

Adaptations to the Management of Acute Malnutrition in the Context of COVID-19

FINAL REPORT

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ACRONYMS

CHV	Community health volunteer
CHW	Community health worker
CMAM	Community-based management of acute malnutrition
CNV	Community nutrition volunteer
COVID-19	SARS-COV-2 (coronavirus disease)
ICCM	Integrated community case management
IMAM	Integrated management of acute malnutrition
IPC	Infection prevention and control
MAM	Moderate acute malnutrition
MoH	Ministry of Health
MUAC	Mid-upper arm circumference
NDMA	National Drought Management Authority (Kenya)
NGO	Non-governmental organization
OTP	Outpatient therapeutic feeding program
PPE	Personal protective equipment
RCCE	Risk communication and community engagement
RUTF	Ready-to-use therapeutic food
RUSF	Ready-to-use supplementary food
SAM	Severe acute malnutrition
SoAM	State of Acute Malnutrition
TSFP	Targeted supplementary feeding program
UNICEF	United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organization
WHZ	Weight-for-height Z-score

EXECUTIVE SUMMARY

Introduction

Acute malnutrition in children under five remains a critical challenge, exacerbated by the COVID-19 pandemic. Estimates indicate that up to 9.3 million more children will suffer from acute malnutrition by 2022. However, standard community-based management of acute malnutrition (CMAM) program models require proximity between health workers and patients, which may increase COVID-19 transmission risk. Furthermore, children must undergo frequent check-ups, a challenge under movement restrictions.

Following guidance from nutrition coordinating bodies, organizations and governments adapted their standard CMAM protocols to continue nutrition service delivery while reducing COVID-19 transmission risks. These adaptations include changes to community-based screening methods; modified admission and discharge criteria; reduced frequency with which children return to health facilities for follow-up visits; modified dosage of therapeutic foods; and shifts in where and how treatment is provided. Many of these, often referred to as 'simplified approaches' to the current CMAM model, have been piloted or trialed previously. Still, questions remain regarding feasibility, effectiveness, and cost and operational implications.

The mass rollout of these adaptations as the pandemic escalated in early 2020 presented a unique opportunity to examine them at an unprecedented scale. Therefore, Action Against Hunger USA, in collaboration with the United States Agency for International Development (USAID), the United Nations Children's Fund (UNICEF), and the US Centers for Disease Control (CDC), carried out a mixed methods study between July 2020 and May 2021. This study sought to achieve two primary objectives:

- (1) to document operational adaptations to CMAM programs prior to and during COVID-19; and
- (2) to identify and document lessons learned and operational implications from adaptations.

The findings presented in this report aim to both contribute to decision-making as the pandemic continues and to the simplified approaches evidence base by highlighting operational experiences and lessons learned. The report discusses takeaways consistent across adaptations and delineates lessons learned for five common adaptations: Family MUAC; modified admission and discharge criteria; reduced frequency of follow-up visits; modified dosage of therapeutic foods; and providing treatment when facilities were inaccessible.

Methodology

The study comprised two stages. First, a screening survey was circulated among nutrition coordination mechanisms and non-governmental organizations (NGOs) to document which implementing organizations were applying COVID-related CMAM adaptations and where. Surveys were collected between July 2020 and January 2021, with a follow-up survey circulated to identify updates in May 2021. Results were published in a live map on the State of Acute Malnutrition website. Second, the research team conducted semi-structured interviews with practitioners. These interviews probed the following themes related to program adaptations during the pandemic: decision-making actors, processes, and factors; operational considerations; and strengths, challenges, and lessons learned, including perceived impacts on program performance. Interviews were recorded and transcribed, and analyzed using thematic analysis.

Key Findings

Overall, respondents submitted surveys representing 75 countries in North America, South America, Asia, and Africa. These responses included those of 19 organizations running programs in 28 countries, and UNICEF's guidelines in 70 countries. Respondents reported implementing CMAM adaptations during the pandemic in 69 countries. Overall, the most common adaptations were Family MUAC and reduced frequency of follow-up visits. Seven partners working in 13 countries responded to the follow-up survey;

most reported no changes. Within the second stage, the research team conducted 43 interviews with 46 individuals representing 19 organizations working in 20 countries. The sections below summarize the key findings and lessons learned from interviewees across adaptations and for each adaptation individually.

Cross-Cutting Themes: Decision-Making, Rollout, and Logistics

Overall, interviewees reported that decision-making about adaptations was a multi-step process, most often led by Ministries of Health in collaboration with the Nutrition Cluster, UNICEF, WFP, other coordination and working groups, and implementing partners. Governments and organizations largely used cascaded approaches to inform stakeholders about protocol adaptations. Gathering restrictions and lockdowns drove innovation and flexibility in how orientation and training were provided, with virtual trainings and meetings increasing. Many organizations pre-positioned supplies to mitigate anticipated supply chain ruptures; however, several COVID-related factors exacerbated shortages and stockouts.

Family MUAC

Under the Family MUAC approach, caregivers are trained to take their children's mid-upper arm circumference (MUAC) to identify and refer acute malnutrition earlier. Though many trials and pilots took place pre-pandemic, Family MUAC was scaled up during the pandemic to supplement or replace restricted or suspended community-based screening. Caregiver training typically followed a cascade approach, using virtual and socially distanced trainings wherever possible. However, training was often hindered by a lack of official guidelines and training materials and MUAC tape shortages. The approach enabled continued screening, though caregiver measurement accuracy varied widely. Some caregivers were initially reluctant to take the measurements, while some tensions arose over reallocating community worker responsibilities when shifting screening to caregivers. Despite these challenges, the approach was well accepted among staff and caregivers. Most interviewees indicated they would continue Family MUAC post-pandemic.

Modified Admission and Discharge Criteria

To minimize contact between staff and patients, many interviewees reported suspending weight and height measurements during the pandemic, requiring the suspension of weight-for-height Z-score (WHZ) as an admission criterion. While sometimes contentious, this adaptation reduced contact between staff and patients and streamlined caregivers' and patients' time at facilities, with both staff and caregivers relieved by reduced contact. Furthermore, using MUAC and edema only simplified staff training, and increased caregiver understanding of program protocols. However, some respondents were concerned that not using WHZ would exclude children needing care, mirroring global conversations about optimal admission criteria.

A few interviewees also noted implementing an expanded MUAC threshold for admission alongside the suspension of WHZ to continue treating children who may have otherwise been excluded. Decision-making bodies typically analyzed existing program data to identify optimal thresholds to balance treatment of at-risk children with the realities of resources and supply limitations associated with a sudden change in protocols, given that caseloads most often increased when thresholds expanded. Most interviewees indicated that they anticipated returning to standard criteria once transmission risks were lessened.

Reduced Frequency of Follow-up Visits

Reducing the frequency of follow-up visits was one of the most reported adaptations. Interviewees said this enabled crowd control and social distancing at facilities and alleviated caregivers' burden to travel under movement restrictions. While caregivers appreciated less frequent travel, in some contexts they struggled to store and dose the increased rations distributed at each visit. Interviewees also reported increased sharing and sale of the larger rations due to increased household economic insecurity. Some staff were also concerned that children's health could deteriorate rapidly without prompt intervention from frequent visits. Once again, interviewees noted that they would likely increase visit frequency when the pandemic lessened.

Modified Dosage of Therapeutic Foods

In response to suspended weight measurements, interviewees modified the dosage calculation for therapeutic food given to enrolled children, including either a universal dosage for all children with severe acute malnutrition or case-specific dosage. This adaptation enabled service continuity despite suspended weight measurements. It also streamlined service provision, since staff could quickly and easily prepare rations ahead of time, and simplified staff training and stock management and forecasting. Some caregivers were dissatisfied with the modified dosage, though this may stem from household food insecurity rather than the adaptation itself. Finally, interviewees expressed concern about negative impacts on children's progress, leaving them likely to revert to standard dosage protocols post-pandemic.

Treatment When Health Facilities are Inaccessible

Given access challenges during the pandemic, some organizations changed how and where follow-up visits took place, including treatment at household level and conducting phone visits during total lockdowns, enabling continued service provision. The division of responsibilities between staff and community workers varied. Transportation and last mile service delivery were common logistical challenges for home visits, while low-cost unlimited data plans enabled phone visits. Across all adaptations, consultation time increased significantly. However, interviewees reported difficulties identifying deterioration through phone visits. These adaptations were highly responsive to local conditions, and largely reverted once lockdowns abated.

Recommendations

As the pandemic continues, so will nutrition programs continue to innovate and adapt. This study illuminated several lessons learned from the complex adjustments undertaken to continue life-saving services and minimize transmission risk during the pandemic. Common best practices included ensuring adaptation buy-in among multiple stakeholders at all levels, and rolling out adaptations through multiple sources, such as facilities, community groups, home visits, and phone calls. Common challenges included reduced health seeking behaviors; continuing service provision and trainings despite movement and gathering restrictions; and limited standardized monitoring systems and adaptation-specific indicators. Moving forward, program design should increase sensitization on early identification and treatment of acute malnutrition as well as assuage caregiver concerns about viral transmission; and capitalize on opportunities for virtual trainings to reduce associated costs and increase access. The global nutrition community must also collectively develop tools and indicators specific to each adaptation to capture impacts and compare effects across contexts.

Recommendations: Family MUAC

- Train caregivers how to check for edema and other acute malnutrition danger signs in addition to measuring MUAC and integrate sensitization on causes and prevention of malnutrition.
- Plan for and procure sufficient MUAC tapes for wide distribution to maximize coverage.
- Clearly delineate roles of community volunteers, clinic staff, and caregivers in screening and referrals to streamline processes, maximize collaboration, and assuage tensions.
- Prepare clinics for elevated caseloads that may result from an initial increase in self-referrals.
- Retrain caregivers that self-refer children with inaccurate measurements and encourage them to continue health-seeking behaviors.
- Expand availability and coverage of MAM treatment services where Family MUAC is implemented.
- Develop standard monitoring and evaluation tools and indicators for use across contexts.
- When possible, Family MUAC should complement, not replace, traditional community-based screenings and surveillance.

Recommendations: Modified Admission and Discharge Criteria

- In the context of suspended WHZ, use available data to determine which revised MUAC thresholds would optimize identification of at-risk children for admission alongside available program resources and capacity.
- Increase staff and community sensitization when expanding admission thresholds to ensure proper care of children who meet the new requirements both at the clinic and home.
- Strengthen supply chains to meet increased needs for nutrition products (e.g., RUTF, RUSF, etc.) to cover potential caseload growth due to expanded thresholds.
- Develop guidance for implementing both expanded thresholds and Family MUAC to align cut-offs and referral processes.

Recommendations: Reduced Frequency of Follow-up Visits

- Provide strong community sensitization to reduce caregiver confusion caregivers and increase schedule adherence.
- Train caregivers how to monitor MUAC, edema, and acute malnutrition danger signs (e.g., through Family MUAC) to enable monitoring and early identification of deterioration between visits.
- Increase counselling at facilities and home visits to ensure robust caregiver support in dosing larger rations between appointments.
- Recommend more frequent appointments for sicker or more vulnerable children during treatment.
- Strengthen supply chains to support supply prepositioning to meet increased need for nutrition products for the extended period between visits.
- Explore storage alternatives for families unable to manage the larger ration sizes that accompany less frequent clinic visits.
- Develop context-specific interventions to address sharing and selling of nutrition products, including an assessment of the reasons for sharing and selling (e.g., economic or food needs, lack of awareness, etc.).

Recommendations: Modified Dosage of Therapeutic Foods

- Ensure that caregivers are consulted throughout implementation of the approach, with clear explanations given to justify the change in protocol.
- Closely monitor children's progress at and between facility visits, particularly for larger or more vulnerable children, to ensure adequate weight or MUAC gain and identify deterioration early.
- Engage with caregivers to support appropriate dosing and minimize sale and sharing of nutrition products, especially when combining modified dosage with extended time between follow-up visits.

Recommendations: Treatment when Facilities are Inaccessible

- Where possible, integrate a video or photo component to telehealth visits to enable visual anthropometric assessments.
- Ensure staff and volunteer safety while transporting supplies to children's homes. Coordinate with district health office and other local authorities to strengthen last mile stock management.

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INTRODUCTION

The COVID-19 pandemic has presented unprecedented challenges, especially in countries with existing humanitarian crises that heighten vulnerability to its direct and indirect impacts. In many contexts, essential, life-saving services have either been suspended or reduced amid broader efforts to stem transmission, exacerbated by already fragile health systems and chronic under-resourcing. As experienced in past epidemics, the impacts of such disruptions are especially deadly for young children. Projections estimate that, as a result of the COVID-19 pandemic, between 6.7 and 9.3 million more children will suffer from acute malnutrition by 2022 (1,2).

Acute malnutrition carries a high risk of mortality and morbidity (3). Community-based management of acute malnutrition (CMAM) programs are considered the standard of care for providing life-saving treatment to children under five years of age who are suffering from acute malnutrition (sometimes referred to as 'wasting') in low- and middle-income countries, areas with limited resources, and/or extreme conflict or crises. A CMAM program typically contains four elements:

- (1) Community outreach and mobilization to screen and detect children suffering from acute malnutrition and refer them for the appropriate treatment;
- (2) An outpatient-based targeted supplementary feeding program (TSFP) whereby children with moderate acute malnutrition (MAM) are treated by receiving take-home rations of specially formulated supplementary food (e.g., ready-to-use supplementary food, or RUSF; fortified blended flours, or FBF) on a weekly, bi-weekly, or monthly basis until discharge;
- (3) An outpatient-based treatment program (OTP) for cases of severe acute malnutrition (SAM) whereby children with SAM are treated by receiving medication and take-home rations of specially formulated therapeutic food (e.g., ready-to-use therapeutic food, or RUTF) on a weekly or bi-weekly basis until the child is discharged; and
- (4) Referral to inpatient facility, such as a stabilization center (SC) or hospital, whereby children with SAM and other medical complications are provided inpatient treatment.

The standard CMAM approach requires close physical proximity between health workers, caregivers, and patients. These activities are typically conducted at hospitals, health clinics, and other facilities whereby groups of people gather in settings with limited social distancing. Such standard programs present risk for transmission of the COVID-19 virus during the current pandemic.

Following guidance issued by the United Nations Children's Fund (UNICEF), Global Nutrition Cluster, and Global Technical Assistance Mechanism for Nutrition (GTAM) (4,5), many implementers have adapted their approaches for the management of acute malnutrition with the aim of continuing life-saving nutrition programs while limiting the spread of COVID-19. These adaptations include: Family MUAC; mid-upper arm circumference (MUAC)-only programming; reduced dosage of treatment foods; and various combinations of such approaches. Many of these adaptations, sometimes referred to as 'simplified approaches' to the current CMAM model, have been piloted or trialed previously with the intent of improving acute malnutrition diagnosis and treatment (6). Still, outstanding questions remain regarding feasibility, effectiveness, cost-effectiveness, and operational implications of these approaches.

Conversations among humanitarian stakeholders within formal and informal COVID-19 emergency response coordination mechanisms identified a need to capitalize on this unprecedented opportunity for a coordinated consolidation of evidence and analysis, focusing on operational implications of CMAM program adaptations during the pandemic and the consequent emergency response.

To meet this need, Action Against Hunger USA, in collaboration with the United States Agency for International Development (USAID), the United Nations Children's Fund (UNICEF), and the US Centers for Disease Control (CDC), carried out a mixed methods study between July 2020 and May 2021. This study sought to achieve two objectives: (1) to identify and document operational adaptations to CMAM programming in low- and middle-income countries prior to and during COVID-19; and (2) to identify and document lessons learned about CMAM adaptations as they relate to operational implementation (e.g., feasibility, caseload, workload, logistics, anticipated duration, community acceptability).

