Analysis of Child Undernutrition Intervention Priorities Among Nutrition Stakeholders from Multiple Low and Middle-Income Countries

Sophia Wang

A thesis

Submitted in partial fulfillment of the

Requirements for the degree of

Master of Public Health

University of Washington

2018

Committee:

Scott Ickes

Adam Drewnowski

Program Authorized to Offer Degree:

Nutritional Science

University of Washington

Abstract

Analysis of Child Undernutrition Intervention Priorities Among Nutrition Stakeholders from Multiple Low and Middle-Income Countries

Sophia Wang

Chair of Supervisory Committee:

Scott Ickes, Affiliate Assistant Professor

Health Services

Background: World Health Assembly 2025 targets call for reducing and maintaining the global prevalence of wasting (weight-for-height z score [WHZ] < - 2 SD) among children under five to below 5%. However, currently interventions that prevent wasting are characterized into two "camps" of preventing stunting and preventing severe wasting through treating moderate acute malnutrition (MAM); this makes estimating pooled effectiveness on wasting difficult. There is clear overlap and there needs to be a better understanding how program makers and policy makers understand these interventions.

Methods: 2 separate questionnaires were developed (one for national organization and one for multi-national organizations). These questionnaires were used during the 23 key informant

interviews that were conducted over Skype. The interviews were transcribed and then coded through Dedoose; the codes were then categorized into families. Then the excepts for the codes were analyzed. Additionally, the nutrition strategy for 12 different organizations (national and multi-national) were analyzed to understand the current interventions of various organizations.

Results: The 15 original codes were grouped into 5 families.

Family 1: Intervention types and categorization (nutrition supplementation, nutrition education, intervention types and categories). There are various interventions cited by the respondents and they mainly are types of supplementation or education to both mothers and infants.

Family 2: Treatment of moderate acute malnutrition and prevention of wasting (wasting and acute, importance of MAM, moderate severe, wasting prevention examples, wasting prevention types). Wasting and acute malnutrition are interchangeable words and while malnutrition prevention is important, there is a shift towards preventing stunting.

Family 3: Factors used to target nutrition interventions (nutrition status, child age, multiple outcomes). Interventions are targeted at all children up to a certain age or for those who are malnourished.

Family 4: Recognition of nutrition “camps” and ideas for building harmonization (camps, harmonization). In general, the camps are focused on developmental issues such as stunting or emergency issues such as wasting. While respondents agree there should be harmonization, there are practical barriers currently.

Family 5: Research perspectives (Research perspectives). There is great research in understanding the importance and impact of malnutrition, but it is not reaching policy makers. The nutrition strategies of the organizations showed that multi-national organizations are more likely to implement multi-sectoral approaches and that the wasting prevention strategies that are well researched and known to be life-saving are being implemented.

Conclusion: While each organization has a different focus area, their main concern was for children to grow well and prevent them from being malnourished. Most organizations agree that there should be harmonization and a multi-sectoral approach and acknowledge that there will be barriers to achieving this such as funding and manpower.

INTRODUCTION:

World Health Assembly 2025 targets call for reducing and maintaining the global prevalence of wasting (weight-for-height [WHZ] < - 2 SD) among children under five to below 5% (WHO, 2014). Currently, 8% of children are wasted; global progress towards the 2025 target is classified as off-course. (Global Nutrition Report, 2017). Just 29 of the 57 classifiable high-burden countries are on-course to meet the wasting target (Global Nutrition Report, 2017). Moderate and severe wasting are associated with increased risk of morbidity and mortality, with severely wasted children nearly 12 times more likely to die by 5 years compared to healthy children (Olofin et al, 2013). A range of intervention strategies to treat and/or prevent both moderate and severe wasting as well as other forms of undernutrition are being scaled up across high-burden countries (Bhutta et al, 2013).

However, we are unable to adequately anticipate or assess the combined impact of these interventions as we lack a clear and actionable typology of wasting prevention interventions and pooled estimates of their effectiveness on wasting and its immediate determinants (e.g. dietary intake). One of the primary factors influencing the "substantial ambiguity" that currently exists in terms of how interventions that prevent wasting are characterized is that the global nutrition community is generally divided into two "camps" when it comes to interventions addressing poor growth of children 6-59 months of age (Lenters et al, 2016; Briend et al, 2015).

