMAM program in Biraul block, Darbhanga district. An observational, retrospective cohort study to assess key programmatic variables and clinical outcomes of India's first (as per author knowledge) conventional setting CMAM program, which treated 8274 children between February 2009 and September 2011.

The Results

A total of 8274 children were admitted including 5149 girls (62.2%), 6613 children aged 6–23 months (79.9%), and 87.3% children who belonged to Scheduled Caste, Scheduled Tribe, or Other Backward Caste families or households. Of 3873 children admitted under the old criteria, 41 children (1.1%) died, 2069 children (53.4%) were discharged as cured, and 1485 children (38.3%) defaulted.

CMAM was an effective strategy, which led to cures for 88.4% of children who completed the treatment although hindered by substantial default.



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The Learnings

- As home to nearly one-third of the world's children with SAM, India's approach to treating SAM has relied almost exclusively on inpatient care, whereas the community-based approaches shown to be effective and feasible in African settings have not been well tested, studied, or implemented in India. This study, implemented in one of the poorest districts of Bihar, points to the fact that CMAM was an effective strategy, which led to cures for 88.4% of children who completed the treatment although hindered by substantial default.
- Further, a cost-effectiveness analysis that compares routine CMAM projects with the current hospital-based model of care would be a useful next step in providing policy makers more evidence for future planning strategies.
- Because of the high burden of SAM seen in India, the current strategy of inpatient treatment programs alone is unlikely to provide care for all of these SAM children at higher risk of death. A 2012 study of 93 children treated in the state of Madhya Pradesh concluded that, although the compulsory 14-day inpatient stay succeeded in improving the condition of admitted children, the improvement was not sustained after discharge. Perhaps more crucial was the supposition that even if all 175 dedicated inpatient nutritional facilities were running at full capacity, it would take 15.5 year to provide this treatment method to the 1.3 million children in the state suffering from SAM.



CMAM efforts in Jharkhand and Bokaro CMAM Project

A. C – MAM Programme Context *(to be further validated)*

Jharkhand has very high prevalence of severe wasting with a state average of 11.4%. The state has 87 Malnutrition Treatment centers (MTCs) with bed capacity of 93, which is not adequate to address the issue. Many children lose out to treatment as they are not able to access facility based care.

The pilot intervention covered one tribal block with an aim to establish the required systems that can be scaled up for an integrated programme for prevention and treatment of acute malnutrition. The programme aimed at a coverage of atleast 60% with a cure rate >75% and mortality rate below 5%.

The Results

Of the total 4632 children below five years, 4519 were screened and over 484 were referred to primary OTP for further confirmation.

The Learnings

- Jharkhand has taken an approach to address SAM, through its unique programme 'Jeevan Asha'. Stakeholders have pointed to the fact that while using the 'Ready to Use Therapeutic Food' (RUTF) for SAM management, the government also included other complementary strategies like the WASH (Water, Sanitation and Hygiene).
- Jharkhand Nutrition Mission witnessed a good synergy between health and ICDS and has initiated the process for the launch of CMAM program



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- Considering the accessibility, coverage and requirements, there is an urgent need for a community based programme for malnutrition where different kinds of malnutrition are addressed. Such a programme would also mean that SAM children without any medical complications can be treated in the community settings. In turn, such an approach would free up scarce institutional resources for more intensive care for sick SAM children, who need such care.

B. Bokaro Pilot – The context

The Indian State of Jharkhand recently joined the Scaling Up Nutrition (SUN) Movement; one of three in India to do so. India's national survey data (for 2015-2016) reported 21% prevalence of global acute malnutrition (GAM) (weight-for-height z-score (WHZ) <-2 SD), with 29% GAM and 11.4% severe acute malnutrition (SAM) reported in the State. A baseline survey conducted in March 2016 of World Vision (WV) India programming areas in the Bokaro district of Jharkhand reported 28% GAM (WHZ<-2SD) in children aged 6-59 months.

