

MAM and SAM cases reduced through a stunting prevention programme in Malawi and the associated costs averted

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A programme beneficiary in her green homestead garden

Vanessa Jones/WFP

Location: *Malawi*

What we know: Stunting and wasting are related manifestations of undernutrition; little is known about the effect that stunting prevention programmes have on the burden of wasting.

What this article adds: From January 2014 to March 2018, the Government of Malawi (GoM), with technical and logistical support from the World Food Programme (WFP) and financial support from the Children's Investment Fund Foundation (CIFF), implemented a comprehensive stunting prevention programme in Ntchisi district, Malawi. External evaluation at baseline and endline in both implementation districts saw a significant fall in severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) incidence compared to controls. Over the course of the programme, reduced caseloads of 2,582 MAM beneficiaries and 470 SAM beneficiaries were estimated, averting USD301,070 of costs otherwise associated with their treatment. Programme monitoring identified improvements in dietary diversity, minimum acceptable diet, infant and young child feeding and hygiene practices. Impact on stunting prevention will be available soon in a peer-review publication.

Introduction

Over the past 15 years, the global nutrition community has successfully established an investment case for interventions to prevent undernutrition. The World Bank estimates that cumulative effects of undernutrition create total gross domestic product (GDP) losses of approximately 11% in Asia and Africa (Global Nutrition Report, 2016). As a result, programmes to prevent undernutrition are often considered to be among the most cost-effective interventions in global health (Horton and Hoddinott, 2015). However, less attention has been paid to the more immediate benefits of reduced demand on health services that can result from prevention programming.

Interventions that aim to reduce child undernutrition often focus on a single form of undernutrition, such as child wasting or stunting (Khara & Dolan, 2014); yet there is evidence that most of the risk factors for a child becoming wasted or stunted are the same (Martorell & Young, 2012) and that these two manifestations of undernutrition are linked, whereby a wasted child is more likely to become stunted and vice versa (Richard *et al*, 2012). Practitioners are therefore calling for greater integration of nutrition interventions and better monitoring to evaluate crossover impacts (Khara & Dolan, 2014). Little is known about the effect that stunting prevention programmes can have on wasting prevalence.

Box 1 What is the difference between WFP programmes to prevent stunting and to prevent acute malnutrition?

WFP stunting prevention and acute malnutrition prevention programmes are multi-faceted in nature.

Both include SBCC (to deliver messages to encourage improved practices in key areas) and IYCF promotion activities and promote nutrition-sensitive activities that deal with underlying causes of malnutrition, such as improved WASH facilities, homestead gardens and small-livestock production.

A key difference is the duration of specialised nutritious food (SNF) provision. Blanket supplementary feeding programmes (BSFPs) are a core intervention of acute malnutrition programmes that are usually planned for short periods of between three and six months. In stunting prevention programmes, SNFs are provided for a significantly longer time (usually 12 to 18 months).

Both programmes use medium-quantity lipid-based nutrient supplement (MQ-LNS) or Super Cereal Plus for children aged 6-23 months and Super Cereal for children over five years of age and PLW. In stunting prevention programmes only, SQ-LNS is also used for children under two years of age.

In Malawi, the national prevalence of stunting is considerable at 37%. Prevalence of wasting is 3% (DHS, 2015-2016). The Government of Malawi (GoM), with technical and logistical support from the World Food Programme (WFP) and financial support from the Children's Investment Fund Foundation (CIFF), implemented a stunting prevention programme in Ntchisi district, Malawi from January 2014 to March 2018. While stunting reduction was the primary objective of the programme (due for peer-review publication), it was hypothesised that the programme impact pathway could also reduce wasting. Wasting (weight-for-height z-score (WHZ)) and underweight (weight-for-age z-score (WAZ)) were therefore also monitored by the external evaluation team, John Hopkins University (JHU). The additional findings regarding wasting are shared in this article.

Design of the stunting prevention programme

The programme aimed to address chronic undernutrition over four years through a multi-dimensional design, targeting all children under two years of age and their caregivers and communities during the window of opportunity in the first 1,000 days of life (from conception to two years of age). Key components of the programme included:

- i) Provision of a small quantity of lipid-based nutrient supplement (SQ-LNS) to all children aged 6-23 months living in the programme district.
- ii) Provision of fortified blended flour (as well as sugar and oil) to pregnant and lactating women (PLW) suffering from moderate acute malnutrition (MAM) during the first months post-partum.
- iii) A social and behaviour change communication (SBCC) campaign targeting front-line workers (in the areas of health; water, sanitation and hygiene (WASH) and agriculture) and community leaders, households and caregivers to improve maternal diets, infant and young child feeding (IYCF) practices, and hygiene.
- iv) Support to government programmes such as the provision of iron and folic acid (IFA) supplements to pregnant women, deworming and vitamin A supplementation.
- v) Support to government for scaling up WASH promotion services in the district.