This report presents findings from this study, building on prior publications sharing preliminary results (7). Such findings aim to contribute both to decision-making as the pandemic continues and to the simplified approaches evidence base by highlighting practitioners' operational experiences and lessons learned. The report offers an overview of the study methodology; discusses themes and takeaways consistent across adaptations; and then delineates lessons learned for five common adaptations: Family MUAC; a reduced frequency of follow-up visits; modified admission and discharge criteria; modified dosage of therapeutic/supplementary foods; and providing treatment when facilities were inaccessible.

METHODOLOGY

This project sought to address the following questions regarding adaptations made to outpatient acute malnutrition treatment programming during the COVID-19 pandemic:

- Which adaptations were implemented, where, when, and by whom?
- How were the decisions made to implement adaptations? Who was involved in the conversations, and what factors were considered?
- What are the operational implications of implementing each adaptation (staffing, training, workload, program indicators, logistics, community acceptability)? What have the successes and challenges been in implementing these adaptations?
- How have organizations monitored the implementation of these adaptations?
- Which adaptations do organizations anticipate will become permanent features of acute malnutrition programming? What are the implications?

To address these questions, a mixed methods study was undertaken, with data collection carried out in two stages: a preliminary screening survey followed by semi-structured interviews.

Stage 1: Screening Survey

First, a survey was circulated to document which implementing organizations were applying COVID-related adaptations to CMAM treatment protocols and in which locations. These surveys included closed- and open-ended questions about adaptations made (modified dosages, modified follow-up visit schedules, changes to admission criteria, etc.); the location and context where each adaptation occurred; and anticipated duration of the adaptation's implementation. The full survey can be seen in Annex A. A complete list of adaptations and their definitions (as used by this study), can be found in Annex B. The survey was disseminated across multiple global practitioner professional networks, coordination mechanisms, and non-governmental organizations (NGOs) (see full list in Table 1). Respondents submitted surveys between July 2020 and January 2021, and a follow-up survey to update adaptation status was circulated in May 2021.

Table 1: List of nutrition actors contacted

Non-governmental organizations	Nutrition Coordination Mechanisms / Other
Action Against Hunger	CORE Group – Nutrition Working Group
ALIMA	CORE Group – Humanitarian-Development Task Force
American Refugee Committee	Global Nutrition Cluster (GNC)
Catholic Relief Services	Global Technical Assistance Mechanism for Nutrition (GTAM)
Concern Worldwide	InterAction
GOAL	NGO Forum
Hellen Keller International	No Wasted Lives
International Medical Corps	Nutrition Clusters – Country Level
International Rescue Committee	State of Acute Malnutrition (SoAM)
INTERSOS	Tech Rapid Response Team (RRT)
Medair	(Simplified Approaches Working Group (formerly ToPTI))
MSF	UNICEF
Mercy Corps	World Food Programme (WFP)
Oxfam	
People in Need	
Premiere Urgence Internationale	
Save the Children	
Tearfund	
Welt Hunger Hilfe	
World Vision	
Valid International	

Results from the initial screening survey were cleaned and uploaded to a “live” map on a website for nutrition practitioners: [State of Acute Malnutrition](#). They were also used to generate short summaries of the adaptations being implemented (i.e., location, programmatic details, duration, etc.) and case studies.

Stage 2: Semi-Structured Interviews

For the second stage of data collection, participants were identified to participate in interviews through a combination of purposive sampling (i.e., selected based on their knowledge, location, and reputation in the field of emergency nutrition) and snowball sampling. All participants who indicated a willingness to be interviewed through the initial survey were contacted via email and followed up with twice before attempts to contact them were stopped. After completing the interview, interviewees were asked for referrals to other key individuals at different levels of implementation in their area of operations, both within their own organizations and at other organizations or agencies. The research team purposively selected additional interviewees to maximize geographic and practitioner variation.

At each interview, two members of the research team were present, with one member leading the interview and the other taking detailed notes which would later be compared against the interview transcript. Using a pre-defined, semi-structured interview guide, the interviewer first confirmed the adaptations indicated in the interviewee’s survey response. They then asked for details and additional insights into each of the adaptations around the following themes: decision-making processes, staff training and buy-in, logistics and operational implications, perceived impacts on program performance and outcomes, and caregiver response to the adaptation, among other subjects. Interviewers were encouraged to ask follow-up and probing questions when interesting or unanticipated responses were offered by interviewees. The full interview guide can be found in Annex C.

Interview data were captured through a transcribed audio recording and detailed notes. Notes were cleaned and uploaded to a shared project drive the day of the interview, with transcripts completed by a participating team member. The research team held debrief discussions on the same day as most interviews to discuss questions and clarifications. These debriefs identified major themes, patterns, and remaining inconsistencies or further points to follow up on from that specific interview. Key takeaways were included in the notes for each interview. Initial findings were integrated into a matrix of thematic areas for each adaptation, derived from the research questions, to (1) inform initial case studies posted on the SoAM website and (2) assess data saturation.

The research team collaboratively developed a codebook to apply to the transcripts, using both deductive codes derived from the research questions, data collection tools, and initial findings matrix, and inductive codes added throughout analysis. The first four transcripts were coded independently by two reviewers to verify coder agreement and consistent code application. Subsequently, one transcript out of every batch of five was randomly selected for review by a second coder to verify continued alignment. After a first review of all transcripts, a reviewer went through each transcript a second time to apply inductive codes identified throughout the coding process.

After coding each transcript, the coder added notes to iterative adaptation- and country-specific memos. These memos served to identify key takeaways, triangulate findings, tie takeaways to themes from other transcripts, and identify irregularities, contradictions, and points for further investigation or clarification. Memos also housed key quotes and potential conclusions and outlined additional evidence necessary to draw conclusions.

To identify patterns and trends within the data, the research team generated quote reports for each parent code in the codebook, organized by the corresponding adaptation. The research team used these reports to identify common and unique findings and notable takeaways. Key findings are defined either as (1) points identified consistently across multiple geographies or adaptations; or (2) context-specific factors or findings that had a significant impact on implementing the adaptation.

To ensure the rigor and quality of the analysis and reporting of this research, the COREQ checklist for reporting qualitative research was used to ensure that relevant methodological details were shared, research team reflexivity was acknowledged and accounted for, and that the results and findings were clearly and consistently presented. The COREQ checklist is a 32-point reporting checklist designed to ensure that reporting of essential elements of qualitative research design are reported (8).

Ethics Statement

The study protocol was approved by Solutions IRB (Reference #2020/06/18). All interviewees gave written informed consent before agreeing to take the initial screening surveys. Individuals contacted for interviews then gave additional verbal consent to participate in the interviews and for the conversation to be recorded prior to beginning their interviews. The funders had no role in the design and execution of the study.

Limitations

This project faced several limitations. Findings are representative only of the respondent organizations and should be interpreted as indicative. Due to data sharing restrictions both at national level and within organizations, we were not able to conduct quantitative analyses of programmatic data to verify interview respondents' perceptions of impacts on screening, admissions, and program outcomes. Interpretation of qualitative data is subject to a degree of bias; we have attempted to minimize this through independent review of qualitative code application and interpretation. Qualitative findings are restricted to those who responded to requests for interview; we were therefore unable to gather substantive qualitative data for all adaptations identified on the survey. Few organizations responded to the May 2021 follow-up survey, limiting available information on adaptation duration and reasons for reversion. Finally, most interviews took place within a few months of adaptation rollout. Findings therefore strongly reflect experiences in the early stages of implementation and may not carry over for organizations in later stages.

FINDINGS

1. SUMMARY STATISTICS

Respondents submitted surveys representing 75 countries in North America, South America, Asia, and Africa. These responses included the experiences of 19 organizations running operational programs in 28 countries, and UNICEF's policies and guidelines in 70 countries. Furthermore, seven organizations submitted survey responses reflecting experience in running research projects or pilots on these adaptations in nine countries prior to the pandemic; these results are excluded from the summary data below.

Survey respondents reported implementing CMAM protocol adaptations during the pandemic in 69 countries; no adaptations beyond infection prevention and control (IPC) measures were implemented in six countries,¹ reportedly. Overall, the most commonly reported adaptations were Family MUAC and a reduced frequency of follow-up visits. The least commonly reported adaptations across all respondents were combined treatment of MAM and SAM and the use of low-literacy tools during community health worker (CHW) treatment of SAM. However, among organizations implementing operational programs, the use of one product to treat both SAM and MAM was the least commonly reported adaptation.

Table 2: Summary of adaptations implemented

	All Responses*	UNICEF Guidance	Operational Programs
Total Countries Represented	75	70	28
Family MUAC	46	38	24
Reduced frequency of follow-up visits	43	35	25
CHW treatment	30	23	9
One product	29	26	5
Modified dosage	26	16	13
Modified admission/discharge criteria	25	21	7
Combined treatment of MAM and SAM	9	0	9
Low-literacy tools for CHW treatment	7	0	7

**Number of countries with at least one respondent organization reporting implementation during the COVID-19 pandemic*

Given the dynamic nature of the pandemic, follow-up surveys were distributed to 20 partners² working in 26 countries to ascertain adaptation continuity. These surveys aimed to confirm whether adaptations reported in the first survey round were ongoing or discontinued and why; and whether new adaptations had been implemented. In total, seven partners working in 13 countries responded. Most respondents who indicated protocol changes during the first survey round answered that these adaptations continued during the second survey round; no respondents reported beginning any adaptations since the last survey round.

Within stage two of the project, the research team conducted 43 interviews with 46 individuals representing 19 organizations working in 20 countries (see Table 3).³ Of these individuals, three represented their organization or project at a global level; 25 held national-level positions (e.g., head of department, chief of party, etc.); and 18 held sub-national positions (e.g., program manager, nutrition associate, etc.). The sections below center the findings reported by these interviewees.

¹ Belize, Benin, Bolivia, Honduras, Namibia, Senegal

² Partners who submitted initial survey responses after January 2021 were not contacted to participate in the follow-up survey.

³ Out of the interviews conducted, two were excluded from the final analysis due to their focus on programming outside the scope of this project. Four audio recordings were corrupted and therefore only the written interview notes were used in the analysis.

Table 3: Organizations and countries represented in interviews

Organizations Represented	Countries Represented
Accion Contra el Hambre*	Afghanistan
Action Against Hunger India	Bangladesh
Action Against Hunger USA	Chad*
Action Contre la Faim	Democratic Republic of Congo (DRC)*
Action for Development	Ethiopia
Adventist Development and Relief Agency (ADRA)	India
ALIMA*	Jordan
Catholic Relief Services	Kenya
Concern Worldwide	Malawi
International Medical Corps	Myanmar
International Rescue Committee	Nepal
Kenya Red Cross	Niger*
National Drought Management Authority (NDMA)	Nigeria
Nigerian Women Agro Allied Farmers Association	Pakistan
Save the Children	Philippines
SRDA	Somalia
UNHCR	South Sudan
UNICEF	Tanzania
World Vision	Uganda
	Yemen

**Denotes organization interviewed regarding operational research on simplified approaches*

2. CROSS-CUTTING THEMES: ALL ADAPTATIONS

Decision-making Actors and Process

Influencing Factors

Interviewees noted several key factors impacting adaptation implementation decisions, including a desire to reduce crowding at health facilities; reduce physical contact between health staff and the general population; a desire to ease caregivers' burdens in the context of various COVID-related hardships; a response to COVID-19 caseloads and trends; government directives to suspend or halt services; a perceived absence of critical services linked to COVID-related lockdowns; and other operational considerations around COVID-19 IPC measures. More details about factors considered for each adaptation are found in the sections below.

Key Decision Makers

Key stakeholders involved in decision-making processes at a global level included primarily UNICEF and WFP – the primary policy and guidance agencies responsible for acute malnutrition management – with the World Health Organization (WHO) primarily providing guidance related to COVID-19-related IPC measures in facilities and at the community level. At the national and sub-national levels, Ministries of Health (MoH) were cited as the primary decision-making authorities, with potential adaptations or modifications requiring MoH approval before implementation. In certain contexts such as refugee camps, agencies like the UN High

Commissioner for Refugees (UNHCR) played an important role in the decision-making process, although they ultimately collaborated with host governments before implementing program changes. Several interviewees noted that different stakeholders were responsible for different activities, such as UNICEF for SAM treatment and infant and young child feeding (IYCF) services, and WFP for MAM treatment and blanket supplementary feeding programs. Another key player in several contexts was the state- and national-level Nutrition Cluster, which usually comprised of multiple relevant nutrition actors. Nutrition Clusters actively identified potential modifications and provided recommendations to government authorities for various challenges posed by COVID-19.

Consultation Process

For most adaptations, decision-making was a multi-step process requiring the engagement and buy-in of multiple actors. Interviewees frequently mentioned that the decision began at the cluster or technical working group level. Proposed modifications were sourced from either global-level guidance on CMAM operations in the context of COVID-19 or from on-the-ground observations on current trends in CMAM programs. These modifications would then be discussed, revised, and validated by technical working groups, sector working groups, Nutrition Clusters, or other bodies, who would then propose or present the adaptation to the Ministry of Health. After review, feedback, and eventual validation, nutrition practitioners would engage with relevant staff to ensure that their direct reports carried out the change.

One of the biggest takeaways was the importance of working through existing technical working groups and coordination groups. These mechanisms represent critical moments for collaboration, sharing of best practice, and gaining wider buy-in and engagement from the whole of the nutrition sector. Additionally, government buy-in and engagement is a key driver of these decision-making processes. One interviewee from Uganda commented, “Everything depends on the government for ownership and adaptation.”

While most interviewees noted overall alignment between NGO partners and government priorities, sometimes priorities diverged. In these situations, interviewees were obliged to maintain alignment with government guidelines. One interviewee in Tanzania noted that once they received MoH guidance, their team would discuss and compare with their regional office’s guidance to ensure alignment. Another potential source of tension was in the absence of clear national guidance. In Somalia, for example, one interviewee noted that while the MoH took the lead on COVID-19 related regulations and guidance, they left nutrition program adaptation decisions to implementing partners.

Adaptation Rollout, Orientation, and Training

Staff and Community-Based Workers and Volunteers

Organizations and governments across contexts largely used variations of cascaded approaches to inform stakeholders of the CMAM protocol adaptations and roll out changes. For example, an interviewee in Malawi reported that the MoH first sent a message to all district ministries and facilities to advise on the adaptations, then sent a team to provide training at facilities. Similarly, in Yemen, an interviewee said that representatives from the MoH and Nutrition Cluster and technical staff from the INGO trained both facility staff and community-based workers and volunteers to reduce the need for extremely busy facility staff to run the orientation and training.

Interviewees from other contexts reported a multi-tiered approach. In South Sudan, the MOH and nutrition technical working groups first developed and validated guidance, and then shared the guidance with partners during Cluster meetings for them to share with their own program staff. Interviewees from Uganda, Kenya, and Somalia reported that their organizations cascaded training and sensitization on the adaptations from county level to facilities to community-based workers and volunteers to caregivers.

Across contexts, the challenge of gathering restrictions drove innovation and flexibility in how orientation and training were provided. Multiple interviewees reported using Zoom or other video calling platforms to orient and train staff on the adapted protocols. An interviewee from Kenya commented that using virtual platforms for staff training could save scarce resources by eliminating such costs as renting out conference centers or hotels, transportation and food allowances. Others reported integrating the orientation and refresher trainings into routine supportive supervision visits and on-the-job mentorship. Interviewees from Kenya and the Philippines emphasized that, due to their intention to continue Family MUAC, specifically, beyond the pandemic, they integrated this training into routine activities.

Commonly noted strengths in rollout and orientation included building on existing pilots and trainings to maximize guidance dispersion among staff and community-based workers. Orienting experienced staff who had been working with the organization for a long time enabled a smoother rollout, according to one interviewee's experience in Myanmar. This finding underscores the importance of staff retention and training, particularly in situations that require rapid adaptation and flexibility. An interviewee from Kenya noted a shift from reliance on mobile national-level staff to county-level staff to provide trainings at facilities and in communities due to lockdowns and movement restrictions. Building more capacity at multiple levels in the long term could enable more efficient rollout in future situations. Regarding challenges, one interviewee from Tanzania relayed that orientation on the new adaptations was difficult due to the need to disseminate information to all levels as quickly as possible. Relatedly, multiple interviewees cited the challenge of not being able to conduct large or group trainings or orientation due to gathering restrictions, exacerbating the challenge of needing to roll out the new guidelines rapidly.

