Emergency Nutrition, Nigeria (2022-2023)

COST-EFFICIENCY ANALYSIS, OCTOBER 2024

Summary

Catholic Relief Services (CRS) analyzed the cost-efficiency of preventing and treating Moderate Acute Malnutrition in children under the age of 5 years through the community-based supplementary feeding program "Tom Brown" in Nigeria. The analysis showed the following findings:

- It costs between **$50 to $66 to treat a child for MAM in Northeast Nigeria.** The range of cost is explained by the food supplements used and the different delivery modalities.
- The **average unit cost of the food supplement** provided may affect the overall cost efficiency.
- Leveraging the **already existing expertise and operations lowers the direct shared cost;** therefore, increasing the direct program costs enables interventions to reach more beneficiaries and improves cost efficiency.
- In addition to improving treatment outcomes, child growth and development, **using locally available food commodities for management of MAM** promotes **acceptance in the community**.
- **We speculate that** layered and sequenced multisectoral interventions have a direct impact on treatment outcomes however more studies designed to test this modality's effect on nutrition treatment outcomes are necessary.

Thanks to Brigid O'Connor, George Oguna, Florence Obura, Alice Odeh, Wilson Kipkoech, Mivanyi Wazamari, Philemon Yatu, Augustine Joseph, Esther Emanuel, Solomon Dadean and Lola Alao for contributing to the analysis. Thanks to Paul Bartilol and Heather Dolphin for the Technical Assistance.

Catholic Relief Services | 228 W. Lexington Street, Baltimore, MD 21201, USA | crs.org | crsespanol.org

Introduction

Moderate acute malnutrition (MAM) is a condition characterized by a moderate deficiency in the intake of calories, protein, and other essential nutrients, often affecting children under the age of five, pregnant and lactating women, and individuals living in impoverished or food-insecure regions.

In children under the age of five, MAM manifests through various key features which may include: weight loss, stunted growth, muscle wasting, fatigue & weakness, delayed development, and increased susceptibility to infections among others.

Early detection and intervention are essential to prevent the progression of MAM to more severe forms and to mitigate its long-term consequences. Regular monitoring of growth and nutritional status, along with timely access to healthcare and nutrition services, are vital components of effective management strategies. Nutritional supplementation, therapeutic foods, micronutrient supplementation, and appropriate medical care are essential components of treatment for children with moderate acute malnutrition. Treatment and prevention strategies for MAM typically involve a combination of nutritional interventions, such as ready-to-use supplementary foods (RUSFs), nutrient supplements, and nutritional counselling. Addressing underlying causes such as poverty, food insecurity, disease, and poor sanitation is also crucial in preventing and managing MAM.

Catholic Relief Services is implementing a food supplement for children with MAM aged 6-59 months dubbed "Tom Brown". Tom Brown is a powder produced from a blend of nutritious locally available ingredients and typically prepared as porridge. CRS has a long history of including Tom Brown as part of its nutrition activities across Nigeria. This supplemental food has been provided as part of humanitarian response to support vulnerable children, and as part of broader food security and nutrition efforts.

The CRS Tom Brown supplementary feeding program aligns with the widely accepted community-based management of acute malnutrition (CMAM) approach to managing acute malnutrition in emergency and development situations. The supplementary feeding program's primary purpose is to help children with MAM recuperate and to prevent their deterioration to SAM through (1) screening and referral, (2) eight weeks of monitored supplemental feeding, (3) infant and young child feeding (IYCF) counselling and (4) weekly middle upper arm circumference (MUAC) monitoring to track progress.

Analysis Approach and Methodology

Cost efficiency analysis is a process used to evaluate the relationship between the costs incurred and the achieved outputs. It aims to assess how effectively resources are being utilized to produce desired outputs allowing organizations to compare cost-per-output for programs which all target the same goal.

In May 2024, CRS conducted cost-efficiency analyses to assess the cost per child treated for MAM for two different delivery mechanisms in the health and nutrition sector:

a) **Non-Market (In Kind) based approach -** Implemented by providing Tom Brown ingredients to beneficiaries through central purchasing and warehousing by CRS and later distributed to lead mothers by local implementing partners for Tom Brown production. The lead Mothers coordinate share out of the flour to respective caregivers in their groups

b) **Market based approach –** Implemented by CRS' price negotiation with vendors and provision of e-vouchers to lead mothers to redeem Tom Brown ingredients at the local shop on a weekly basis. The voucher value depends on the local commodity market prices with the maximum possible value of $11.75 (which feeds twelve children per week). The lead Mothers coordinate share out of the flour to respective caregivers in their groups

Data

The cost-efficiency analyses were conducted using the actual costs incurred and outputs achieved in projects implemented between June 2022 and September 2023 depending on approach implemented (Table 1).