The Program

At the request of the Jharkhand State Nutrition Mission, WV India commenced a pilot outpatient SAM treatment programme (outpatient therapeutic programme (OTP) through the Integrated Child Development Scheme (ICDS) in Bokaro district, the first of its kind in Jharkhand. The implementation approach in this context used the existing ICDS structure, setting up OTP sites for uncomplicated SAM cases at selected AWCs. Cases of SAM with complications were referred to inpatient facilities at government-run Malnutrition Treatment Centres (MTCs). Within Bokaro, one MTC centre covers three blocks. The pilot project targeted two blocks within Bokaro district; initially Chandankiyari and later expansion to Chas (population 230,238 and 813,402 respectively, as per 2011 census). The purpose of the pilot was to explore the feasibility of using the ICDS system to provide outpatient SAM treatment and documenting lessons learned to inform future policy and programming. The pilot ran from January to September 2017.

The Results

Discharge Category	Bokaro CMAM Project
Cured/Recovered	61%
Died	0%
Defaulted	39%
Non Recovered	0%
Referral to MTC	22%

The Learnings

- The project was viewed as appropriate by local stakeholders and in line with local needs. Malnutrition was identified as a significant problem, with the barriers to accessing treatment through MTC acknowledged by all stakeholders.
- The pilot also demonstrated that it is feasible to implement outpatient treatment for SAM through the ICDS system. The decentralised structure of the AWCs provide highly accessible service for communities and the AWWs report it is feasible to include outpatient management of SAM within their existing role. However, the current ICDS system cannot deliver OTP services without external support for capacity-strengthening.
- An external partner is needed to provide overall coordination, capacity-building, technical oversight and monitoring/evaluation support.



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- If outpatient care for SAM is endorsed by the State and an enabling environment is created for implementation, local capacity can be developed with a view to providing outpatient treatment for SAM as part of routine government services.

Efficacy of three feeding regimens for home-based management of children with uncomplicated severe acute malnutrition: a randomised trial in India

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The Context

Home-based management after initial hospitalisation was proposed for children with SAM as an effective strategy to increase coverage. This was supported by the development of ready-to-use therapeutic food (RUTF). Studies in Africa showed that, for homebased management of uncomplicated SAM, RUTF achieved recovery rates similar to those with hospital based management. Since 2007, the WHO recommends RUTF for homebased management of uncomplicated SAM. However, acceptance of this recommendation has been limited in countries like India. An important reason for the reluctance is the lack of evidence from controlled trials of the efficacy of RUTF compared with other treatment options.

The Program

Randomised trial to compare the efficacy of centrally produced RUTF (RUTF-C) and locally prepared RUTF (RUTF-L) for home-based management of children with uncomplicated SAM on recovery rates compared with micronutrient-enriched (augmented) energy-dense home-prepared foods (A-HPF), the comparison group.

The study was conducted in three diverse geographical settings in India—Rajasthan, Tamil Nadu and Delhi. The study populations were low-income households quite diverse, with a mix of rural and urban areas. The three sites also varied in the programmatic context. Enrolment began in October 2012 and follow-up was completed in April 2015.

The Results

Recovery rates with RUTF-L, RUTF-C and A-HPF were 56.9%, 47.5% and 42.8%, respectively. The adjusted OR was 1.71 (95% CI 1.20 to 2.43; $p=0.003$) for RUTF-L and 1.28 (95% CI 0.90 to 1.82; $p=0.164$) for RUTF-C compared with A-HPF.

Weight gain in the RUTF-L group was higher than in the A-HPF group (adjusted difference 0.90 g/kg/day, 95% CI 0.30 to 1.50; $p=0.003$). Time to recovery was shorter in both RUTF groups. Morbidity was high and similar across groups. At the end of the study, the proportion of children with weight-for-height Z-score (WHZ) >-2 was similar (adjusted OR 1.12, 95% CI 0.74 to 1.95; $p=0.464$), higher for moderate malnutrition (WHZ <-2 and ≥-3 ; adjusted OR 1.46, 95% CI 1.02 to 2.08; $p=0.039$), and lower for those with SAM (adjusted OR 0.58, 95% CI 0.40 to 0.85; $p=0.005$) in the RUTF-L when compared with the A-HPF group.

The Learnings



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Home-based management of children with uncomplicated SAM is an effective and feasible option and that use of a RUTF-L results in higher recovery rates than feeding nutrient-dense and calorie dense home foods. The gains observed during the initial 16 weeks, however, decline after treatment. Other approaches need to be considered to improve long-term outcomes including prolonged use of a RUTF-L. Setting up local units for production of RUTF does not require huge investment in terms of equipment, infrastructure or personnel. The procedures for production are systematic and simple to replicate

Indigenously Prepared Ready-to-use Therapeutic Food (RUTF) in Children with Severe Acute Malnutrition

Alka Rajendra Jadhav, Prachi Karnik, Lavina Fernandes¹, Sneha Fernandes¹, Narendra Shah and Mamta Manglani¹

The Context

Malnutrition is a major health concern in Indian children, not only in rural areas, but also in urban slums. Every third malnourished child in the world lives in India. Globally, around 20 million children under 5 years of age have Severe acute malnutrition (SAM) and 40 percent of these (8 million) are in India. This accounts for 6.4% of all Indian children under five years of age.