Caregiver Orientation and Training

Interviewees discussed various mediums for rolling out adaptations to communities and caregivers after staff orientation: discussions with community leaders and other key figures; community-based staff conducting household visits and small group gatherings; conversations at facilities during follow-up visits; care groups; and training of trainer models. Some interviewees reported using communication trees, text messages, WhatsApp videos, and phone calls to spread the word about the adaptations.

Interviewees reported numerous challenges in rolling out the adaptations to communities and caregivers. Restrictions on group trainings hindered rollout, driving the need for more, smaller trainings. Though several interviewees indicated that they used phone and video calls to contact caregivers, as above, others found this approach impossible in remote areas with limited networks or phone service. They therefore needed to conduct home visits. Such household visits were particularly difficult in sparsely populated areas, as reported by one interviewee in Tanzania. Community and household visits were initially hindered by a lack of personal protective equipment (PPE) and fears of staff or other workers coming to visit because of COVID-19 stigma. An interviewee from Tanzania said that the rapid imposition of lockdowns and restrictions, though useful in reducing infection spread, hindered rollout to caregivers. A final challenge was the increase in demands on community-based worker time to conduct risk communication and community engagement (RCCE) activities, which limited their ability to support on rollout, orientation, and training.

Strengths included first seeking acceptance and feedback from community leaders. Many highlighted the need to use multiple channels to engage with communities and caregivers from the beginning of rollout to maximize dissemination. Though interviewees reported that caregivers sometimes pushed back against the adaptations, integrating an explanation of the need for IPC measures to minimize COVID-19 transmission risks eased their concerns and brought more acceptance of the changes.

"Due to covid-19, we decided to do the training at the community level during our house-to-house visits. And the role of community leader was important because during the outbreak of COVID, it was not easy to get access to the communities because of the stigma ... Whenever they see someone is using any kind of PPE ... the response from the community was not positive in the beginning. But when we reached to the community leaders, community elders, through the imams from the mosques, they can pass this message to the communities. And it helped us a lot."

(NGO Practitioner, Yemen)

Logistics and Operations

Lockdowns and Transportation

One of the most common logistical challenges cited by interviewees was the widespread implementation of lockdowns and movement restrictions. These severely curtailed implementing movement of staff and materials to and within communities to conduct activities. Several interviewees noted that once national lockdowns were put in place, they were required to receive waivers and other temporary authorizations from various sub-national authorities to be able to travel, and further noted that multiple authorizations would be needed for any type of long-distance travel. One interviewee from Uganda noted:

"We wanted to have a training on baby-friendly health initiative in March. But ... the major setback was transport, the trainers were to come from Kampala ... [and] our vehicles didn't have waivers for all the districts that they're going to cross, so that training was pushed." (NGO Practitioner, Uganda)

Curfews also limited travel abilities. For one interviewee's organization in Kenya, curfews had a particular impact on travel to and from remote sites:

"In terms of the curfew ... you find that our field teams are traveling long distances, like four hours just to go to the outreach points. So if it's taking four hours to get to the outreach points, you need another four hours to come back." (NGO Practitioner, Kenya)

Interviewees discussed several strategies for working in the context of lockdowns. In multiple contexts, nutrition actors hired more staff living in the same communities in which they were working. An interviewee working with an NGO providing nutrition services in a camp in Cox's Bazaar, Bangladesh, recruited and provided a small stipend to additional Rohingya volunteers from the communities in which they worked, enabling continued services despite government-imposed lockdowns. In Myanmar, a pre-recruited pool of locally based staff allowed one NGO to continue operating even during strict government lockdowns.

Supply transportation also posed a challenge: international and domestic travel lockdowns impacted transportation of both necessary supplies and staff. Some interviewees noted, again, that they hired additional locally based workers to reduce the need for staff transportation. An interviewee in South Sudan noted that they experienced delays in receiving supplies because of reduced services provided by the UN humanitarian flight service. A final transportation challenge was the impact of required physical distancing measures on partners' ability to transport staff: to adhere to these regulations, partners had to hire additional vehicles so that fewer staff would be in a car at once, impacting cost considerations as well.

One potential long-term consequence linked to lockdowns that merits further exploration and analysis is the consequences related to caseloads and the global prevalence of malnutrition in areas where lockdowns occurred. One interviewee in India noted that in their context there were no services or distributions offered because of the lockdowns and that they were not allowed to travel to communities. They warned it would probably take months to be able to see the true impact of the lockdowns.

Prepositioning, Procurement, and Storage

As organizations were warned of impending lockdowns and restrictions to mitigate the spread of COVID-19, multiple interviewees noted that their organizations prepositioned supplies to preempt future challenges. Interviewees relied on speculation coming from government sources about potential actions, estimations of rising caseloads, and conversations with global guidance agencies such as UNICEF and WFP.

Multiple interviewees noted that they prepositioned approximately two months of supplies to handle potential supply chain ruptures or breakdowns linked to COVID-specific challenges. These supplies would

then be distributed to program participants based on a modified follow-up visit schedule (see section on “Reduced Frequency of Follow-up Visits” below).

“We were hearing that the camps could be completely sealed because the government feared, overcrowding, that if the infection had to go to the camps, we would have a real catastrophe. So we provided every facility two months’ of RUTF stock. ... yes, there would be problems in screening and admitting new children, but at least those who were in the program would not be abandoned.” (NGO Practitioner, Bangladesh)

A key enabling factor of prepositioning sufficient supplies to maintain CMAM programs is having adequate space to store them. Interviewees noted that their prepositioning capabilities depended heavily on the size of available warehouses. Another enabling factor was the presence of flexible and responsive supply chains, though this is an inherently challenging component of the emergency nutrition sector.

Shortages and Stockouts

Shortages and stockouts of supplies, while not a new occurrence for many CMAM programs, were often exacerbated by COVID-specific factors. Many interviewees noted shortages and stockouts of key supplies, such as MUAC tapes and therapeutic or supplementary foods (RUTF/RUSF) linked to movement restrictions, international procurement challenges and travel bans, and competing priorities for funding and resources. In Pakistan, one interviewee noted that while in principle nutrition actors there were well-positioned to weather international supply challenges due to their use of locally produced RUTF, they still faced stockout challenges because the formula relied on components that had to be procured internationally. These shortages eventually caused the interviewee’s NGO to have to stop admitting new cases to guarantee sufficient supply for already enrolled children.

3. FAMILY MUAC

Typically, Family MUAC interventions seek to increase early detection of acute malnutrition in children and encourage care-seeking behavior by their caregiver, thereby leading to improved treatment outcomes. In standard CMAM programs, CHWs conduct regular screening activities, either through periodic mass screenings, or through community- or household-level screenings. The Family MUAC approach trains caregivers, usually conducted by CHWs, to measure their own children’s MUAC at home, in areas with active CMAM services. Family MUAC was the most frequently cited adaptation made by nutrition implementers in response to COVID-19. The approach was seen as a low-cost and appropriate modification that would allow for continued nutrition screening services while still adhering to COVID-19 IPC measures. Overall, interviewees noted that the intervention was well received by community members, staff, and caregivers, with many noting buy-in from key stakeholders, such as government authorities. Interviewees believed that Family MUAC would continue to be a part of their routine programming after COVID-19, given its acceptability and relative simplicity to implement.

Decision-making Factors

Numerous factors influenced Family MUAC decision-making during the pandemic, namely the need to: (1) avoid physical contact between caregivers, children, and health care workers during nutrition screening activities; (2) respond to an anticipated increases in malnutrition linked to COVID-19 related consequences; (3) replace mass community screenings suspended due to COVID-19; (4) lower costs associated with reducing mass screening activities (reducing use of weight/height boards, reducing HR costs linked to mass screening activities); (5) respond to perceived or observed decreases in admissions trends and identify more cases of acute malnutrition; (6) comply with global guidance encouraging its uptake; and (7) identify acceptable alternative sources of data for existing surveillance systems.

Decisions on Family MUAC were typically made with multiple actors, including national MoH and sub-national government authorities, other nutrition NGO partners, and global and country-level UNICEF and WFP representatives. In select cases where Family MUAC was previously piloted or implemented in country, agencies recognized as leading experts were requested to lead decision-making processes, such as the Kenyan Red Cross in Kenya. In delocalized contexts where subnational government actors have significant agency to define implementation (such as county-level governments in Kenya), additional steps around contextualizing and adapting nationally issued guidance were frequently taken.

In most cases, there was general alignment between NGO priorities, cluster or technical working group recommendations, and government approvals. However, some interviewees noted differences (at least initially) between NGO partners and government policy. In India, interviewees reported that using MUAC as a diagnostic admission criterion has not been approved by the government, although it was temporarily permitted as a pandemic-specific regulation. In Ethiopia, interviewees noted that they were expecting new nutrition guidance (linked to COVID-19) from the government and anticipated that Family MUAC would be approved for use; previously it had not been authorized.

Finally, interviewees working in contexts with temporary government approval of Family MUAC expressed optimism that the pandemic presented an opportunity to collect data that could strengthen ongoing advocacy efforts.

“What I think is that we should collect the evidence, and this is the right time to present all the evidence to the government just to describe them that MUAC is the only effective tool when we are collecting data from the community ... I think we can do advocacy with the government.” (NGO Practitioner, India)

Rollout of the Family MUAC Approach

Rollout of Family MUAC typically followed a “cascade” model of training and awareness building. Most frequently, the first step was a Training of Trainers conducted by Family MUAC experts. Trainers would then conduct multiple trainings with health care workers or community health workers. These workers would then train community members and caregivers. Interviewees noted several modalities for delivering trainings, most commonly training of a select group from the community (e.g., care groups, lead mothers, and other community leaders). These groups would then train and inform their wider peer networks, small groups, or individual caregivers during house-to-house visits. Interviewees stressed that securing buy-in and engagement from staff at community health facilities and health posts embedded in the community was essential, as these are the health care workers most likely to be engaged with the community.

In most interviewee examples, Family MUAC was first targeted to a narrow population – e.g., caregivers with children already enrolled in a nutrition treatment program, women of reproductive age, caregivers active in existing care or other support groups – and then expanded to the wider community. Other strategies included identifying specific geographic locations with elevated acute malnutrition rates. While Family MUAC focuses on primary caregivers, interviewees in contexts such as Nigeria and India acknowledged that other family members, including fathers and grandparents, could engage with the approach, noting that the responsibility for monitoring children’s nutritional status should not rest exclusively with mothers. Interviewees noted the importance of having a trained health care worker engaged in the process to ensure consistently accurate messaging when working with care groups.

While most interviewees cited a successful Family MUAC rollout, some challenges were noted. There often lacked official government guidelines for rollout and robust monitoring systems to capture the adaptation’s impact on admissions and caseloads. Finally, some interviewees were concerned about potential breaks in the chain of knowledge transmission due to the “cascading” model of training. In other contexts where Family MUAC was a new approach nationally, some organizations faced challenges gaining buy-in and support from key partners and government agencies.

"The first challenge [of Family MUAC] was availability of new guidelines. Material had not been developed for rollout and all that. So then the task force at national level that works on the community activities was able to come up with the materials. Then the validation of this took time." (NGO Practitioner, Kenya)

Interviewees identified the importance of early integration of both existing health care infrastructure (local/community health posts and staff) and key village influencers. Family MUAC relies on existing treatment programs to capitalize on earlier identification of acute malnutrition, as well as a well-functioning cadre of health care workers to validate caregiver measurements, provide referral services, and conduct supervisory or refresher visits to caregivers. In Nepal, for example, a series of follow up visits to training participants was built into the training schedule. These were carried out strategically after the training to ensure knowledge and skill retention.

Caregiver Training and Response

Caregiver training represents a critical element for successful Family MUAC implementation. Interviewees noted several enabling factors for successful trainings. Training materials and messages should be simple and engaging, particularly important when training those with limited literacy skills. Additionally, acceptance and uptake of the approach is more likely to occur if trainers and trainees share the same language and cultural and social background. This facilitates deeper connections and is more likely to create trust between the trainers and the community.

"There will be external people, but it will be easier for us to penetrate the communities using the volunteers because they know better the languages and the culture of people. They know how to explain particular things, which maybe we wouldn't be able to explain ..." (NGO Practitioner, Uganda)

Family MUAC training inherently relies on proximity and sustained physical contact between health care workers, caregivers, and children; practitioners and trainers therefore identified creative solutions to complete trainings. Examples included using ripe fruit to recreate the feeling of edema, using dolls or recycling tissue paper rolls to practice using the MUAC measurement tape, and pre-recorded videos demonstrating proper technique. A notable challenge identified by interviewees was achieving the correct band tightness around a child's arm. Caregivers would frequently apply the tape too tightly, leading to an inaccurate measurement at home that would be later disconfirmed during a referral visit.

Several interviewees cited caregivers' initial resistance or reluctance to take up Family MUAC. The two primary reasons for this were an overall lack of confidence in their ability to take correct measurements and a general expectation that community-based workers were responsible for measuring children.

"Initially, when we started, most of the mothers would say 'This is not our work. This is the work of frontline workers to measure our child. Why [would] we do this?'" (NGO Practitioner, India)

However, interviewees encountering this initial difficulty also mentioned that, due to its simplicity, Family MUAC was quickly accepted. One interviewee working in Nigeria noted that in their area of operations, there is widespread hesitancy from the community directed toward most health interventions. Despite this, the community quickly came to respond positively to the Family MUAC approach. Interviewees noted that caregivers appreciated the availability of additional information and being equipped with tools that allowed them to monitor and respond to their children's nutritional status at the household level.

Staffing

Most interviewees indicated that their staff greatly appreciated Family MUAC, particularly the elements of knowledge transfer and community member capacity building. Specifically, staff noted that the approach builds greater ownership of and inclusion in the management and detection of acute malnutrition by the wider community. For example, in the Philippines, the opportunity to learn a new skill set created excitement in a cadre of community health volunteers (CHVs) that had not previously had access to those skills, leading to improved follow up and engagement with the community.

"My team and I saw how the health workers became more interested in doing management of acute malnutrition. When we involve the barangay health workers [community health volunteers] ... they were more active in terms of reaching out to these parents and families with children who are wasted." (NGO practitioner, Philippines)

Regarding staff responsibilities and workload, interviewees generally agreed that Family MUAC reduces CHW workload related to screening activities. However, they also noted that CHWs do not necessarily therefore have more free time to allocate to other activities. Rather, by shifting measurements to caregivers, they assume additional responsibilities for caregiver follow-up, outreach, refresher trainings, and supervisory visits. Additionally, CHWs play an important role in validating caregivers' measurements within communities in models where caregivers bring their children to a CHW prior to visiting a facility.

Despite the overall acceptance of Family MUAC, interviewees flagged some concerns. First, appropriate and enticing incentives for CHWs remain a key barrier. CHWs are active in training caregivers, verifying measurements, validating referrals, and monitoring or supporting caregivers. Yet, they often receive no additional payment or incentives for the additional responsibilities. In Uganda, there was initial tension and resistance between different cadres of health workers around shifting responsibility for screening: CHWs were concerned that they would no longer receive incentives linked to screening and referral services.

"Then, in some places, there is clashing of the village health worker and the volunteer: 'You're taking up our work, we are supposed to do nutrition screening. Why have you been offering it?' ... But still, there's that natural feeling of, I'm the one who's supposed to be doing this, why are you doing it, especially where there is a motivation attached to it." (NGO Practitioner, Uganda)

Additionally, interviewees noted that their staff expressed concerns about mixed accuracy of caregiver measurements. At the time of the interviews, most interviewees did not have readily available programmatic data on measurement accuracy of cases referred to health facilities. Anecdotally, however, estimates varied significantly between contexts and the length of time since training, ranging from 30% to 70% accuracy of referrals. A key learning was the need for continual monitoring and refresher visits for caregivers, including point-of-service refresher trainings for caregivers who incorrectly self-referred their children. As one interviewee in Uganda noted, the intervention was "easy to learn, but easy to forget."