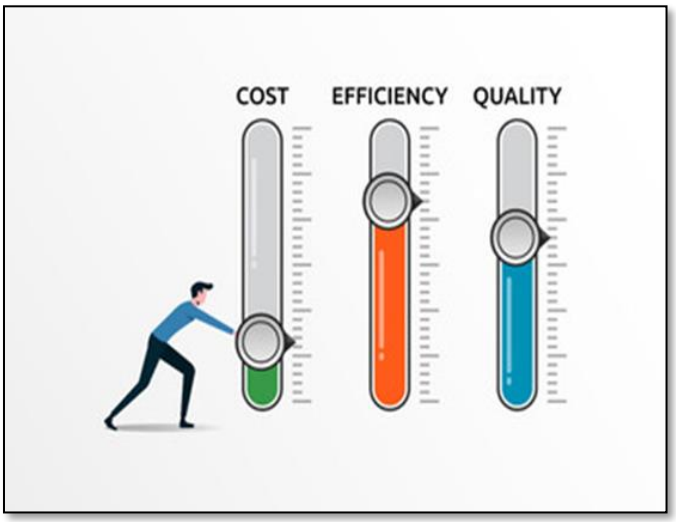
The cost-efficiency metric, **cost per child recovered from moderate acute malnutrition**, was calculated by dividing the total costs incurred on MAM case management components by the total number of children who recovered from MAM.

The process utilized the Dioptra tool over four virtual sessions of two to three hours each.

TABLE 1: DATA FRAME

Approach	Non-Market based	Market based
Data period (Output & Expenses)	June2022-Sept 2023	Sept 2022-Sept 2023
Total children screened	27,112	29,418
Total MAM cases enrolled	9,621	8,655
Defaulters	2 (0.02%)	78 (1.1%)
Deaths	10 (0.1%)	31 (0.4%)
Total No. of children recovered	9,558 (99.9%)	6,961 (98.5%)

Dioptra

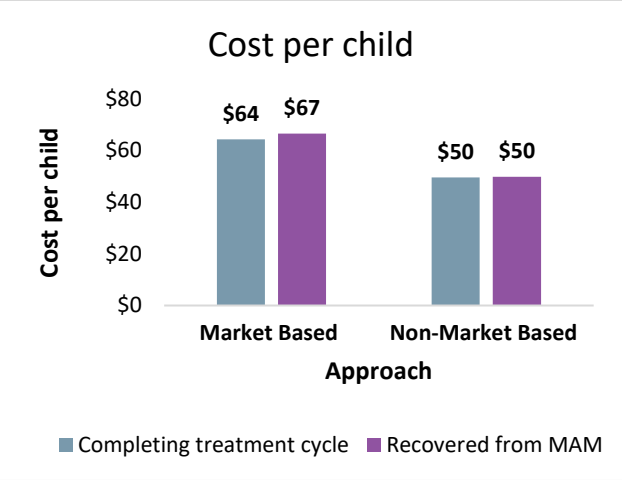


Dioptra is a web-based cost analysis software that allows program staff in country offices, who are most familiar with day-to-day program implementation, to rapidly estimate the cost-efficiency of their program activities. It guides users through a standardized costing methodology, ensuring that all analysis results are methodologically consistent and can be meaningfully compared across different contexts and organizations.

By using the Dioptra tool, rather than having to learn a complex costing methodology and assemble data manually in spreadsheets, staff can focus on providing crucial estimates of how different resources were used across activities within a program, which are not captured in any current data system. For more information, see www.dioptratool.org/how-does-dioptra-work .

Results

It cost between $50 to $67 to treat a child for MAM in Northeast Nigeria using a Community Management of Acute Malnutrition (CMAM) intervention that provides the Tom Brown supplementation: The cost difference is dependent on the food supplements delivery mechanism.



The difference in cost is largely due to differences in location context and as well as the modality utilized in acquiring and distributing raw materials for the Tom Brown flour ingredients. Both approaches utilized local procurement to secure the best value from the market. However, the unit cost of the market-based ingredients differed from month to month, majorly driven by inflation and other local market dynamics.

The project team carried out monthly price monitoring and renegotiated commodities with vendors. Other methodologies of treatment and prevention of MAM do exist. Differences are due to the type of food supplement (Locally available materials or ready to use) and/or the treatment methodology (OTP or CMAM).

Average unit cost of the food supplement purchased can affect the overall cost efficiency.

The Tom Brown ingredients are locally available nutritious materials which include millet, sorghum, soya beans, groundnut and cloves(optional). The average price per kg of these materials were not consistently different for four out of five required materials however one item contributed to the difference in efficiency cost.

The non-market approach (in kind) costs less on average ($3.7 per kg compared to $8.6 the market-based approach). While the average cost of the four cereals (millet, sorghum, soyabeans, groundnut) across approaches was the same ($0.9 per Kg), cloves cost almost 3 times the price paid for the non-market approach ($39.5/kg vs. $15.1/Kg). This difference is attributed to market price changes affected by demand and supply of the products.