Conventionally malnutrition was attributed to protein and/or energy deficiency. Newer research reveals that it is primarily due to deficiency of type II nutrients leading to loss of appetite, growth cessation, reductive adaptation to environmental stress, oxidative stress or infection. Most of these children also have deficiency of type I nutrients that affect specific physiologic functions.

The standard of care recommended by WHO in management of SAM is Ready-to-use Therapeutic Foods (RUTF) containing balanced amounts of all necessary nutrients (Type 1 and 2) in the bioavailable form. Evidence for feasibility, acceptability, safety and efficacy of RUTF is lacking in India.

The Study

The Department of Pediatrics, LTMG Hospital established an RUTF-I (MNT) production unit as part of its state-of-the-art Nutrition Rehabilitation, Research and Training Centre (NRRTC) at Urban Health Centre (UHC), Dharavi. The ingredients of RUTF-I (MNT) were peanut butter (25%), skimmed milk powder (24%), powdered sugar (28%), soya bean oil (21%), and micronutrients (1.6%) with emulsifier (0.4%), which meet the WHO recommendations on RUTF composition.

The Results

Rate of weight gain was higher ($P < 0.05$) at 2 weeks on indigenous Ready-to-use Therapeutic Food (Medical Nutrition Therapy) (5.63 g/kg/day) as compared to Standard Nutrition Therapy (3.43 g/kg/day). 61.2% subjects achieved target weight compared to 47.7% controls. At 8 weeks, 82.8% subjects recovered from Severe Acute Malnutrition compared to 19.3% controls ($P < 0.005$). The results obtained in community were comparable to facility-based indigenous Ready-to-use Therapeutic Food (Medical Nutrition Therapy). The morbidity was less in study group at follow-up.

The Learnings

- Indigenous Ready-to-use Therapeutic Food (Medical Nutrition Therapy) appeared to be superior to Standard Nutrition Therapy in promoting weight gain in children with Severe Acute Malnutrition.
- Indigenously prepared RUTF is feasible and effective in SAM management, not only in facility-based but also in community-based care, both in supervised and unsupervised settings.



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Acceptability and Efficacy of Locally Produced Ready-to-Use Therapeutic Food Nutreal in the Management of Severe Acute Malnutrition in Comparison With Defined Food: A Randomized Control Trial

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The Context

Severe acute malnutrition (SAM) is a salient health problem in India. Federation of Indian Chamber of Commerce and Industry (FICCI) Research and Analysis Centre, New Delhi, prepared nutreal equivalent to ready-to-use therapeutic food by World Health Organization (WHO) for the management of SAM and defined food like homemade diet.

The Program

The objective of the study was to study the acceptability and efficacy of Indianized locally produced RUTF, that is, nutreal, in comparison with defined food for the nutritional management of SAM in the community. Nutreal is a nutrient energy homogenous paste prepared by FICCI Research and Analysis Centre, New Delhi. Nutreal is prepared with roasted peanuts, milk powder, vegetable oil, sugar, and adequate minerals and vitamins mixture.

One hundred twelve children aged less than 5 years with SAM, defined by weight for height (WHZ) <- 3 standard deviation, with no evidence of infection or edema, participated. Study was carried out in slums of tricity Chandigarh, Panchkula, and Mohali, North India. This study was conducted from August 01, 2013, to March 30, 2014.

The Results

Ninety three percent of children accepted nutreal eagerly as compared to defined foods (68%). The nutreal in the paste form was liked by the children, and weight gain was more (23 g/d) in comparison with defined food (14 g/d) group. Moreover, the nutreal can be fed directly without mixing anything or cooking. The acceptance and efficacy of nutreal is consistent with the RUTF recommended by WHO.