"We keep monitoring to keep refreshing the information, because we agree that taking MUAC is very easy to learn, but also easy to fail." (NGO Practitioner, Uganda)

This need for continued supervision and refresher training also aligns with another key finding: the need for Family MUAC to be integrated into existing health systems to ensure continual caregiver support. Interviewees noted that this point of interaction between staff and caregivers is a critical moment in keeping caregiver motivation and engagement high, especially if caregivers present with inaccurate measurements. A refusal of admission for an inaccurately referred child may dissuade future health-seeking behaviors without retraining and encouragement.

"And because what we want to avoid as much as possible is caregivers referring false positives, ... because this thing would result in a lot of disgruntlement by the caregivers, if they see that their children are not being admitted or not being treated." (NGO Practitioner, Malawi)

Logistics and Cost Considerations

Like with many other commodities during the pandemic, shortages and lockdowns played a significant role in Family MUAC implementation. A primary challenge cited by interviewees was a general shortage of MUAC tapes. Compounding shortages was the length of time needed to procure more tapes. Interviewees cited other procurement challenges, namely navigating the occasional overlapping and sometimes unclear lines of responsibility around procurement. In some contexts, UNICEF was cited as the primary organization responsible for procuring and distributing tapes, while in other contexts organizations were responsible for procuring the tapes themselves, often in large quantities. COVID-19 related lockdowns, travel restrictions, and other regulations also slowed down the procurement process, as cited by an NGO in Yemen.

“We were having a big challenge to get the MUAC tapes in the country and due to the COVID, there was a big issue to receive the supplies from outside. And yes, so we were really struggling to get the MUAC tapes to implement the MUAC training because we have a target of 24,000 beneficiaries.” (NGO Practitioner, Yemen)

Interviewees also noted several cost and budgetary implications associated with Family MUAC. Interviewees in Kenya and Yemen also noted that training costs had increased due to COVID-related restrictions on group sizes, noting that more training sessions were needed (with associated costs) to reach the same number of people. These had not been accounted for in pre-COVID budgets. However, virtual trainings conducted at higher levels reduced some training-related costs, as mentioned earlier. When CHWs in Yemen offered feedback that additional travel costs were necessary for increased trainings, steps were taken to make these allowances available in the future. An increased reliance on Family MUAC also had a different budgetary implication for organizations in Kenya, where Family MUAC had been previously implemented. Essentially, the COVID-19 pandemic accelerated implementation, to the point that it became a standard component of proposal development, with necessary funds (purchasing tapes, training expenses) routinely included in project budgets.

Monitoring and Evaluation

While Family MUAC was a widely implemented approach, associated systems of monitoring implementation and impact lagged in both maturity and spread, according to interviewees. Many interviewees also cited challenges with linking the approach to specific outcomes within their programming, such as cure rate or average MUAC upon admission. There were, however, several examples of functional monitoring and robust data collection systems. In Malawi, for example, a joint UNICEF-University of Malawi Family MUAC intervention conducted routine assessments and evaluations of caregiver referral accuracy, and incorporated findings into future trainings and follow ups. The interviewee noted, however, that these activities were covered under operational research and would not be financially sustainable long term.

In more routine programming contexts, such as one described by an interviewee in Uganda, the following system was used to collect monitoring data. CHVs maintained a register with information such as the number of children screened and cases identified. However, this approach often faces challenges with insufficient supervisors to check data entry and ensure data quality. One interviewee in South Sudan noted that they simply did not have the necessary infrastructure to collect data on children being referred through Family MUAC, although they were hoping to build this capacity and report to the state-level Nutrition Cluster. This interest in capturing better data on referrals from Family MUAC was also noted by an interviewee in Kenya, who wanted to see additional CHW tools developed facilitate the collection and integration of this data into their integrated management of acute malnutrition (IMAM) program.

When asked which indicators would be useful, interviewees cited the following: caregiver measurement frequency and measurement accuracy (i.e., percent of measurements interpreted correctly as verified by staff or CHWs); successful enrollment (i.e., the percentage of caregiver-referred children who were both eligible and enrolled); the percentage of enrolled children referred by caregivers as compared to CHWs; and qualitative data (at least in the formative or pilot stages) to capture caregiver feedback, challenges, and

suggestions. Additionally, they recommended that indicators should be added to standard reporting mechanisms and forms to encourage routine collection of Family MUAC data.

Other challenges cited by interviewees in collecting monitoring data on the Family MUAC approach centered around COVID-19 restrictions, such as movement restrictions, government-mandated lockdowns, and shortages of PPE that prevented CHVs from visiting households to conduct trainings or follow up visits.

Using Family MUAC to support community nutrition surveillance

A unique application of Family MUAC and monitoring was noted in Kenya, where pre-COVID, the National Drought Management Authority (NDMA) operated a series of community sentinel sites that collect data to inform early warning systems for drought and food insecurity, and collects MUAC data from participating households to inform their predictions. As part of their response to COVID, the NDMA integrated existing CHVs operating within their surveillance sites in order to combine data being captured with existing facility data to paint a more comprehensive picture of the nutritional status of children in those areas. Additionally, the NDMA adjusted its data collection methods to reflect the color-coded diagnosis system (Red-Yellow-Green) of determining nutritional status in order to harmonize data across the two sources. The NDMA was also able to draw on its sentinel monitors (a cadre of health workers separate from CHVs) to support in conducting monthly follow up and training visits for households trained on Family MUAC.

Program Performance

Family MUAC was cited by multiple interviewees, representing a variety of contexts, as an acceptable strategy for replacing community mass screenings in the context of COVID-19 related restrictions. This occurred in such diverse contexts as Uganda, India, Yemen, Tanzania, Somalia, and Kenya. In some contexts, such as Bangladesh, Family MUAC was implemented to supplement existing mass screening services, rather than replace them entirely.

Overall, interviewees noted anecdotally Family MUAC increased program admissions. Multiple interviewees observed that while COVID-19 restrictions had reduced admissions, they perceived an increase after Family MUAC implementation. However, this was not a universal response: one interviewee in Jordan noted that they had not seen increased admissions due to Family MUAC. They did acknowledge several potential explanations hindering caregiver-driven referrals, including distance to facilities and closures of some facilities during the pandemic, which limited early identification and referral.

One interviewee in Kenya identified a troubling potential consequence of increased cases identified through Family MUAC. While the approach was useful in replacing suspended community mass screenings and minimizing missed acute malnutrition cases, cases could be identified in areas with limited treatment options, particularly for MAM cases in contexts without TSFPs. This presented an ethical challenge of screening for a condition for which there would not be available treatment.

Anticipated Duration

Most interviewees believed that Family MUAC would continue to be implemented beyond the pandemic, even if other adaptations eventually reverted to standard protocols. They also noted that Family MUAC is being discussed in a variety of coordinating mechanisms and fora; they see increased resources shifted toward Family MUAC; that caregivers value it and pick it up with relative ease; and that nutrition implementers value the approach as well.

"I think Family MUAC is the way to go. what I've seen is that caregivers want to be empowered and they have the best interest for their children." (NGO Practitioner, Kenya)

Even in contexts with limited government buy-in toward the approach, interviewees expressed confidence that the value and impact of Family MUAC, for both emergency and routine programming contexts, would eventually earn the government's confidence and gain wider approval.

From the follow-up survey responses submitted in May 2021, seven partners in 10 countries initially indicated use of Family MUAC; of these, all were continuing the approach as of March 2021. One respondent from Somalia anticipated that Family MUAC would continue beyond the pandemic because "it is simple and can be done at home by caregivers [and] it improves timely identification of cases." Another respondent working in the Philippines commented that Family MUAC would continue as it was officially adopted by the National Nutrition Council as part of growth monitoring and promotion (GMP) programming.

Lessons Learned

Interviewees noted several key takeaways from their experiences implementing and overseeing Family MUAC. First, organizations should procure sufficient tapes before any training or distribution activities begin, as shortages can hinder the rollout or scale up. Special attention should also be paid to the training delivery, both in terms of the tools used and their fit within local contextual factors. Trainings should factor in CHW and caregiver literacy levels and strive to make trainings engaging to maintain interest. In Nepal, for example, caregivers were provided with image-based refresher cards to use for reference after the training, including reminders on how to take measurements or what to do once measurements were taken.

One of the most compelling lessons learned from the implementation of Family MUAC was the need to ensure a strong and sustainable buy-in and engagement from health care workers, starting with the trainings. As multiple interviewees noted, health care workers can either encourage or discourage caregivers from continuing to practice desired care seeking behaviors associated with Family MUAC. Key roles in this process include validating caregiver measurements and providing appropriate counseling and guidance services. This role is even more important when there are significant opportunity costs involved for caregivers to bring their children to the facility.

"One of the things that we have learned is about adequate sensitization of all the stakeholders, because we are realizing that if we do not involve the relevant stakeholders, even at the community level, say you train the caregivers and leave out the CHVs, there could be misinformation ..." (NGO Practitioner, Kenya)

An additional challenge that practitioners faced was teaching mothers to properly take measurements with the MUAC band. Well-structured and clear training on how to properly take measurements, and appropriate support structures (both at the community and facility level) to continue to train or guide caregivers after trainings were two key factors identified by interviewees to face this challenge.

"What they'll do is that they take the measurements wrongly sometimes. They will, you know, tighten the tapes ... And that's one of the trainings that is done so that you don't take so tight or too loose. Just to ensure that the tape is just right at the skin." (NGO Practitioner, Kenya)

Overall, interviewees noted that Family MUAC, especially in the context of COVID-19 lockdowns, and other types of restrictions, proved to be an appropriate and widely acceptable alternative to community mass screenings as well as a useful additional tool to be deployed to ensure that acutely malnourished children needing treatment were not missed. While several concerns around Family MUAC were noted by interviewees – missing children who would be diagnosed as acutely malnourished through MUAC measurements; challenges associated with reaching and maintaining contact with highly mobile populations; and unclear or poorly defined government regulations regarding MUAC as a sole diagnostic criterion – the benefits of the approach was largely agreed to outweigh these concerns. When implemented well, interviewees noted that Family MUAC turns caregivers from passive recipients of nutrition services for their children into empowered caregivers with the required knowledge, skills, and tools to successfully manage their child's nutritional status from their own homes.

4. MODIFIED ADMISSION AND DISCHARGE CRITERIA

Under standard protocols, three criteria are used for admission to CMAM programs: MUAC, weight-for-height Z-score (WHZ), and edema. During the COVID-19 pandemic, two adaptations to these criteria were made: (1) suspending the use of WHZ as an admission criterion and (2) increasing the MUAC threshold for admission eligibility. In the former case, calculating WHZ requires a weight and height measurement, which involves significant and prolonged proximity and contact between staff and children. To reduce exposure and potential COVID-19 transmission risk, several governments and implementing organizations suspended weight and height measurements at health facilities, relying instead on MUAC and edema only for admissions (reported by interviewees from Bangladesh, Ethiopia, South Sudan, Tanzania, Uganda). One interviewee in Uganda reported that they suspended height measurements but continued to take weight measurements for immunizations and to monitor pregnant women's growth. Another interviewee in Tanzania emphasized that it was easier to sanitize MUAC tapes than height boards and weighing scales; therefore, they shifted their screening measures from WHZ to MUAC. Indeed, several interviewees commented that the suspension of WHZ took place alongside strengthened and intensified Family MUAC and house-to-house community-based screening, with use of PPE and IPC measures (reported by interviewees in Bangladesh, South Sudan, Tanzania, Uganda). In other contexts, the MUAC thresholds for admission eligibility were expanded to compensate for the suspended use of WHZ (reported by interviewees in Bangladesh, Uganda, Ethiopia), since MUAC and WHZ do not always identify the same children as malnourished (9,10).

Decision-making Factors

Some interviewees reported contentious discussions around suspending weight and height measurements: some governments and implementing organizations were concerned that this would exclude children with acute malnutrition identified by WHZ but not MUAC from receiving treatment. Interviewees from Somalia, for example, reported tension between recommendations from the Nutrition Cluster and the Ministry of Health as to the optimal way forward. In both Somalia and Kenya, the decision was ultimately taken to continue monitoring weight and height to capture more children. As guidance recommending suspension of weight and height was developed in South Sudan, one interviewee recounted debates as to which metric (WHZ versus MUAC) would capture the most, and the most vulnerable, children, given children's typical body composition in that context.

To address concerns of excluding acutely malnourished children, some interviewees reported discussions around expanding the MUAC threshold for admission to OTP/TSFP. All indicated that decisionmakers conducted analyses of existing program data and previous screening surveys (e.g., SMART surveys) to identify optimal MUAC thresholds to capture otherwise excluded children. Determining thresholds was particularly challenging in contexts with high discordance between levels of acute malnutrition identified by WHZ and MUAC. At the time of interview, some interviewees commented that discussions on expanding the thresholds were still underway.

Another decision-making factor impacting decisions on expanding MUAC admission thresholds was access to necessary resources and budget to accommodate any increase in caseloads from abruptly altered admission criteria, as increasing the threshold could identify more acutely malnourished children despite still excluding some of those identified via WHZ (11). In Ethiopia, an interviewee estimated that raising the threshold could increase consumption of therapeutic foods up to 30%. This would require increased supplies, resources, and budgets, which weighed heavily on decision-making; the decision depended on procurement of adequate supplies and resources. In Bangladesh, one interviewee reported that the threshold had increased from 11.5 to 12.0cm for OTP and 12.5 to 13.5cm for TSFP; however, they adjusted the TSFP admission threshold down to 13.0cm when caseloads exceeded capacity and supply availability.

SUSPENDED ADMISSION CRITERIA

Rollout, Training, and Community Acceptance

Once WHZ was suspended as an admission criterion, staff were trained on the revision both through general trainings as well as continued mentoring and spot checks. As with Family MUAC, interviewees reported training and communication challenges due to gathering restrictions. Some reported that children admitted by WHZ prior to the change continued to be monitored by WHZ, which initially caused some confusion among staff and caregivers. Despite these challenges, one interviewee from South Sudan reported that staff were relieved by reduced physical contact and transmission risks with patients during the pandemic.

In interviewees' experience, caregivers were informed of the admission criteria changes at facilities, through care groups and other support groups, and small community meetings. One interviewee in Uganda reported that caregivers were particularly receptive to the suspended weight and height measurements because a MUAC measurement is an easier, less distressing experience.

"They are a bit happy because they don't have to do the weight-for-height because their babies used to cry a lot during that." (NGO Practitioner, Uganda)

Operational Implications

Interviewees often reported that suspending weight and height measurements eased staff's workload, with positive feedback on the change. However, one interviewee conveyed that other adaptations, an increase in case severity due to delayed presentation for treatment and contextual exacerbating factors, and increased reporting requirements increased staff's workload; this was somewhat balanced by the reduced workload from fewer anthropometric measurements. One interviewee whose organization continued weight and height measurements observed an increase in staff's workload and wear on the weighing scales and height boards from increased cleaning during the pandemic. Finally, two interviewees from DRC (supporting a research project on MUAC-only programming) and Ethiopia commented that eliminating weight and height measurements reduces demand for heavy and expensive weighing scales and height boards, while increasing community-level demand for MUAC tapes.

"For them, [suspending WHZ] has been like a reduced workload. The response, I can say, it has been positive, because when we are conducting MUAC it is a bit easier than doing again the weight-for-height and then taking Z scores, because the MUAC is more simple." (NGO Practitioner, Tanzania)

Program Performance

Anecdotal reports from Somalia and South Sudan indicate that suspending WHZ without concurrently increasing MUAC admission thresholds was associated with notably decreased admissions. One interviewee in South Sudan estimated a reduction of 20% from previous years, while another commented that they had only met 50% of their anticipated targets for 2020 thus far. They hypothesized that suspending WHZ impacted some children's eligibility for treatment, thereby impacting admissions and caseloads. However, interviewees also proposed that other factors could be simultaneously driving reduced admissions, including fear of visiting facilities and suspended community-based screenings and referrals.