The programme also sought linkages with nutrition value chains and local agricultural production through homestead gardening (seed starter pack distributions) and small livestock rearing aimed at improving dietary diversity and the consumption of animal-source foods (ASF).

The programme elements were chosen after extensive research and discussions among programme partners and stakeholders, including the GoM, nutrition experts from local non-government organisations (NGOs) and United Nations (UN) agencies, and WFP staff at head-

quarter, regional and country levels. The approach was also informed by the Malawi Nutrition Education and Communication Strategy (NECS), which was part of the national Scaling Up Nutrition (SUN) Movement in Malawi. Box 1 summarises the main differences between WFP-supported stunting prevention programmes and acute malnutrition prevention programmes.

WFP systematically identified existing nutritional problems and evaluated potential options for addressing these problems to determine the most effective programme design for this context. A panel of international nutrition experts provided input and guidance on the strengths and limitations of each specialised nutritious food (SNF) considered for inclusion. In consultation with the GoM, WFP chose an SQ-LNS, based on the conclusion that this product would fill the nutrient gap without interfering with breast-milk consumption. SQ-LNS was also considered to have a lower risk of being shared than other products, high likelihood of acceptance by the community, and a high benefit-to-cost ratio compared to other product options. As per normal WFP programme operations, Super Cereal together with oil and sugar was distributed to PLW with acute malnutrition.¹

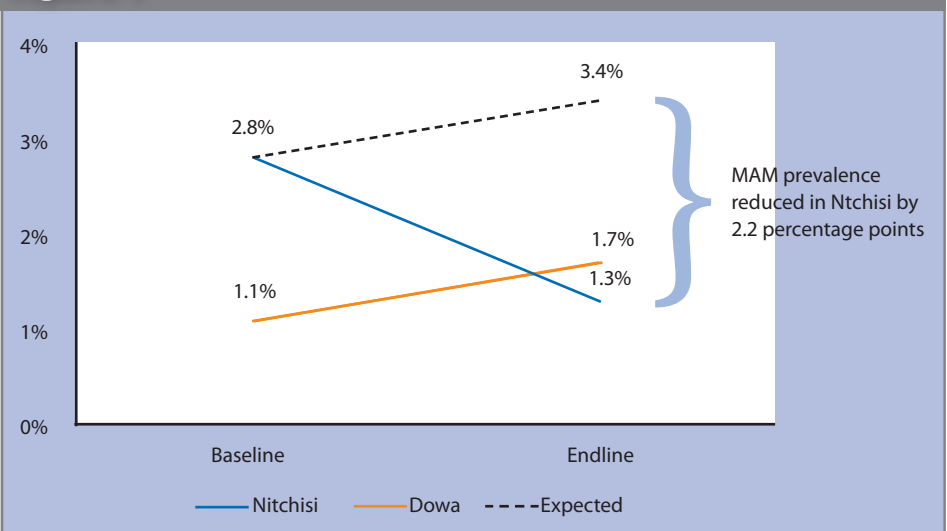
Given the importance of proper maternal nutrition, the programme was designed to complement ongoing government health initiatives for PLW by boosting demand for government IFA supplementation through community-based sensitisation to encourage mothers towards timely attendance at antenatal clinics (ANCs). Intended government coverage of IFA tablet distributions in the district was 100%. According to monitoring survey data, 81% of women received IFA tablets during their previous antenatal clinic (ANC) visit and, on average during the 4.5 years of programme duration, 54% consumed their IFA tablets within the last 24 hours. A separate report presents why adherence to the IFA tablets remained low, concluding that one of the main factors was the nausea effect women experienced on taking them (Museka-Saidi, 2018).

Formative research findings also highlighted the importance of including SBCC to optimise nutrition and health-related outcomes. Nutrition-sensitive components were introduced in the second year in response to the challenge in accessing diverse diets in Ntchisi district, including small-livestock promotion and homestead gardens. Other nutrition-sensitive actions included WASH activities, such as advocating with the government to drill community boreholes and encouraging households to build pit latrines, handwashing stations and dishwashing racks.