Table 2-Average Price of Raw Materials Per Kg In $

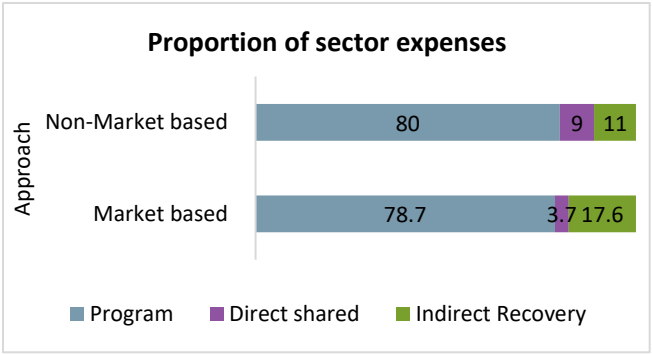
	Market based	Non-market based
Millet	0.7	0.5
Sorghum	0.7	0.5
Soyabeans	0.8	0.8
Groundnut	1.4	1.7
Cloves	39.5	15.1

*2023 average exchange rate of $: NGN 635.23

The cost of cloves was a significant driver on the overall cost per child recovered, contributing towards 92% and 81% of the total Tom Brown ingredient basket price for the market based and the non-market-based approach respectively. Cloves are used as preservative for the Tom Brown flour and since the beneficiaries utilize the flour within seven days, cloves have since been excluded in the subsequent Tom Brown baskets.

Leveraging already existing expertise and operations lowers the direct shared cost; increasing the direct program costs enables interventions to reach more beneficiaries as well as improving cost efficiency.

In both approaches, the highest expense was in the program sector. This included the costs of kitchen utensils for lead mothers, the cost for program staff, for the purchase of Tom Brown ingredients, for procuring, training, supervising, the cost for stipends to lead mothers) and associated travel and transport costs. Direct shared cost was relatively low (below 10%) as the projects relied on more support from other sectors within the larger program.



Most of the costs were spent on staffing (36.5% by the market approach and 43.3 % by the in-kind approach). This was necessary because the project's CMAM approach required more mentoring and supervision of caregivers in the Tom Brown supplement preparation and for the monitoring of children's progress. The next largest spending category was material and activities, which included mostly Tom Brown ingredients and kitchen equipment. (Figure 2)

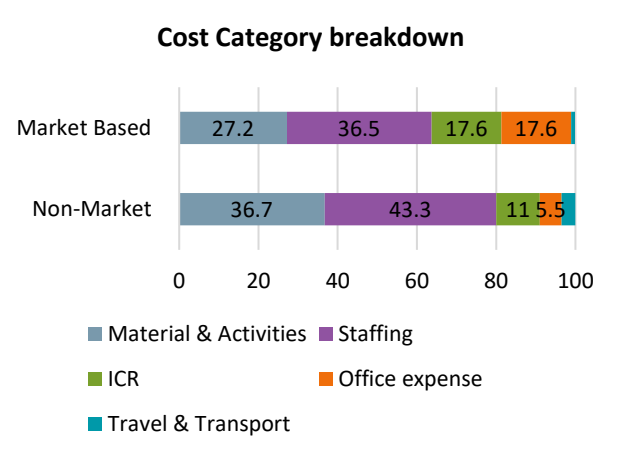


Figure 1: Category Breakdown Costs

In addition to improving treatment outcomes, child growth and development, using locally available ingredients for management of MAM promotes community acceptance.

Utilizing Tom Brown to manage MAM cases enhances acceptance from community members to trust the use of the food supplement. The mothers are also mentored on safe, clean, and nutritious cooking practices for their households.

As the community embraces locally available ingredients for food supplements, the demand of these materials can revitalize local agricultural productivity activities and be a source of income to the farmers.

The intervention cumulatively cured 16,519 children under 5 of Moderate Acute Malnutrition, representing 98% of those completing the treatment cycle. Given that at least 30 percent of the children screened were identified as suffering from Moderate Acute Malnutrition, this cure rate also contributes to a possible reduction of Global Acute Malnutrition (GAM) levels among children in the target communities by preventing MAM cases from deteriorating into SAM cases.

The cost to treat severe acute malnutrition (SAM) in Northern Nigeria varies depending on the state, the type of treatment, and the cost of the Ready to Use Therapeutic Food (RUTF). According to Global Nutrition Cluster Technical Alliance report, it cost an average of US$169-251 per case of SAM admitted to a stabilization center (SC) or OTP, and US$117-166 per case of MAM admitted to a targeted supplementary food program (TSFP). Compared to SAM treatment, MAM treatment using Tom Brown is a much more cost-effective way of improving child nutrition and well-being at a lower cost [1].

It is worth noting that the 98% cure rate of CRS Nigeria's Emergency Nutrition program surpassed the minimum acceptable SPHERE standard of 75%.[2] This result could be related to the layered, sequenced and integrated multi sector intervention within which these activities took place although further studies would be needed to establish such a correlation.

[1] It cost an average of US$169-251 per case of SAM admitted to a stabilisation centre (SC) or OTP, and US$117-166 per case of MAM admitted to a targeted supplementary food programme (TSFP). Chui, J. and Trenouth, L. 2024. IMAM Costing in Northeastern Nigeria. Global Nutrition Cluster Technical Alliance.

[2] Acceptable cure rate >75%-https://www.spherestandards.org/