"Because we are not currently using weight-for-height, whereby you can admit many children, then using MUAC only as the admission criteria has given us a negative impact into our program's admission, especially the admission trend. ... A lower level of admission trend doesn't mean that malnutrition has gone out from South Sudan... The malnutrition is still there. And it has been growing worse because of some conditions under this COVID-19 pandemic." (NGO Practitioner, South Sudan)

Interviewees were concerned that shifting to MUAC would identify some children as having MAM who would otherwise have been categorized by WHZ as having SAM; therefore, they may not receive the appropriate intensity of treatment. An interviewee from South Sudan noticed deterioration in children admitted to TSFP by MUAC who may have otherwise been admitted to OTP by WHZ. They also provided anecdotal reports of a reduced recovery rate and increased relapse, though they reiterated that other intervening factors could drive these observed associations.

"Some children deteriorated from MUAC because they are SAM cases but admitted as MAM in TSFP program. We have supplementary feeding, then sometimes they end up deteriorating and later being referred to the OTP program, whenever the MUAC deteriorated and whenever they also develop medical complications. We end up transferring such children from TSFP to our stabilization center because of such a kind of a negative impact being realized during this COVID-19 response." (NGO Practitioner, South Sudan)

Anticipated Duration

Regarding adaptation duration, most interviewees suspending WHZ only indicated that they anticipated restarting this criterion after the pandemic due to concerns about missing vulnerable children. One interviewee from Bangladesh, where the MUAC threshold was increased, indicated that the decision would depend on program performance and COVID-19 transmission risks, though staff had adjusted well to the revisions. Finally, an interviewee from Somalia commented that they had already returned to using WHZ after an initial suspension due to threat reduction and adherence to IPC measures.

"We lose out on some children if you're not doing weight for height. So once things get back to normal, I feel that it may go back, but I don't know still what would be the decision of the Ministry or the Cluster. It's going to be a joint decision." (NGO Practitioner, South Sudan)

Lessons Learned and Conclusions

Most reported lessons learned from suspending WHZ were derived from two interviews with individuals conducting research studies using MUAC- and edema-only admissions in Kenya and the DRC. A representative of the DRC research project noted their staff identified fewer errors in taking MUAC measurements than with taking weight and height measurements and then calculating WHZ. They also commented that a MUAC threshold is easier to explain to caregivers than WHZ. Finally, the interviewee said that staff found it easier to train staff and CHWs on MUAC measurements than WHZ, especially in human resource-constrained settings.

Despite these successes, questions remain regarding the optimal criteria to capture vulnerable children, as expressed by the interviewees who anticipated resuming WHZ. These debates echo ongoing global-level conversations about how to ensure that program admissions criteria target children most at risk of mortality or severe illness due to acute malnutrition.

EXPANDED ADMISSION CRITERIA

Rollout and Training

As with suspending WHZ for admission, interviewees responded that caregivers were oriented on an expanded MUAC threshold primarily at health facilities. Furthermore, one interviewee noted that their organization had also communicated with care groups, since lead mothers are a critical source of community-based referrals. One organization in Uganda rolling out Family MUAC simultaneously, however, did not train caregivers on the expanded thresholds, as tapes did not reflect the new criteria and they were concerned about confusion. Elsewhere, children admitted based on standard MUAC thresholds remained in the program to which they were initially admitted, while revised thresholds only applied to new admissions.

Operational Implications and Program Performance

Across contexts, expanding the MUAC threshold for admission increased caseloads, which increased demand on supplies and resources. However, this expansion did not necessarily capture all children otherwise eligible by WHZ. An interviewee from Bangladesh observed that some children admitted under the new thresholds may not have qualified under standard criteria, though they preferred to admit too many rather than exclude children. However, they cautioned that it was not possible to confirm this since that weight and height measurements were not taken.

"Increasing the cutoffs again helped us enroll more children. And even if there were some children who may not be SAM or MAM with this increased cutoff, at least we are not doing any harm to them." (NGO Practitioner, Bangladesh)

Despite the increased caseloads, interviewees reported limited impact on program performance. One interviewee noted anecdotally that the expanded discharge threshold increased children's length of stay and reduced cure rates during the first few months of implementation. This is perhaps unsurprising, as children would require a longer treatment period to reach an increased threshold. The interviewee said that their organization addressed this challenge by improving outreach, monitoring, and household visits to ensure that caregivers had adequate support and adhered to treatment protocols.

"The first months we faced a few problems: the number of discharges reduced, the cure rate was reduced, but gradually it's OK. Because of the extended MUAC discharge criteria some beneficiaries, they [were admitted] on less MUAC and it was difficult to raise them for discharge, but now it's OK." (NGO Practitioner, Bangladesh)

Anticipated Duration

Interviewees' feedback on anticipated duration was mixed. One interviewee reported that the duration of using an expanded admission threshold was uncertain. Initial pushback from staff subsided once they became accustomed to the change. They also said that their organization was confident that the expanded threshold combined with increased screening measures would reach most children in need of services, therefore also reducing the pressure to revert to standard protocols. Conversely, an interviewee from Uganda believed that they would only continue with the expanded at-risk category while weight and height measurements were suspended.

"From what we are getting now with the changed MUAC criteria, the admissions are happening and with, you know, increased screening in the community, by the Rohingya volunteers and the Mother-led MUAC, so what we have seen is a certain improvement in the admissions in the OTP and TSFP. So even if we are continuing with these, I think we will be reaching a large majority of children with acute malnutrition." (NGO Practitioner, Bangladesh)

Lessons Learned

Overall, interviewees commented that expanding the thresholds enabled continued enrollment of nutritionally vulnerable children with suspended WHZ. However, an interviewee in Uganda noted a challenge related to the perceived vulnerability of children admitted under the expanded admissions criteria. They commented that some staff and some community members did not view the children admitted as "at risk" (e.g., MUAC < 12.9cm) to be as vulnerable as others. This may impact quality of care as staff prioritize the children they perceive to be at higher risk of morbidity and mortality.

Another concern noted by interviewees was that the categories on existing color-coded MUAC tapes used for community-based screenings do not align with a revised MUAC threshold. This posed challenges in training caregivers on Family MUAC when thresholds were increased. One interviewee in Bangladesh reported that they had hand drawn lines on each MUAC tape to show the new cutoffs, though this labor-intensive approach may not be an option elsewhere.

5. REDUCED FREQUENCY OF FOLLOW-UP VISITS

Under standard protocols, children with SAM typically return to facilities for monitoring and therapeutic/supplementary food distribution on a weekly basis, while children with MAM often return biweekly. During the COVID-19 pandemic, governments and organizations adjusted these frequencies to reduce crowding at facilities and minimize risk of transmission. The research team interviewed staff from 12 countries who had implemented this adaptation: Bangladesh, Ethiopia, Jordan, Malawi, Myanmar, Nepal, Pakistan, Somalia, South Sudan, Tanzania, Uganda, and Yemen.

Within these examples, interviewees most often reported that they shifted the frequency of follow-up visits for children with SAM from weekly to biweekly, and for children with MAM from biweekly to monthly. Interviewees from two countries (Myanmar, Somalia) reported scheduling appointments, while one in Tanzania reported extending facility opening hours and days. Extended time between visits was also often coupled with Family MUAC training and increased home visits and defaulter tracing (using PPE).

Decision-making Factors

The primary factor driving reduced follow-up visits was the need to enable social distancing at facilities by reducing the number of people coming each day. One interviewee also indicated that this accommodated caregivers' fears of contracting COVID-19 at facilities by requiring them to visit less often. Movement restrictions and lockdowns also motivated this change as transportation options for caregivers declined and costs rose. In one refugee camp setting in Ethiopia, the adaptation was necessary due to reduced staff availability at facilities: social distancing measures mandated fewer passengers in each vehicle transporting staff to and from camps, thereby constraining the number of staff at facilities.

Adjusting the schedule for children with SAM in OTP was sometimes contentious. Staff were concerned that children with weakened immune systems could deteriorate quickly without proper and prompt medical attention. In a refugee camp in Ethiopia, for example, staff initially adjusted OTP visits to biweekly, but reverted when they saw deterioration among some children. In Tanzania, one organization determined the frequency of follow-up visits on a case-by-case basis according to the severity of a child's case and any comorbidities, requiring more frequent visits for sicker children and reducing frequency as a child improved.

Rollout and Training

Decisions about adjusted schedules were most often cascaded to program staff through standard communication mechanisms. Interviewees reported that program staff informed caregivers by first engaging with community and local leaders to explain the change and secure support. In addition to discussions during facility visits, caregivers were informed via visits from CHWs, socially distanced care group meetings, and individual phone calls and text messages. Staff emphasized the need to reduce COVID-19 transmission risks via social distancing, which strengthened acceptance. In Somalia, strict government follow-up on adherence to social distancing measures also reinforced uptake.

Caregiver and Community Response

Overall, interviewees indicated that changes were well accepted by communities and caregivers. Staff relayed that caregivers appreciated fewer visits to facilities due to their fear of contracting COVID-19 and perceptions that facilities are high-risk locations. They also indicated that this adaptation somewhat alleviated challenges associated with competing household responsibilities, increased transportation costs, and traversing difficult terrain, key barriers to treatment access. While some caregivers were concerned about reduced monitoring of their children throughout the program, in one context staff ensured access to nurses and other medical staff between visits if caregivers suspected deterioration. This interviewee noted that caregivers' confidence in staff capacity influenced acceptance.

Conversely, less frequent visits meant a larger ration distribution at each visit (e.g., a ration of 28 sachets, or two sachets/child/day for two weeks, instead of 14 sachets, or two sachets/child/day for one week). Interviewees reported that some caregivers struggled to store this increased ration, particularly in refugee camps setting with limited space, and ensure proper dosage for the ration to last the full time between visits (discussed further below). One interviewee described how some children who were not enrolled in OTP/TSFP would take the ration while the caregivers were away from home, challenging their ability to make the ration last between visits. Proposed solutions included storing the rations out of children's reach or providing locked boxes in which to keep the supplies; neither assured complete security.

Staffing and Workload

Impacts on staff workloads varied between contexts. Some interviewees reported that reduced crowding at facilities alleviated facility-based workloads. In one context, staff therefore dedicated more time to community engagement activities such as Family MUAC rollout, RCCE, and absentee or defaulter tracing. Elsewhere, interviewees commented that the reduced follow-up visits did not increase or decrease workload, but instead spread it out. In Somalia, scheduling (less frequent) appointments for caregivers lengthened the working day, since caregivers usually arrived around the same time in the morning. In Tanzania, the number of days during which children could come to receive treatment expanded, meaning staff were engaged at the facility during more days, though overall workload remained level. One interviewee working in Uganda said that workload for community-based staff expanded due to increased absentee/defaulter tracing and the need to disseminate messages and appointment information door-to-door, rather than in a large gathering of caregivers.

"Staff spent less time at the nutrition sites or at the facility, but they actually get more time to be in the community, like to roll out the Family MUAC approach and also follow up of absentees to reduce defaulters. I can say it had a positive impact on staffing since the workload has reduced." (NGO Practitioner, South Sudan)

"By midday most of the beneficiaries would have left and only emergency services and those seeking health services would come in the afternoon. But now since they've had the social distancing measures, we've had to had [staff] engaged for the whole afternoon." (NGO Practitioner, Somalia)

Logistical Implications

Impacts on supply chain management and logistics were primarily felt during rollout. Some interviewees commented that increasing the ration distributed at each visit quickly depleted available supplies, as forecasted needs and supply requests previously relied on weekly or biweekly calculations. They also reported a delay in receiving additional supplies due to COVID-related international supplier challenges. At first, one interviewee reported needing more vehicles to transport supplies, and more staff for supply chain management, including transportation, loading and unloading, and security for storage areas. Later, however, another interviewee reported more streamlined stock management due to improved forecasts and the ability to procure more supplies at once when facing movement restrictions. Another interviewee remarked that despite initial adjustment challenges, ultimately the amount of product distributed in a month remained the same, but just distributed differently. Flexible supply chains and contingency plans were cited as key enabling factors to ease the transition to less frequent but larger distributions.

"We need more vehicles to transport from the main store to the different distribution points for sure. For example, in a camp where we are running, we have two vehicles to transport to different distribution points, and if we start to double the blanket and moderate distribution, we need two more vehicles... In the same way, in different places, there will be more logistics and transport needs, not only for supplies and staff, like I've said already, and also we need more supply and more storage areas." (NGO Practitioner, Ethiopia)

"Due to this change in protocol, our supplies were consumed quicker and even though we placed international order of more supplies well in advance ... international suppliers took longer than usual and therefore our supplies went into a delay." (NGO Practitioner, Pakistan)

Monitoring and Evaluation

Interviewees provided limited feedback on monitoring and evaluation protocols specific to a reduced frequency of follow-up visits. One interviewee confirmed that their organization continued to use standard monitoring procedures and methods. However, another individual expressed concern about accurate record keeping with the infrequent visits: for example, with fewer data points, it may be unclear whether a decrease in a child's MUAC is a result of incorrect measurement from the previous visit or a sign of deterioration between visits. Finally, one interviewee suggested adding a psychosocial evaluation and qualitative research component on caregiver well-being and preferences to assess this adaptation.

Program Performance

Anecdotally, some interviewees indicated an overall reduction in caseloads, potentially due to confusion around changed schedules or fear of COVID-19 inhibiting healthcare seeking behaviors. One interviewee reported increased admissions of severe cases to the local stabilization center (SC) due to reduced opportunities for clinical assessment and monitoring.

"You're getting more negative impact on poor adherence because people are falling sick [between facility visits] ... Previously, they would come and tell you, 'I am feverish', and you would lead them to services immediately. But this time they come at once for the refill and also for treatment, [and regressed] somehow, somewhere, especially where there is malaria and loss of appetite or diarrhea." (NGO Practitioner, Yemen)

Concerns about deterioration for clinically vulnerable children between visits were widely reported. Proposed reasons included sale or sharing of increased rations, improper dosage adherence, or delayed identification and treatment of common comorbidities such as malaria, diarrhea, and pneumonia. Some interviewees addressed this by following up with severe cases with health conditions between facility visits either via home visits or phone calls. However, COVID-19 movement restrictions hindered home visits in some contexts. Furthermore, one interviewee did not believe that community volunteers responsible for conducting home visits, were sufficiently trained to identify and refer medical complications. Additional training on danger signs of common comorbidities may address this concern.

Some interviewees were also concerned about perceived increased defaulter rates. However, it was unclear whether these resulted from caregivers' confusion around or rejection of the changes in follow-up visits or from increased movement restrictions. One interviewee emphasized the need for consistent caregiver engagement to encourage follow-up visits, and to communicate with local government authorities to allow them passage to receive services. Increased community-level follow-up and communication and counselling on health-seeking behaviors reportedly improved referral and defaulter rates according to one interviewee.

Finally, interviewees generally reported perceiving an extended length of stay in the program for enrolled children. This may be due to sale or sharing of rations, incorrect dosage, or deterioration. However, further program data analysis is necessary to understand whether this is a default consequence of increasing time between visits or a result of slowed progress through the program. This has operational implications: one interviewee connected an increased length of stay to increased stock consumption per child, which could impact supply chain management and costs in addition to inferior outcomes for enrolled children.

"For example, a child who has just come to the OTP... Instead of that child being reviewed after one week, that child needs to be reviewed after two weeks. Therefore that child will likely stay in the program for additional more seven days. If any of the child also reached the target for both OTP and TSFP program, actually it also increased the length of stay of children to be discharged exactly at the second visit." (NGO Practitioner, South Sudan)

However, anecdotal declines in program performance that interviewees associated with the reduced frequency of follow-up visits were not reported everywhere. Two interviewees reported that they did not

observe an increase in default, non-response rates, or lengths of stay, despite initial concerns. One interviewee proposed that the convenience of reduced follow-up visits for caregivers might, with appropriate follow-up, compensate for other barriers to accessing treatment, improving coverage.