Evaluation methods

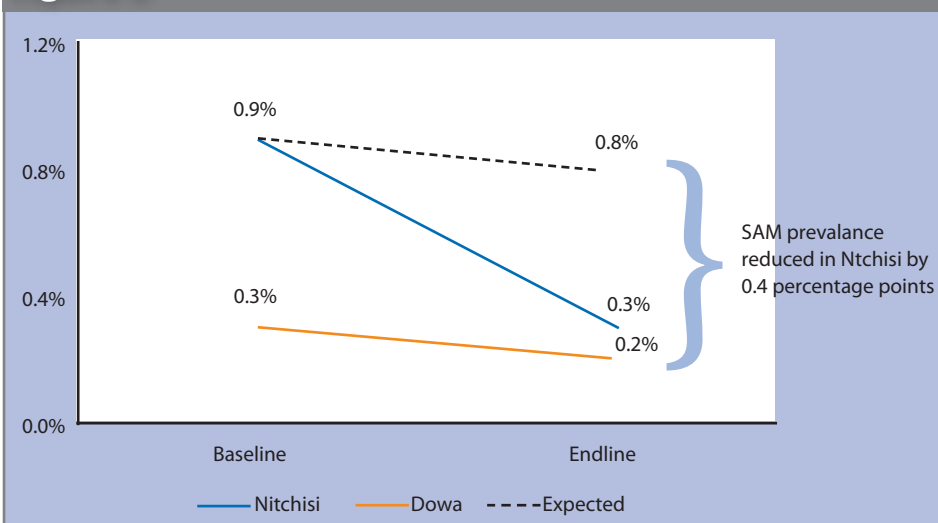
JHU conducted a comprehensive evaluation of the programme,² assessing various anthropometric indicators of undernutrition through cross-sectional surveys and assessing body composition and child-development indicators with

Figure 1 MAM prevalence at baseline and endline in Ntchisi and Dowa and difference-in-differences



¹ WFP Specialized Nutritious Foods (SNF) factsheet (April 2018): <https://docs.wfp.org/api/documents/WFP-0000100654/download/>

Figure 2 SAM prevalence at baseline and endline in Ntchisi and Dowa and difference-in-differences



and endline, but this reduction was greater in Ntchisi (Figure 2). The resulting DID analysis indicates that the stunting prevention programme in Ntchisi resulted in a reduced MAM prevalence of 2.2 percentage points and a reduced SAM prevalence of 0.4 percentage points. These results are statistically significant ($p < 0.05$).

Estimating reduced incidence of acute malnutrition

Using MAM and SAM prevalence data, it was possible to estimate the number of children who did not suffer from acute malnutrition in Ntchisi who would otherwise have done so in the absence of the stunting prevention programme. The methodology used was developed by the CMAM Forum⁴ to estimate the incidence of acute malnutrition based on prevalence. This methodology is consistent with other guidance on estimating incidence of acute malnutrition (e.g., see Kakietek *et al.*, 2018). Incidence = (N)(P)(K), where:

- N = Population
- P = Prevalence of acute malnutrition
- K = A multiplier to estimate the rate of new cases within a given time period

The following numbers are estimated for Ntchisi district:

- N = 15,182 (population of children aged 6-23 months, as estimated by WFP monitoring data for March 2015)
- P = 2.2% for MAM and 0.4% for SAM (based on DID results above)
- K = 2.6 (a standard multiplier within a 12-month period based on CMAM Forum methodology for estimating incidence)

Calculating (N)(P)(K), it was found that, in 2015:

- 868 children did not suffer from MAM as a result of the stunting prevention programme;
- 158 children did not suffer from SAM as a result of the stunting prevention programme.

Assuming the consistency of figures across the entire length of the stunting prevention programme (January 2014 to March 2018), it can be estimated that 3,689 fewer children suffered from MAM and 672 fewer children suffered from SAM.

Caseloads and costs averted

The results above relate to the reduced incidence of acute malnutrition. In order to calculate the reduced caseloads (the number of MAM and SAM cases handled by MoH, WFP and partners through treatment programming), the incidence was multiplied by an assumed coverage level of 70%, estimated based on historical monitoring data for treatment programming. Over the full course of the programme (January 2014 to March 2018), this yields a reduced caseload of 2,582 MAM beneficiaries and 470 SAM beneficiaries.

longitudinal follow-up in a sub-sample. A cost-effectiveness analysis of the programme was also conducted.³ As it was hypothesised that the programme could reduce wasting (defined by weight-for-height z-score (WHZ)) and underweight (defined by weight-for-age z-score (WAZ)) as well as stunting, measures of acute malnutrition were also monitored.