The Learnings

- Ready-to-use therapeutic food has been used widely to treat SAM at home and has been shown to be very effective to improve the health of uncomplicated SAM children faster than homemade foods.
- Homemade foods have limitations in terms of composition, ingredients, methods of cooking, and feeding under unhygienic conditions.
- Moreover, social, cultural, and ethnic factors, poverty, and illiteracy also affect the dietary intake by young children.
- A need for largescale production of nutreal at cheaper rate in our country to take care of the colossal problem of uncomplicated SAM at home. We have 8 million children having SAM and around 1.6 million children die annually in our country. So it is of utmost important to prevent, detect, and treat SAM effectively.
- Need to study nutreal further in a large cohort of uncomplicated SAM children in community.
- Those children who are attending hospitals can also be treated with nutreal on outpatient basis at home under supervision and can regularly be followed in the hospital regarding the acceptability



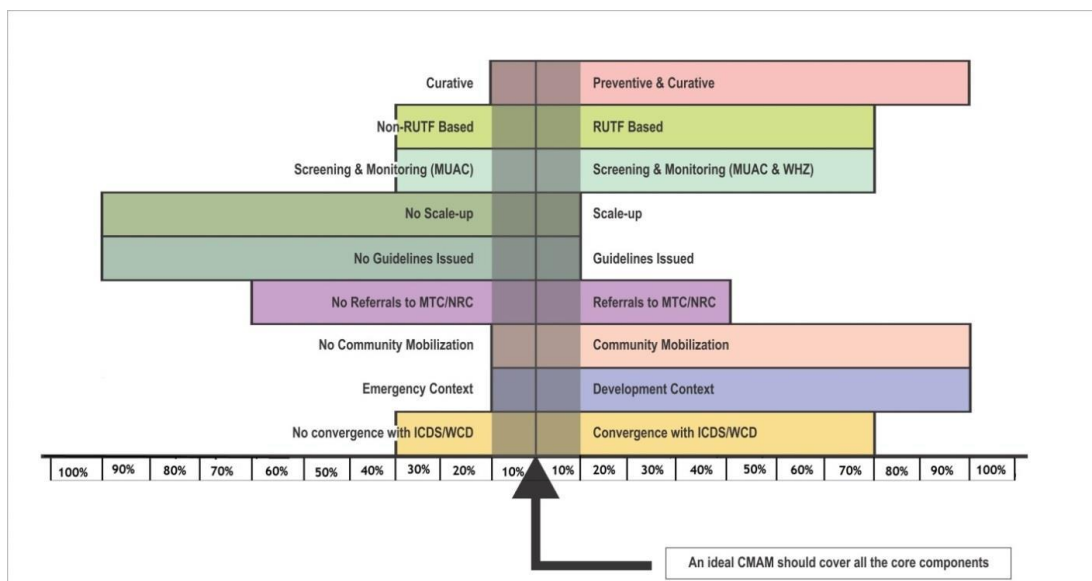
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and documentation of weight gain and onset of any infections or other complications like refeeding syndrome.

- The nutritional management of uncomplicated SAM in children can also prevent further complications and hence curtail morbidity and mortality due to SAM.

Community –based Management of Acute Malnutrition (CMAM) in India

An analysis of ten pilot projects², revealed the components of an ideal CMAM programme. Figure below. Further, Apart from all these components that the pilots covered in some way or the other, all organizations suggested that a more inclusive approach bearing cost effectiveness of implementing CMAM at the community level to eradicate malnutrition should be a prerequisite for a CMAM strategy.



² Community based Management of Acute Malnutrition (CMAM)-MSF; The EggDOT Initiative- Ojus Medical Institute⁷ and Savitri Waney Charitable Trust's initiative; *Phulwari scheme*- Jan Swasthya Sahyog (JSS) is the implementing agency receives support from the Sir Dorabji Tata Trust (SDTT). Chhattisgarh Government; *Aahar*- SNEHA along with the MWCD; *Urgent Management And Nutritional Growth (UMANG)*- World Vision India & Government of India; *"Eradicate Malnutrition"* program- Real Medicine Foundation (RMF); *Community-based pilot to treat cases of Severe Acute Malnutrition (SAM)*- Department of Women and Child Development (DWCD) and the Department of Health and Family Welfare (DoHFW) jointly launched the pilot project with VALID is the Technical partner; *CMAM*- SAVE The Children supported by the Government of Maharashtra; *CMAM*- Child in Need Institute; *POSHAN*-Government of Rajasthan.



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