Anticipated Duration

Most interviewees, all of whom were implementing reduced follow-up visits for the first time, anticipated returning to standard programming, largely due to concerns about program performance. Reported increases in ration sharing among household members, extended lengths of stay, and observed deterioration in both SAM and MAM patients all motivated reversion to standard scheduling once COVID-19 transmission abated. One staff working in a refugee camp also commented that transitory nature of the camp's population also warranted more frequent follow-up visits. At the time of interview, another interviewee reported that their organization had already reverted to standard visits for SAM children due to deterioration and the need for closer monitoring.

Relatedly, several interviewees emphasized the responsive intention of this adaptation, given its primary aim of reducing crowding at facilities to enable social distancing. In Myanmar, for example, the change was specified as an emergency measure only while COVID-19 transmission was a high risk in particular communities. The interviewee reported in September that their organization reverted to normal protocols in June when cases were low, but restarted the change during a spike in August. One interviewee confirmed that their organization returned to standard visits during regressions in COVID-19 cases, while another commented that they anticipated continuation of the reduced frequency of follow-up visits for the foreseeable future due to the high COVID-19 caseloads. These cases demonstrate the responsive nature of this adaptation and the organizations' intention to revert to standard protocols beyond the pandemic.

Respondents to the May 2021 follow-up survey echoed these findings: out of those implementing a reduced frequency of follow-up visits (six partners in 12 countries), two partners in three countries (Central African Republic, parts of Somalia, and Myanmar) reported reverting to standard follow-up visit schedules after four weeks, six months, and one year, respectively. Cited reasons included challenges related to defaulter tracing and improved IPC measures mitigating the need for adaptations. Respondents from CAR and Somalia both expressed concerns about children's improvement and program performance (e.g., lower weight gain, increased length of stay). However, one respondent indicated that reinstating less frequent follow-up visits would be considered if there were to be a surge in COVID cases that overwhelmed existing staff capacity.

Lessons Learned

Overall, this adaptation achieved its primary aim of reducing crowding and minimizing potential exposure to COVID-19 at facilities, according to interviewees. It also enabled continued service provision with reduced access to public transportation during lockdowns. One interviewee observed that this approach could be particularly useful in contexts with low rates of acute malnutrition and travel barriers.

"So I think in places like in Malawi where you have a low prevalence of acute malnutrition, but also where mothers have to travel longer distances, I would think it was a blessing in disguise to say maybe we need to reduce the frequency of their visits so that the caregivers can actually focus on other roles that they have at the household level, rather than frequently coming to the facilities. On this, as long as your outreach services are able to properly follow them up and ensure that, you know, they are actually feeding the child as per the guidelines." (NGO Practitioner, Malawi)

"One of the benefits is that the number of visits the household has to do is significantly decreased. So the flow of the patient to the health facilities was lesser because of this lockdown and other travel restrictions. Because in Nepal like public transportation still has not resumed completely in different parts of the country and even in some parts where it has resumed, it's still less. ... And so this has a huge implication on utilization of the health services. One of the advantages I would say, like this has reduced like travel time and also like maybe the decrease of exposure to the households to COVID-19 has also decreased. These are some advantages I see from that pragmatic perspective." (NGO Practitioner, Nepal)

Increased sharing of nutrition supplies amongst children was commonly reported across contexts. This was ascribed partially to increased ration distribution and increased need during the pandemic, particularly among food-insecure children who may not qualify for enrollment in an OTP or TSFP. Interviewees also reported increased nutrition supply sales. Most commonly, this occurred in contexts with high household need and constrained livelihood opportunities, particularly in refugee camps. Two interviewees running programs in a refugee camp anecdotally reported that households receiving both blanket supplementary feeding program (BSFP) rations and OTP/TSFP supplies may be more likely to sell nutrition supplies to meet other urgent needs. Strong mobilization and follow-up (e.g., by requiring that caregivers bring used sachets back to the facility) were employed to mitigate sales and sharing. One interviewee reported that they required caregivers with deteriorating children to return to facilities more frequently to ensure adherence. Another investigated families' situations (e.g., number of children, income, needs, etc.) to better understand why they would misuse the product and tailor follow-up visits or recommendations accordingly.

*"It is really difficult in the refugee situation. They have nothing to lock in or everything is open. What we have tried to advocate is ... they use some bags so they will hang it. So the children will not reach to that bag. ... And we have tried to advise to use a different technique, do the best with what they have. But still, it is really challenging because ... one child may be enrolled in the program and the other child is still waiting because they may not have enough food access. Sharing is very critical and difficult problem that still we are hosting in a refugee camp."
(NGO Practitioner, Ethiopia, refugee camp)*

As noted above, rapid deterioration between visits was a commonly noted concern. Interviewees emphasized that checking on sick or vulnerable children between the extended follow-up visits, either via home visits, phone calls, or referrals to on-call support, is a best practice to mitigate deterioration and catch complications early. Another practice was to provide caregivers with additional counselling on monitoring their children's progress during their facility visit (e.g., through Family MUAC and training on danger signs), and consistently emphasize the importance of adhering to dosage schedules and not sharing nutrition supplies among children in the household.

6. MODIFIED DOSAGE OF THERAPEUTIC FOODS

Under standard protocol, dosage of therapeutic food (e.g., RUTF) is calculated based on a child's weight and increases as a child gains weight in the program. Interviewees from Bangladesh, South Sudan, and Tanzania implemented different iterations of a modified dosage protocol. One interviewee in South Sudan shared that they used a universal dosage for all SAM children (e.g., two sachets of RUTF per day) based on previous research (12). Another in Bangladesh used weight-based calculations for already enrolled children using their last recorded weight and a universal dosage for new cases. Finally, a third organization in Tanzania calculated case-specific dosage according to the child's age, appetite, and progression.

Decision-making Factors

Across contexts, the primary driving factor for modifying children's dosage was the suspension of weight measurements at facilities to reduce contact and risk of COVID-19 transmission between facility staff and enrolled children. Interviewees commented that organizations needed to therefore calculate dosage differently. This also served to streamline dosage calculation, thereby reducing the time that caregivers and children spend at the sites. In one context where weight and height measurements continued, an interviewee highlighted this as the primary driver of the decision to change dosage.

Caregiver and Community Response

Under the modified dosage protocols, children often received less product than with standard protocols. One interviewee reported that caregivers were frustrated with the modified dosage and were concerned

that children were not receiving enough therapeutic food. However, they gradually accepted the adaptation once its drivers were explained. An interviewee representing a recent research study on modified dosage in Kenya commented that, in the context of their study, both caregivers receiving the regular and reduced dosage were dissatisfied with the amount. This indicates that this dissatisfaction may be unrelated to the adaptation itself; rather it reflects a desire for more food given dire household food insecurity conditions.

Operational Implications

Staff across multiple contexts reported that using a modified dosage protocol (e.g., a standard number of sachets per child per day) was quicker and easier, successfully reducing children and caregivers' time at facilities. This enabled staff to prepare rations ahead of time, rather than on a case-by-case basis, further streamlining children's time at the facility. Furthermore, interviewees also indicated that this simpler dosage enabled easier stock management, both in terms of maintaining stocks for longer due to the reduced rations distributed and simplifying supply forecasting.

"Even from the staff side, you know, previously they used to check the lookup table for RUTF because it is different from child to child. But currently they don't need to check, so they feel like it's really very quick. We know how many we are giving for each beneficiary." (NGO Practitioner, South Sudan)

"Because of the ration size reduction for RUTF, that really helps us to have like more stock than previously ... now every child is getting like two sachets per day. That really reduces the consumption of RUTF and that really helps us to have some stock still in our facilities." (NGO Practitioner, South Sudan)

Program Performance

Despite the improvements to supply management and distribution, interviewees warned of potential negative impacts on children's progress. One individual reported an anecdotal increase in length of stay that they attributed to modified dosage, though they also proposed other exacerbating factors. These included impacts from other simultaneous adaptations and increased sharing of reduced supply among children due to pandemic-related food insecurity. A further possible impact was an observed increase in relapse from TSFP back to OTP in one context.

Lessons Learned

Overall, interviewees reported that staff appreciated the adaptation as it enabled continued service provision despite suspended weight measurements. It also streamlined stock management and reduced children and caregivers' time at the facility. One interviewee also commented that the adaptation enabled treatment of more children given that they were using less product. However, they noted that both staff and caregivers consistently expressed concern that the reduced dosage would be insufficient for recovery. Due to these concerns and the intensive high-level political discussions necessary to modify dosage protocols in national- and global-level policies, one interviewee anticipated a return to regular weight-based dosage once the pandemic subsides. However, out of four follow-up survey respondents implementing a modified dosage, only one had already dosage reverted to standard dosage, indicating a continuation of this adaptation for the foreseeable future.

7. TREATMENT WHEN HEALTH FACILITIES ARE INACCESSIBLE

Given access challenges during the pandemic, organizations undertook several efforts to continue providing acute malnutrition services. Interviewees highlighted three main adaptations: providing treatment for MAM and SAM at household level through CHWs, CHVs, or community nutrition volunteers (CNVs) (Jordan, Myanmar); providing treatment at household level through regular staff during lockdowns (India, Myanmar,

Nepal, the Philippines); and conducting follow-up visits with enrolled children over the phone during lockdowns and facility closures (India). In addition to practitioners actively implementing adaptations during the pandemic, the research team also interviewed key informants who spoke on behalf of recent related research projects using these approaches to identify widely applicable lessons learned.

Decision-making Factors

Most interviewees cited movement restrictions and lockdowns as primary motivating factors. Some interviewees commented that they shifted to home-based service provision for uncomplicated cases due to caregivers' fears of visiting facilities. In some regions of India, facilities and community-based health centers closed; therefore, telephone-based counselling was the only way to continue service provision.

Rollout, Training, and Community Acceptance

Changes in where and how follow-up visits would take place were communicated via phone calls and communication trees. CHWs in Jordan were trained on their revised responsibilities via videos, WhatsApp messages, and phone calls. In the Philippines, staff contacted mother leaders about the shifts, who then communicated with their networks. One interviewee commented that some caregivers were afraid of home visits due to COVID-19; however, they eventually agreed due to scarce transportation options during lockdown. Interviewees overseeing research projects on CHW-led acute malnutrition treatment emphasized the need to engage local Ministries of Health, community leaders, and caregivers in rolling out home-based treatment, and to develop and use simplified tools to accommodate varied literacy levels.

During complete lockdowns in India, staff called caregivers directly. Here, an interviewee recalled that they distributed a month's ration to caregivers who brought their children to a facility before the lockdown started and followed up with phone calls. Staff also collaborated with doctors in nearby facilities to ensure a referral system for children reported to be ill or facing complications during the phone visit. Though this took some adjustment, the interviewee noted that caregivers were grateful for continued service provision despite the absolute lockdowns.

Staffing and Workload

Staff and volunteer workloads impacted decisions about who would lead (e.g., staff or CHW/Vs) home-based visits. In Nepal, an interviewee commented that CHWs faced increased demands on their time during the pandemic, including engaging in RCCE activities and adhering to IPC measures. Their capacity to scale up home-based treatment was therefore limited, and instead program staff conducted home visits and follow-up calls since their facility workload had reduced with less frequent follow-up visits. In two refugee camps in Jordan, CHVs were trained to treat MAM children at home since program staff could not travel to facilities as usual, limiting their capacity for in-person engagement. Interviewees implementing operational programs did not comment on CHW/V incentives; however, research supervisors emphasized the importance of incentives or stipends to compensate CHW/Vs for their efforts.

For phone visits in India, staff conducted counselling, while anganwadi workers, community-based health and nutrition workers, gathered phone numbers and visited children whose caregivers were unreachable. Given months-long facility closures, staff aimed to conduct two to three phone visits per enrolled child per week, increasing the number of engagements each child received. Interviewees here commented that staff's workload therefore increased relative to normal programming.

Across these adaptations, interviewees emphasized the need for clear communication and regular supervision when pursuing alternative treatment avenues. An interviewee in Jordan commented that CHW performance while providing home treatment lagged without regular supervision. A research project supervisor echoed this, highlighting the success of increased supervisory visits, though competing priorities and limited budgets hindered regular supervision visits.

Operational Implications

Transportation was a common logistical challenge for home visits. Interviewees attested to the difficulty of staff or volunteers carrying weighing scales, height boards, and therapeutic or supplementary foods to children's homes, particularly when also managing PPE and IPC measures. One interviewee commented that these challenges drove a temporary suspension of weight and height measurements. To reduce the supplies that CHWs needed to transport at once, they would allocate specific days to visit each sector and take only the rations needed for that area, with remaining rations stored at facilities.

For phone visits, the primary budgetary change was reduced facility-based costs and slightly increased phone costs and data plans. An interviewee explained that widely available, inexpensive unlimited calling plans enabled this approach. They also emphasized that phone visits were significantly less expensive than facility or home visits. However, the required time allocation increased, as staff spent 30-40 minutes on each phone call with enrolled children.

Program Performance

Interviewees across contexts largely did not comment on how home and phone visits may have impacted caseloads or program performance. Their responses emphasized the priority of continuing service provision at all in a challenging situation. One estimate of the impacted caseload for home visits came from Nepal: an interviewee estimated that about 10% of enrolled children required home visits due to movement restrictions. Furthermore, at the time of interview, an interviewee in India noted that it was not possible for them to tangibly monitor all children's progress as few caregivers were trained on MUAC measurements and even their measurements could not be verified. Also, no facilities or hospitals were taking routine weight measurements. Staff were therefore concerned about deterioration, since caregivers were not always trained to identify acute malnutrition complication danger signs. Staff were also unable to reach all enrolled children and could not enroll new children during the lockdowns.

Anticipated Duration

Across the three mechanisms of providing services when facilities were inaccessible most interviewees perceived these adaptations as responsive to COVID-19 circumstances. In Nepal, for example, an interviewee assessed that their organization would continue home visits as long as lockdowns and movement restrictions were in place. Similarly, interviewees conducting phone visits in India affirmed that these were a stopgap measure, and they would resume regular visits once facilities were reopened. Though these mechanisms met their achieved aims of continuing services, interviewees believed that they would revert to standard visits when possible.

Lessons Learned

Overall, home visits conducted by either staff or CHW/Vs enabled continued service provision during lockdowns and movement restrictions. One interviewee noted that home visits allowed for more personalized services than busy, crowded facilities. However, with CNV-led treatment in a refugee camp in Jordan, there were concerns that children, especially with medical challenges or complications, were not seen by more highly trained health workers or staff: perceptions that CNVs were uneducated or unqualified drove some pushback from caregivers who reportedly preferred more professional services.

Regarding phone visits in India, an interviewee commented that the pandemic drove this innovation, which had not been tried before. They affirmed that it enabled consistent, often more frequent interaction, regardless of travel capacity. A noted best practice was to ensure advocacy to government officials and local hospitals to ensure smooth referrals, which served the dual purpose of promoting uptake by other organizations as well.

This particular pandemic actually opened opportunities. We started working on things which we never thought of, like we never thought of having telephone counseling. So when this idea was brought to my team, my team really asked me how it can be done. ... I can understand the discomfort, what the team was having. And I was also not very comfortable because although I know that the idea was floated but how we are going to do it, what kind of struggle we will have, because most of the time the phone is with the husband and most of the time the mother will say, oh don't speak to me right now because I have work to do. But taking that risk actually helped as I can say." (NGO Practitioner, India)

The phone-based approach faced some challenges. An interviewee commented that reaching all enrolled children via phone was a challenge: not all caregivers had phones, some had changed phone numbers since enrolling their children, and others lived in rural areas with limited service. It was also sometimes difficult to speak to the female caregiver, who usually took responsibility for the phone visit, as men typically had the phone and there were several competing household responsibilities. This was addressed by asking community-based workers to visit the children's homes where possible. Furthermore, an interviewee stressed that face-to-face visits were more effective than phone visits alone to verify children's status and progress. Certain conditions could not be treated over the phone, and it was sometimes challenging to identify whether a child was deteriorating. The interviewee said their organization addressed this by strengthening relationships and referral systems to provide emergency care if needed.