One camp is the *prevention of early childhood stunting* (height-for-age [HAZ] < - 2 SD); it focuses on the short-term impacts on mortality from infectious disease and child development as well as longer-term effects on educational attainment and economic productivity.

Even though these education and/or supplementation interventions are planned with stunting reduction as the primary outcome, it is reasonable to assume that improved Infant and Young Child Feeding (IYCF) practices and/or macronutrient supplementation also impact wasting. Unfortunately, we lack a sufficient evidence base to support these potential linkages as trials designed with stunting as the primary endpoint have not consistently reported on weight-for-height outcomes in a way that can be compared across studies (Heidkamp et al., 2016). Rigorous education or supplementary feeding trials with wasting as the primary endpoint are even fewer (Lenters et al., 2013). The most recent review of the growth impacts of complementary feeding interventions for children 6-23 months does not even report weight-for-height or wasting outcomes (Lassi et al., 2013).

The other camp is *prevention of severe wasting through treatment of moderate wasting* (also called severe [SAM] or moderate acute malnutrition [MAM]) as well as *blanket supplementation programs* during high risk periods. These interventions are typically targeted to children who are identified as malnourished during clinic or community-based screening activities based on defined middle-upper-arm circumference (MUAC), weight-for-height or edema criteria (Lenters et al, 2013). In Mali, a comparison of lipid based supplementary food (RUSF) when compared to other grain-based foods demonstrated that RUSF was the most effective and had higher sustained recovery rates. This shows that lipid based fortified foods can be effective to treat MAM and to prevent SAM (Ackatia-Armak et al, 2015). Another study treated MAM with either context appropriate child-centered counseling (CCC) or supplementary fortified foods. After a 3-month treatment, it showed that supplementation was the better option. The authors did note that counseling can be an alternative as long as the

participants show up to the meetings (Nikiema et al, 2014). This other study also used lipid based or grain-based supplementary food to treat children with MAM. They received it for 16 weeks. The results confirmed that the lipid based supplementary food had better outcomes. This shows that food supplementation really does help with the recovery from MAM (Karakochul et al, 2012).

There is clear overlap between the strategies used by the two "camps" – both involve nutrition education and/or supplementation (often with very similar products). Both aim to improve growth outcomes among children in the aged 6-59 months through improved dietary intake (Briend et al, 2015). As seen by the examples above, there is used of similar treatments for both stunting and wasting prevention (nutrition education, fortified foods or ready to use foods).

Despite these similarities, current reviews of interventions for improved child growth tend to be compartmentalized under the typologies described above (stunting prevention vs. wasting treatment). Little effort has been made (which can be related to funding or resources of the organization) to harmonize the approaches used to evaluate these programs in terms of outcomes, metrics, overall design. A recent review identifies that, in high-burden contexts, case studies are needed to demonstrate the impact of implementing joint wasting and stunting prevention and linked treatment programs (Briend et al, 2015). The authors note the need for documenting the policy and programmatic lessons from linking wasting and stunting and to provided clear monitoring of outcomes from these interventions.

Most organizations use similar interventions for different purposes and do not recognize the potential to use these interventions to target other issues. Some people have tried to tackle both with one intervention. One study provided counseling to the parents at baseline, 4 and 8

weeks; additionally, they gave oral nutrition supplements (ONS) of protein and micronutrients to the kids twice daily for 48 weeks. They showed that this helps increase WHZ and HAZ (height for age z score), it reduces the number of sick days, and it increases appetite and physical activity scores. This shows that a combination of nutrition education and oral supplements can improve outcomes for wasting and stunting (Huynh et al, 2015). However, studies that jointly target wasting and stunting are sparse and there is a data need in this area to document outcomes from interventions that can potentially be applied to both nutritional outcomes.

A good starting point for this process of harmonization is to better understand how program planners and policy makers understand interventions to address malnutrition in children. Policy makers and program planners have to make timely decisions about which intervention strategies to implement that are rooted not only in sound evidence of effectiveness for their contexts but also factors such as cost and feasibility.

To this end, the goal of this study is to investigate the perspectives of policy makers and program planners in low and middle income (LMIC) countries to 1) identify typologies of interventions for primary and secondary prevention of wasting; and 2) to analyze the strategies of 12 nutrition organizations to identify their current approaches related to stunting prevention, wasting/acute malnutrition treatment, and wasting/acute malnutrition prevention.