Data were collected from Ntchisi, the intervention district, and Dowa, a comparison district, over the same period. Using cross-sectional data from both locations, JHU employed a difference-in-differences (DID) methodology for estimating the effect of the stunting prevention programme on MAM and SAM prevalence and propensity-score matching to help correct for differences between populations in the two districts.

Results

Incidence of SAM and MAM

Figures 1 and 2 illustrate the results from the DID analysis. The baseline survey (January 2014 to March 2014) included 2,404 participants (1,166 children and 1,238 PLW). The endline survey (January 2017 to April 2017) included 2,453 participants (1,333 children and 1,120 PLW). The same villages were sampled in both districts in both surveys (n=108 in Dowa; n=108 in Ntchisi).

In the absence of the stunting prevention programme, Ntchisi district would be expected to see a similar rise in MAM prevalence as that seen in Dowa; however, MAM prevalence was lower at endline in Ntchisi (Figure 1). Both districts saw a reduction in SAM between baseline



A community cooking demonstration showing diverse and healthy locally available foods

² A full report is due to be published by JHU research team in 2019. A summary report is available on request.
³ A full report is due to be published by JHU research team in 2019.
⁴ <https://www.ennonline.net/resources/estimatecaseloads>

It can be assumed that reduced caseloads decrease the financial cost of SAM and MAM treatment programmes. In Malawi's Operational Plan for Community Management of Acute Malnutrition (GoM, 2016), the government cites standard per-child costs for the treatment of both MAM (USD80.00 per child) and SAM (USD200.00 per child). Multiplying these costs by the reduced caseloads, it is possible to estimate that, as a result of the stunting prevention programme, in 2015 alone, USD 48,640 was not spent on MAM treatment programmes and USD22,200 was not spent on SAM treatment programmes (total USD70,840). Across the entire implementation period (January 2014 to March 2018), it can be estimated that a total of USD301,070 was not spent on MAM and SAM treatment programmes that otherwise would have been.

Additional findings based on programme monitoring

WFP's corporate beneficiary tracking and registration system (SCOPE) was used as part of a detailed monitoring and evaluation system to track implementation in near real-time to enable programme adaptation as needed. This programme was the first time SCOPE had been used for an in-kind intervention; previously the system had only been used for cash interventions.

Moving forward, SCOPE was adopted as the corporate solution for beneficiary registration and tracking for all WFP programmes.

WFP-led trimesterly programme monitoring revealed an average monthly attendance rate for caregivers at SNF distributions across the programme period of 82%. This figure exceeded WFP's Strategic Results Framework target of 70%. Tracking identified high scores for minimum acceptable diet (MAD) (which rose by 11%) and minimum dietary diversity (MDD) (which rose by 14%) across the programme period (both statistically significant ($p < 0.05$)). Data showed that intra-household sharing of SQ-LNS was low, with almost 90% of the monthly redeemed SNF being consumed by target children. While SQ-LNS contributed to improved child nutrition, when SQ-LNS was removed from the calculation, MAD and MDD both improved over time, based on the increased diversity of foods available in the household ($p < 0.05$). This finding suggests the additional positive effect of the SBCC and nutrition-sensitive components of the programme (homestead gardening and rearing of small livestock).

Indicators related to WASH also improved over the course of the programme. Data from regular programme-monitoring surveys show

that the percentage of households with children enrolled in the programme that owned hand-washing stations increased significantly ($p < 0.05$) and the percentage of children who had diarrhoea in the district decreased. These data are all based on regular programme-monitoring surveys.

These results show it is possible to achieve improvements in IYCF and WASH practices and maintain high attendance rates at SNF distributions by including appropriate, context-specific programme components.

Conclusion

While the reduction of stunting was the primary aim of the programme in Malawi's Ntchisi district, this article highlights secondary outcomes, such as the potential of a stunting prevention programme to reduce the number of children suffering from acute malnutrition. This can allow for financial resources to be reallocated as a result of reduced demand for MAM and SAM treatment programming. Furthermore, the additional impact of stunting prevention programmes on acute malnutrition can lead to positive outcomes related to maternal and child health and nutrition, and assist in overcoming the inter-generational cycle of malnutrition.

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An enumerator conducting a monitoring survey with a programme beneficiary

Alessandro Diurcci/WFP