"I feel that telephone counseling is OK when it's an emergency, because continuing with telephone counseling really is an energy draining process for both the beneficiary as well as the counselor because they are on the call for 30, 40 minutes. And when you say home visit, you physically look into the health of the child, you understand what the child is going through or know if they will say that the SAM child is not talking or playing, you are actually looking at that child. Meeting a person face to face gives much more impact rather than being on telephone." (NGO Practitioner, India)

DISCUSSION

These findings illustrate the complex adjustments organizations and governments undertook to continue providing life-saving services during the COVID-19 pandemic. The most common adaptations (e.g., Family MUAC and a reduced frequency of follow-up visits) were aimed at addressing two critical challenges: (1) movement restrictions and lockdowns, and (2) mitigating COVID-19 transmission risk. Family MUAC was perceived as a low-cost, low-risk investment with potential for high return in the form of increased caregiver knowledge on how to monitor and act on their children's nutrition status. Reducing the frequency of follow-up visits minimized crowds at facilities and eased demands on caregivers to travel during difficult times.

Though this report discussed each adaptation in isolation, many organizations and governments implemented adaptations in tandem to address multiple objectives or compensate for anticipated challenges brought by a particular adaptation. For example, those who suspended weight and height measurements tended to also modify the dosage of therapeutic food children received, since it could no longer be calculated by weight. This was paired with Family MUAC training to increase community-based and caregiver-led screening for the remaining admission criteria. Suspended WHZ was also sometimes paired with an expanded MUAC threshold for admission to capture more children. Another common combination was a reduced frequency of follow-up visits implemented alongside Family MUAC and home or phone visits. These latter adaptations could increase caregiver capacity to monitor their children's progress and seek help if needed. However, these combinations varied between contexts according to need. These examples demonstrate how protocol modifications can be selected and combined to achieve objectives based on context-specific considerations.

While adaptations can be highly synergistic, these findings also illuminated some tensions. For example, some organizations scaled up Family MUAC while revising MUAC admission thresholds upwards. However, the standard color-coded tapes that caregivers use did not reflect the revised thresholds. Children eligible for admission under the adaptation may therefore not have been identified through Family MUAC. Another possible tension was between a reduced frequency of follow-up visits and modified dosage. Positively, a modified dosage comparatively lightened the larger load a caregiver had to transport and store between less frequent visits. However, in cases where dosage was reduced, this could exacerbate the impact on a child's recovery from any challenges caregivers faced from the less frequent visits. Such challenges include storage, dosage regimen adherence to ensure supplies lasted between visits, or sale or sharing of the ration due to increased food insecurity and economic vulnerability.

A common best practice was to ensure adaptation buy-in among multiple stakeholders at all levels: national, regional, and local governments; Nutrition Clusters and other coordinating bodies and technical working groups; facility and community-level staff and volunteers within the organization; local and community leaders; and, of course, caregivers. Another best practice was to roll out adaptations through multiple sources (e.g., facilities, care groups, house-to-house visits, phone calls and SMS, etc.). This maximized information transmission and uptake through diverse mechanisms and repeated exposure to messaging. Finally, access to flexible funding sources and strong partnerships enabled innovation and adaptability. Future programs using adapted protocols can draw from these best practices to enhance impact.

In addition to these successes, there were several common challenges across contexts. Interviewees widely reported a reduction in health-seeking behaviors during the pandemic, largely for fear of contracting COVID-19 at facilities and travel hindrances. This observation was certainly not unique to these contexts, with high-income countries also reporting similar behavior (13). Movement restrictions and the need to reduce gathering sizes to enable social distancing hindered adaptation rollout and regular and refresher trainings for staff, community-based workers, and caregivers. Across adaptations, interviewees identified a lack of strong monitoring systems and adaptation-specific indicators (beyond routine program data) to identify successes and challenges. Widely reported increases in household-level engagement with communities to monitor dosage adherence and children's progress, minimize default, and continue case detection and referral may have increased risks of viral transmission between staff, households, and

communities if PPE was unavailable or unused and IPC measures were not followed. To address these challenges moving forward, program design should increase sensitization on the importance of early identification and treatment of acute malnutrition as well as assuaging caregiver concerns about viral transmission; and capitalize on opportunities for virtual trainings to reduce associated costs and increase access. The global nutrition community must also collectively develop tools and indicators specific to each adaptation to capture impacts and compare effects across contexts.

Finally, interviewees widely expressed uncertainty or concerns about the performance and outcomes of these adaptations. Some concerns stand in contrast to existing evidence on protocol modifications. For example, interviewees implementing Family MUAC reported a range of caregiver measurement accuracy, from as low as 30%. However, multiple research studies on Family MUAC have found non-inferiority between caregivers' and CHWs' measurements (14–16). One interviewee implementing MUAC- and edema-only programming was concerned that MUAC measurements would not detect deterioration as well as weight measurements, despite evidence showing that MUAC and weight gain are positively correlated (17). While randomized controlled trials on modified or reduced dosage of therapeutic foods show non-inferior recovery rates (12,18,19), several interviewees worried that a reduced dosage would increase length of stay and reduce recovery.

These disparities may have multiple causes. They could demonstrate the difference between implementation in a rapidly scaled operational setting versus a highly controlled and well-monitored research setting. Several external factors related to COVID-19 may have also influenced program performance and caseloads, such as economic and food insecurity, travel restrictions, and fear of COVID-19 hindering health-seeking behaviors. Finally, given that the concerns on caseloads and performance were largely anecdotal or based on observations of a few months' data, it is possible that these concerns would be assuaged by more intensive analysis of program data over a longer period. Further research and operational data analysis are needed to examine and isolate the adaptations' true impact.

FAMILY MUAC

Family MUAC was implemented in numerous contexts pre-pandemic. However, rollout and scale-up was often accelerated due to COVID-19 challenges: reduced or suspended community screening activities and the need to maintain distance between caregivers/children and healthcare workers to prevent infection. Overall, the intervention was widely accepted by health care workers, caregivers, and the community, a finding observed in previous evaluations and assessments of the Family MUAC approach (14). As numerous interviewees indicated, Family MUAC could support and supplement CHW/Vs' community screening and surveillance activities; however, implementers must ensure that all stakeholders know the specific responsibilities and expectations of everyone involved. Despite the possibility of initial resistance – from caregivers expecting the responsibility of diagnosis to rest with health workers, to volunteers not wanting to cede one of their responsibilities – proper sensitization and training at the beginning of the intervention can address these concerns.

In general, the Family MUAC approach does not require complex logistical interventions for successful implementation. However, the approach still relies on sufficient, readily accessible supplies (e.g., MUAC tapes) for caregiver distribution. Implementers should also secure buffer stocks in case of increased demand or regular wear and tear. Additionally, the modality and frequency of trainings should be carefully considered, including ideal group size and how information is cascaded (i.e., through care groups or peer support groups, CHW household visits, or large group trainings), with supervision and follow up afterward.

Practitioners noted several operational considerations and challenges. Many interviewees noted that caregiver measurement accuracy varied significantly in practice, though prior studies have documented high caregiver accuracy (15,16). Further investigations should explore this gap between published evidence and anecdotal challenges. Interviewees also noted the importance of preparation (in terms of available human

and financial resources and commodities) to accommodate increased referrals and admissions resulting from more self-referrals by caregivers trained in Family MUAC.

Finally, interviewees noted several ethical considerations for organizations implementing the Family MUAC approach. If the approach works as planned (e.g., caregivers taking correct measurements and seeking treatment promptly) health facilities and implementing organizations could see caseloads increase, particularly of MAM cases as caregivers identify acute malnutrition earlier in its progression. This may ultimately be a preventive measure for SAM. However, if there are inadequate MAM treatment services where Family MUAC is implemented, NGOs risk creating demand for services that may not exist or are inaccessible. Practitioners should ensure that appropriate services are in place, or that adequate referral mechanisms exist so that caregivers can access the necessary care for their child.

Key lessons and recommendations:

- Train caregivers how to check for edema and other acute malnutrition danger signs in addition to measuring MUAC and integrate sensitization on causes and prevention of malnutrition.
- Plan for and procure sufficient MUAC tapes for wide distribution to maximize coverage.
- Clearly delineate roles of community volunteers, clinic staff, and caregivers in screening and referrals to streamline processes, maximize collaboration, and assuage tensions.
- Prepare clinics for elevated caseloads that may result from an initial increase in self-referrals.
- Retrain caregivers that self-refer children with inaccurate measurements and encourage them to continue health-seeking behaviors.
- Expand availability and coverage of MAM treatment services where Family MUAC is implemented.
- Develop standard monitoring and evaluation tools and indicators for use across contexts.
- When possible, Family MUAC should complement, rather than replace, traditional community-based screenings and surveillance coverage.

MODIFIED ADMISSION AND DISCHARGE CRITERIA

Suspending WHZ as an admission criterion was introduced to reduce contact and therefore the risk of COVID-19 transmission between staff, children, and caregivers during the pandemic. The conversations that interviewees relayed around whether to proceed with this adaptation reflected larger patterns and themes found in ongoing debates on this topic. Several studies and analyses have demonstrated that WHZ and MUAC identify largely distinct groups of children as malnourished, with the degree of distinction varying according to the context (9,10,20). Indeed, many interviewees were concerned that suspending WHZ would leave nutritionally vulnerable children without access to treatment. Increasing the MUAC admission threshold attempted to compensate for this gap. However, interviewees' feedback echoes other studies findings that increased MUAC thresholds do increase admissions and caseloads but do not necessarily capture all children who would have otherwise been admitted based on low WHZ (17,21). These findings underscore the need for protocols to clearly define which groups of children they are targeting (e.g., those at highest risk of mortality or deterioration, all undernourished children by any metric, etc.) and select the admission criteria that most closely identify those groups of children for admission.

Operationally, interviewees observed that increasing MUAC thresholds notably impacted caseloads and demand for supplies and resources. Analyses on which thresholds to select therefore must seek to optimize inclusion of prioritized groups while accounting for the realities of supply and budget constraints in the context of an abrupt protocol change. Furthermore, implementing increased admission thresholds may cause confusion within community-based screening activities if staff and caregivers are not also trained on and equipped with the tools to also implement the revisions. Developing MUAC tapes that reflect the new thresholds may reduce confusion, though interim steps are necessary as this requires an extensive process.

Key lessons and recommendations:

- In the context of suspended WHZ, conduct assessments to determine which revised MUAC thresholds would optimize identification of at-risk children for admission alongside available program resources and capacity.
- Increase staff and community sensitization when expanding admission thresholds to ensure proper care of children who meet the new requirements both at the clinic and home.
- Strengthen supply chains to meet increased needs for nutrition products (e.g., RUTF, RUSF, etc.) to cover potential caseload growth due to expanded thresholds.
- Develop guidance for organizations implementing both expanded thresholds and Family MUAC to align MUAC cut-offs and referral processes.

REDUCED FREQUENCY OF FOLLOW-UP VISITS

Reducing frequency of follow-up visits successfully reduced crowding at facilities, enabling social distancing and alleviating caregivers' need to travel. Operationally, the adaptation had varied impacts on staff workload. Staff implementing this change alongside other adaptations to streamline services experienced reduced facility-based workloads. This may offer the opportunity to dedicate more time to community-based work, with appropriate PPE, such as increased mobilization, absentee tracing, or check-ins to support caregivers in adhering to dosing regimens. Conversely, if the adaptation is implemented such that facility opening days and hours are extended, it may place additional demands on staff's workloads and constrict their capacity to engage in other activities. Either outcome could influence staffing needs and budgets: increased community-based work would require additional transportation to facilitate these activities, while lengthened working days could warrant an increase in staffing or remuneration.

Regarding logistics and costs, rapid rollout at the start of the pandemic left several organizations scrambling to meet the sudden increase in demand to distribute larger rations at each less frequent visit, with stocks quickly depleted. Prepositioning supplies with more advance notice and flexible and adaptive supply chains would enable a smoother rollout. Beyond this initial demand, supply chain impacts under this model compared to those for standard visits are limited, given that the total amount of product (e.g., RUTF, RUSF, FBF) used per child did not seem to change. However, the adaptation may impact supply chain management and product demand if it impacts program outcomes. For example, if interviewees' concerns about an increased length of stay in the program or deterioration manifested, additional supplies and product would be necessary to accommodate the longer time in the program.

Key lessons and recommendations:

- Provide strong community sensitization to reduce confusion amongst caregivers and increase uptake of and adherence to new schedules.
- Train caregivers how to monitor MUAC, edema, and acute malnutrition danger signs (e.g., through Family MUAC) to enable monitoring and early identification of deterioration between visits.
- Increase counselling at facilities and home visits to ensure robust caregiver support in dosing larger rations between appointments.
- Recommend more frequent appointments for sicker or more vulnerable children during treatment.
- Strengthen supply chains to support supply prepositioning to meet increased need for nutrition products for the extended period between visits.
- Explore storage alternatives for families unable to safely manage the larger ration sizes that accompany less frequent clinic visits.
- Develop context-specific interventions to address sharing and selling of nutrition products, including an assessment of the reasons for sharing and selling (e.g., economic or food needs, lack of awareness, etc.).

MODIFIED DOSAGE OF THERAPEUTIC FOODS

Overall, modifying and simplifying the dosage regimen was widely lauded for its impact on streamlining processes and reducing caregivers' and children's time at facilities, while also improving caregivers' understanding of the dosage calculation. Notably, rations prepared ahead of time made service provision more efficient. Training staff how to calculate a simplified dosage (e.g., two sachets per child per day) is inherently more straightforward than training for a look-up table. Finally, a reduced dosage enables treatment of more children with less product. However, as with reduced follow-up visits, the impact of modifying dosage on stock management is contingent on children's outcomes: if children deteriorate, increase time to recovery, or relapse under a modified dosage, initial cost and product savings would be reduced, in addition to impacting child's health. Several studies have shown that recovery rates with varied modified or reduced dosages are non-inferior to those under standard dosage protocols (12,18,19), but additional research is needed to understand the full impact on programmatic outcomes, growth, and costs.

Key lessons and recommendations:

- Ensure that caregivers are consulted throughout implementation of the approach, with clear explanations given to justify the change in protocol.
- Closely monitor children's progress at and between facility visits, particularly for larger or more vulnerable children, to ensure adequate weight or MUAC gain and identify deterioration early.
- Engage with caregivers to support appropriate dosing and minimize sale and sharing of nutrition products, especially when combining modified dosage with extended time between follow-up visits.

TREATMENT WHEN FACILITIES ARE INACCESSIBLE

Out of all adaptations, efforts to continue service provision when facilities were inaccessible were the most context-specific and varied. According to interviewees, each organization responded to accessibility issues according to their staff's capacity and available options. Those with well-trained CHW/Vs could capitalize on their capacity to provide home-based treatment, while facility staff were tapped in contexts with limited or otherwise engaged CHW/Vs. In India, prevalent phone usage and access to inexpensive data plans facilitated phone counselling when face-to-face visits were impossible. These adaptations demonstrated organizations' resourcefulness and the diverse options available in emergency contexts where facility access and coverage are primary challenges.

Shifting to home-based visits impacts staffing requirements and workloads as this approach is significantly more time- and travel-intensive than facility visits, especially in rural locations or areas with widely dispersed populations or challenging terrain. Therefore, this approach would be maximized either in contexts with low caseloads or with increased staff and/or CHW/Vs. As seen from this project and other research studies on CHW-led treatment, the logistics of last-mile service delivery remain challenging (22,23). Transporting and storing supplies and nutrition products presents logistical and sometimes security challenges, regardless of whether it is staff or CHW/Vs providing treatment. Extra attention must be given to strengthening this component when shifting to home visits.