METHODS

We conducted key informant interviews among nutrition professionals involved in the design, evaluation, and/or implementation of nutrition interventions. We sought to recruit participants whose work is based specifically in one of six focal countries (Bangladesh, Burkina Faso, Kenya, India, Mozambique, and Tanzania), or who manage a nutrition portfolio that manages nutrition

interventions that are implemented in multiple countries, but that include at least one of these focal countries.

We conducted a total of 23 key-informant interviews, of which 16 were based in one of the five focal countries, and seven from multinational institutions that conduct nutrition research in more than one context. Eligible participants were identified through recommendation by 1) nutrition experts with contacts in the selected focal countries; 2) non-governmental organizations that work in multiple low and middle-income country contexts, and 3) contacts from interview participants.

Following email recruitment and consent of participants, interviews were conducted over Skype or a phone call. Interviews were conducted in English and lasted between 30 and 60 minutes. Following informed consent and after obtaining permission to record, all interviews were audio-recorded. Interviews were conducted by one researcher with extensive training in qualitative research and global nutrition research (SI). The study procedures were approved by the Wheaton College and Johns Hopkins University Bloomberg School of Public Health Institutional Review Boards.

Questionnaire development:

Interview guides were developed from the study questions. These questions focused on: 1) identifying current nutrition interventions; 2) the classification of these interventions; 3) participant's recognition of and current application of "wasting/acute malnutrition" intervention approaches; and 4) ideas for building harmonization between the respective stunting prevention and acute malnutrition treatment camps (if recognized as distinct entities).

Separate questionnaires were developed for country-specific and multinational institutions (Appendix Guides 1 and 2, respectively).

Data analysis:

Interviews were transcribed verbatim and uploaded to Dedoose Qualitative Analysis software. Four trained research assistants coded the transcribed interviews. These researchers attended two training sessions on coding qualitative interviews and were instructed on the meaning of each code. The first two interviews were used as a test case to ensure inter-rater reliability of at least 90% was achieved. On the rare case of a coding ambiguity, researchers consulted with the co-PI (SI) to clarify the appropriate code. All interviews were double coded to ensure consistency of data classification.

Codes were developed from interview guides and themes that emerged during the analysis. Following coding of rich text excerpts, rich text quotes were extracted along with the participant focal country. Code reports were produced for each code to be analyzed and were then grouped into families.

Organizational Analysis:

We accessed national or institutional strategic documents and reports from intervention mapping, landscaping or related efforts that identify key interventions and scale of implementation in the selected contents. Our aim was to identify a) the types of nutrition education and food or macronutrient supplementation interventions implemented among children ages 6-59 months; and b) how the plans and reports classifies and describes these interventions. We will access the plans of national organizations who were active in South Asia and East Africa; have a reasonably high-profile; and, have a large nutrition portfolio. strategic

plans we have identified include: Children's Investment Fund Foundation (CIFF)'s strategy; United States Agency for International Development's Multi-sectoral nutrition strategy; The Bill and Melinda Gates Foundation Nutrition Strategy; the World Food Program Strategic Plan; and Catholic Relief Services Nutrition Overview. These were picked because they have active and known research in the Child Nutrition prevention and or therapeutic feeding / emergency nutrition space.

RESULTS:

We identified 15 initial codes (Appendix Guide 3) that were further grouped into five main families: 1) intervention types and categorization; 2) treatment of moderate acute malnutrition and prevention of wasting; 3) factors used to target nutrition interventions; 4) recognition of nutrition intervention "camps" and ideas for building harmonization, and 5) research perspectives on wasting/acute malnutrition prevention.

Family I: Intervention Types and Categorization

Nutrition supplementation

Stakeholders describe the main goals for nutrition supplementation as the treatment of malnutrition and the prevention of stunting.

Based on the responses, one of the goals of nutrition supplementation is to treat malnutrition and organizations do so through "therapeutic feeding programs and using RUTF [ready to use

therapeutic foods] as the main therapeutic strategy" (Multi). Other places use "micronutrient enriched foods supplements" (Tanzania).

Organizations "think food interventions are probably very appropriate, but in a very small quantity, could be small quantity LNS" (Multi). They believe this is the winning idea to use "a mixture of micronutrients and milk powder. This can be a dry powder that can be dumped onto someone's porridge." (Multi). Micronutrient supplementation is really important when it comes to addressing problems of undernutrition.