Key lessons and recommendations:

- Where possible, integrate a video or photo component to telehealth visits to enable a visual assessment of a child's anthropometry.
- Ensure staff and volunteer safety while transporting supplies to children's homes. Coordinate with district health office and other local authorities to strengthen last mile stock management.

CONCLUSION

The COVID-19 pandemic provided an opportunity for a paradigm shift in humanitarian work more broadly and CMAM programming more specifically. Widespread interruptions and challenges to service provision illuminated the precariousness of standard ways of working. Yet, organizations and governments responded to these challenges with innovation and flexibility. Piloting and scaling up protocol adaptations addressed immediate needs of continued service provision and reduced transmission risks. However, they also elicited more questions about which components of traditional CMAM programming are critical and which can be adapted and strengthened, both during the pandemic and beyond.

The pandemic underscored the need for stronger caregiver and community ownership over screening for and treatment of acute malnutrition. With prevalent movement restrictions and limited transportation during the pandemic driving suspended community screenings and less frequent follow-up visits, the responsibility for identifying acute malnutrition and administering treatment shifted largely onto caregivers' shoulders. The need to equip them with the necessary tools, information, and training to take on this responsibility featured across contexts. Future research and programs should center and emphasize such actions.

Operationally, several adaptations (e.g., MUAC- and edema-only admission criteria, reduced dosage) were widely reported to simplify and streamline program logistics and implementation. This could have positive implications for both coverage and resource management. At the same time, there were several concerns around impacts on children's progress and outcomes. Most interviewees reported that, despite the strengths of some adaptations, they anticipated reverting to standard protocols once COVID-19 transmission risks were mitigated due to these concerns. Rigorous and comparable data on outcome impacts is limited, highlighted the need for more research and evidence on these adaptations in varied contexts. Though initial analyses of programmatic data during the early stages of the pandemic indicate minimal impact (24), additional multi-year programmatic data and rigorous research using a control group are both critical to optimize the finer points of each adaptation and build confidence among implementing staff.

Due to the need for immediate, emergency action to mitigate the viral spread, protocol adaptations were able to be rolled out and scaled up much faster than ever seen before. In non-emergency times, protocols are included within Ministry of Health policies, which must undergo a much more extensive review and consultation to make official changes. More evidence and advocacy on adaptations are necessary to support and inform these review and consultation processes, should Ministries intend to codify these adaptations long-term. As the global community transitions to a "new normal," the time is ripe for such efforts to reexamine standards and protocols, and identify the optimal way forward to save more lives.

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ANNEX A: SCREENING SURVEY

Platform: Survey Monkey

Note: Text in brackets [text] will not be seen by respondents but describe skipping patterns of the survey.

Step 1: Privacy and Data Use Statement

Participation in this survey is voluntary. The information you provide will be used for the purposes identified above. Any personal contact information provided will be used solely for follow-up by Action Against Hunger to verify content provided in this survey and inquire about potential further participation in the study. By checking the box below, you agree to the conditions outlined in [Action Against Hunger's Privacy and Data Use Plan](#) and [Action Against Hunger's State of Acute Malnutrition Website Privacy Policy](#).

If you have a concern about any aspect of this study please contact the PI, Heather Stobaugh, at hstobaugh@actionagainsthunger.org or the Solutions IRB at (855) 226-4472 or participants@solutionsirb.com.

Please review the documents and check a box before continuing.

- Yes, I agree.
- No, I do not agree and understand that I will not be included in Action Against Hunger's study.

[if no, the following will appear]

Declined Consent

Thank you for your time. Because you have declined consent regarding the privacy and data use plan, no further action is requested. No program data or personal contact information has been collected nor will be used as part of this study.

[if yes, the survey will begin with the following form to be completed]

Step 2: Data Collection

About the Respondent

1. Name: _____
2. Email: _____
3. Skype ID: _____
4. Job Title: _____
5. Name of Organization: _____
6. Type of Organization:
 - Academic/Research Institution
 - Consultant
 - NGO - International

- NGO – National, Local or Regional
- Government
- Other: _____

7. In which country are you based: _____

Step 3: About the Organization’s Acute Malnutrition Programming

8. Either prior to or as a result of the COVID-19 pandemic, has your organization chosen to implement adaptations to CMAM or other outpatient/community-based programs for the treatment of wasting in children under five? (For the purposes of this survey, an adapted approach refers to variations from otherwise standard global and/or national protocols. Examples include simplified approaches, combined protocols, Family MUAC, modified or reduced dosage of foods, modified follow-up appointment schedules, MUAC-only programming, SAM treatment by community health workers, etc.)

- Yes
- No [if checked, skip to 19]

9. [if yes to 8] What adaptations have been implemented? *(please select all that apply)*

- Modified frequency of follow-up appointments during treatment of acute malnutrition
- Modified or reduced dosage of therapeutic and/or supplementary foods during treatment of acute malnutrition
- Combined SAM and MAM treatment in one protocol within a CMAM program (i.e. using same admission/discharge criteria in one program)
- Use of one product (e.g. RUTF) for the treatment of both SAM and MAM
- Modified admission, and/or discharge criteria during treatment of acute malnutrition
[if checked, then answer the following]
 - Use of MUAC, [if MUAC checked then answer the following]
Admission cut-off: _____, Discharge cut-off: _____, Measured by caregiver? Yes No
 - Use of WHZ, [if WHZ checked then answer the following]
Admission cut-off: _____, Discharge cut-off: _____
- Family MUAC (defined as caregivers trained to monitor their children’s MUACs at home through)
- SAM treatment by community health workers (e.g. iCCM+Nut, iCCM+SAM)
- Use of [low-literacy tools](#) used by community health workers during treatment of acute malnutrition
- Other modifications *(specification will be asked in the following questions)*

[If yes to 8. For each of the boxes checked in question 9, a series of follow-up questions will be asked. The following is an example using text for if a respondent checks the box next to “Modified frequency of appointments during treatment of acute malnutrition”.]

10. [if checked multiple boxes to 9] Do the implementation details (i.e. timeline, programs applied to, countries implemented in, etc.) of “Modified frequency of appointments during treatment of acute malnutrition” apply to all additional types of adaptations?

- Yes [If checked, skip to 19]
- No [If no, then questions 11-18 will be repeated for each type of modification checked in question #9]

11. Please elaborate on “Modified frequency of appointments during treatment of acute malnutrition”

12. What cases are managed by “Modified frequency of appointments during treatment of acute malnutrition”? *(please select all that apply)*

- SAM cases
- MAM cases
- Infants < 6 months
- Children 6-23 months
- Children 24-35 months
- Children 36-59 months

13. To what types of programs are “Modified frequency of appointments during treatment of acute malnutrition” applied? *(please select all that apply)*

- Supplementary feeding programs
- Outpatient therapeutic programs
- Stabilization centers/inpatient facilities
- Integrated community case management (iCCM)
- Other, please specify: _____

14. Where is “Modified frequency of appointments during treatment of acute malnutrition” implemented?

Country _____ Region _____ Context:
 Town/Village
 Rural
 IDP Camp
 Refugee Settlement
 Other

If implemented in multiple locations, please click to add additional country

Country _____ Region _____ Context:
 Town/Village
 Rural
 IDP Camp
 Refugee Settlement
 Other

15. When did implementation of “Modified frequency of appointments during treatment of acute malnutrition” begin?

- Has begun, Month: _____ Year: _____
- Has not yet begun, but set to begin in Month: _____ Year: _____ [if checked, skip to 17]

Has not yet begun, still in consideration phase only [if checked, skip to 19]

16. Is “Modified frequency of appointments during treatment of acute malnutrition” still ongoing?

- Yes
- No [if checked, skip to 18]

17. For how long do you anticipate “Modified frequency of appointments during treatment of acute malnutrition” to continue?

- Less than 3 months
- 3 - 5 months
- 6 - 11 months
- 1 - 2 years
- Longer than 2 years
- Unknown/unspecified/TBD
- Other: _____

18. Are you willing to be contacted for potential participation in a short interview by Action Against Hunger researchers regarding further details of the content of your responses?

- Yes
- No

19. Are you willing for Action Against Hunger to share results from this survey (excluding personal information) on the [State of Acute Malnutrition website](#)?

- Yes
- No

20. Would your organization consider sharing routine monitoring data (e.g., monthly admissions, recovery rates) with Action Against Hunger and the CDC to be included in a potential secondary analysis related to adapted CMAM programs? (Please see Request for Data for more details.)

- Yes
- No

21. [if checked Yes to 8] Are you willing to share a copy of your organization’s modified protocol?

- Yes
- No [if checked, skip to end of survey]

22. Please upload a copy of your organization’s modified protocol

- Upload protocol here
- Will provide protocol at a later date

End Survey

Thank you for taking the time to complete this survey. We value the information you have provided. Your responses will contribute to understanding the implications of CMAM adaptations for the treatment of child wasting. If you have any comments on the survey or would like to provide additional information, please contact: cmamadaptations@actionagainsthunger.org

ANNEX B: LIST AND DEFINITIONS OF PROGRAM ADAPTATIONS

Adaptation	Definition
Family MUAC (sometimes referred to as Mother MUAC)	Caregivers are trained to monitor their children's MUAC at home and to refer them to a community health worker (CHW) or facility when they detect signs of acute malnutrition.
Reduced frequency of follow-up visits	Adjusting the timing for when children who are enrolled on an outpatient program (OTP) or Targeted Supplementary Feeding Program (TSFP) return to the facility for follow-up consultations and ration distribution. For example, children enrolled on an OTP may come to a facility every other week instead of weekly.
Modified admission and/or discharge criteria	The most common anthropometric measurements used for determining eligibility for admission into a nutrition program are weight-for-height (WFH), mid-upper arm circumference (MUAC) and oedema. This adaptation could include a shift to using only one or two of these criteria or adjusting the thresholds for admission.
Modified dosage of therapeutic and/or supplementary foods	Change in the amount of ready-to-use therapeutic food (RUTF) or supplementary food (RUSF) prescribed for children's consumption on a daily or weekly basis. For example, facility staff may use non-standard methods to calculate RUTF/RUSF dosage or may reduce the dosage of RUTF/RUSF for each child.
SAM Treatment by CHWs	Initiatives such as integrated community case management (iCCM)+Nut where children presenting with SAM are diagnosed and treated through a community-based platform that does not include a facility component.
Use of low-literacy tools by CHWs	Low-literacy tools are developed to facilitate the work of CHWs treating SAM who may have low literacy or numeracy skills.
Use of one product for the treatment of SAM and MAM	Traditionally, two separate products are used to treat SAM and MAM at the community level: RUTF is most commonly used to treat SAM while RUSF or improved corn soy blend (CSB++) is used to treat MAM. This adaptation refers to a shift in which a single product is used for the treatment of both SAM and MAM.
Combined SAM and MAM treatment	Development of acute malnutrition protocols that manage and treat cases of SAM and MAM on a spectrum, whereby both SAM and MAM cases are managed utilizing one admission/discharge criteria, one therapeutic product, etc.

For more information on these approaches, see:

Action Against Hunger USA (2021). State of the Evidence 2021: Modifications Aiming to Optimize Acute Malnutrition Treatment in Children Under Five. New York, NY. <https://www.actionagainsthunger.org/publication/2021/08/state-evidence-2021-modifications-aiming-optimize-acute-malnutrition-management>

ANNEX C: SEMI-STRUCTURED INTERVIEW GUIDE

Semi-Structured Interview Guide - Adaptations

File/Interview ID: _____
(Date.Organization.Country.#)
Interviewer: _____
Note Taker: _____
Date of Interview: _____
Modality of Interview: _____
Interviewee Name: _____
Interviewee Organization: _____
Interviewee Position: _____
Interviewee Contact Email/Skype: _____
Participant ID #: _____
Consent to record interview: _____

Thank you for taking the time to participate in today's interview. We understand that because of COVID a number of changes have been made to protect staff, caregivers and children such as the use of PPE and increased IPC measures. While those are important, for today's interview, we would like to focus primarily on the adaptations/modifications that have been made to the protocols used for the treatment of wasting (i.e. CMAM protocols), the decision making process around which modifications were made, the logistic pieces that have been put into place as part of the implementation of the adaptations, and the effects seen because of the adaptations both on programmatic outcomes as well as on operations.

Section 1 – Details of the Adaptations

First, I'd like to ask about the adaptations that your organization is implementing...

1. Tell me about how your current programs addressing the management and treatment of acute malnutrition have been adapted / modified / changed as a response to the COVID-19 pandemic. (Probe for any further details not captured in the survey; verifying initial content and expanding on information from screening survey)
2. How widespread are these adaptations within your organization? (Probe for scale and scope of adaptations, i.e. local vs national vs regional implementation)

Section 2 - Decision Making & Collaboration Processes

Next, I'd like to ask you about the decision-making behind the implementation of these adaptations...

1. What led the organization to make these adaptations? (Probe for both COVID-specific responses and any other pre-existing factors. i.e. timeline, decision making process; if NGO how was government involved, approvals or non-approvals)
2. Of the COVID-19 programming guidance documents issued by nutrition coordinating mechanisms (UNICEF, GTAM, MoH, National Nutrition Clusters, etc.), did your organization chose not to implement any of the outlined recommendations?
 - a. Which recommendations were chosen not to be implemented?
 - b. What led the organization to decide not to implement these adaptations?

3. How have you worked with existing local authorities (e.g. MoH, government clinic staff, donors, etc.) to implement these adaptations? Probe for:
 - a. Support/opposition and how opinion shifted
 - b. Innovative collaboration mechanisms
 - c. Any tools / tips to be shared on techniques to improve collaboration

Section 3 – Facilitators and Barriers

Next, I'd like to ask about facilitators and barriers to the implementation of these adaptations...

1. What has been successful with regards to implementing the adaptation? Why? Probe for:
 - a. Staffing
 - b. Training
 - c. Workload
 - d. Caseload
 - e. Logistics
 - f. Community acceptability
2. What has been challenging with regards to implementing the adaptations? Why? Probe for:
 - a. Staffing
 - b. Training
 - c. Workload
 - d. Caseload
 - e. Logistics
 - f. Community acceptability

Section 4 – Operational Considerations of Adaptations

Next, I'd like to discuss some other specific operational considerations...

1. How are these adaptations being implemented with program and clinic staff? (Probe for communication and training strategies, staff reception, etc.)
2. How are you monitoring the implementation of these adaptations? (Probe for remote supervision techniques, quality assurance checks, etc.)
3. How are these adaptations being communicated to the community? How are the adaptations being received by the community? (Probe for communication and sensitization strategies, community reception, etc.)
4. Have there been any changes to existing logistics processes or supply chain management that have occurred due to this adaptation? Can you describe them? Probe for:
 - a. How easy have they been to implement
 - b. Have there been any innovative solutions to encountered challenges
 - c. Have there been any cost or staff training implications

Section 5 – Contextual Factors around Adaptations

1. Are there any unique factors specific to your organizations' context (e.g. organizational priorities, national guidance or policy, existing staff and capacity) that has influenced the successful implementation of this adaptation?

Section 6 - Potential Lessons to Learn

Lastly, I'd like to ask about potential lessons learned and the future of these specific adaptations. What do you see as lessons learned from implementing the adaptations with regards to future programming?

1. From your observations, what effects have the adaptations had on the management and treatment of acute malnutrition?
2. How can we effectively collect data (or what types of data would we need) on these adaptations that are rigorous enough to generate convincing evidence either for or against these adaptations?
3. Are there any strategies, techniques or tools that have been applied to help overcome barriers experienced?
4. Are there any particularly successful strategies or tools that should be replicated or piloted in different contexts?

Section 7 - Anticipated Sustainability/Other Considerations

1. Do you anticipate any of the adaptations the organization has made to its program will become routine programming?
 - a. Which adaptations do you anticipate will become permanent features of acute malnutrition programming?
2. Are other organizations in your same context implementing adapted approaches? Who would you recommend we speak with? (Probe for both organizations that are and are not implementing adapted approaches)