The categories of nutrition supplementation include micronutrient supplementation, lipid-based nutrition supplementation, and macronutrient supplementation. While macronutrient and lipid-based nutrition supplementation are focused on infants, micronutrient supplementation is focused on pregnant mothers and infants.

Micronutrient supplementation includes providing "pregnant mothers and breastfeeding mothers, food with micronutrients. We have packages that we give to those mothers and children" (Tanzania). Additionally, there are milk powders and micronutrient packets given out as previously stated. "they receive F75 and F100 [Formula 75 and Formula 100], they are micronutrient enriched foods supplements–they are rich in micronutrients" (Tanzania). They are milk formulas high in protein, calories, and fat; they are used to treat SAM and either have 75 kcal or 100 kcal per 100 ml.

Another form of supplement is using lipid-based nutrition supplements (LNS). A respondent noted that it is an appropriate intervention for stunting, but they use "a very small quantity,

could be small quantity LNS [SQ-LNS]" (Multi). The advantage of using small quality LNS since it can "be added to be added with some larger amount of food that is cooked" (Multi), which makes the food safer and people will consume more food.

Another form of supplementation would be to use macronutrient supplementation. This includes the use of therapeutic foods. The organization is "using RUTF as the main therapeutic strategy so that's one important strand of things." A new idea is using "RUTF on the whole continuum but a different dose. So, children who have both SAM <150 MUAC would get 2 packets a day of RUTF and children who enter at MAM or who progress to MAM go to one packet a day" (MK UK). This is about giving children foods that have all the nutrients they need.

Nutrition education

While a majority of nutrition education is done through individual household counseling and using health workers to do community-based education, respondents also recognize the importance of using mass media and government led initiatives to reach a broader audience.

Nutrition counseling is a very important part of education interventions. An example is "Timed and targeted counseling. That is really a community health worker model that really they visit households at certain points in time and you target whatever you are saying at that stage of pregnancy or at that age of the child" (Multi). This helps individualize the information and makes it more applicable to the family. Instead of having broad education classes, this type of counseling would help the families focus on a few simple changes at once instead of having to

remember all the information and apply it when it is applicable. This also builds rapport between the community workers and the families since they are meeting multiple times.

Community based programs are also a large part of education interventions. This includes "mother-to-mother groups or community dialogues" (Multi) and extension workers "who are providing the knowledge on how to grow and take care of the garden and the produce" and community health workers "will go and provide education on nutritious foods that the foods can take including the vegetables that they are growing" (Tanzania). This idea is more about empowering the community to learn skills and rely on each other to reduce health problems and malnutrition. The classes for home gardening help to change the way that they approach food.

While traditional forms of nutrition education are great for the community, certain countries are moving towards mass media communication and involving the government for country wide initiatives. One respondent cited giving "different messages for education through ... radio, tv, wherever possible. Sometimes the media will call us to educate the community so we go there and with some topic to talk about something, so the population gets to hear and learn something from us" (Tanzania). Another respondent talked about country-wide initiatives including "expanding iron/folic acid supplementations for pregnant women, increasing in working on developing packages or services for maternal nutrition primarily around counselling and trying to increase the quality of information that pregnant women are getting about the importance of diet during pregnancy" (Bangladesh). These interventions are more about changing the environment so people can easily access information or supplementation.

Nutrition education is mainly targeted at mothers to increase knowledge about diet during pregnancy, exclusive breastfeeding, and increase food security. Participants identify that these strategies will have an eventual impact on child growth.

The goal of all of these programs is to "prevent children from not growing well" (Multi). They do so by having a food security portion and having more "packages or services for maternal nutrition primarily around counselling" (Bangladesh). They emphasize the importance of diet for mothers and children throughout the pregnancy, before pregnancy, and after childbirth. So, these interventions are mostly targeted at "women during pregnancy and women of childbearing age" (Multi). A majority of participants agreed that the pre-pregnancy interventions are needed and important to prevent growth faltering in utero. There was widespread recognition of the "first 1000 days" concept and the relevance of this time window for delivering effective interventions.

Intervention Types and Categories

The organizations cited many interventions which are represented in the following table:

Table 1. Types of Currently Implemented Interventions Identified in Key-Informant Interviews

Micronutrient supplementation

- Vitamin A supplementation for child under 5
- Zinc supplements for children under 5 with diarrhea
- Multiple micronutrient supplements to pregnant women (especially iron and folic acid)
- Iron and folic-acid supplementation to pregnant women
- Salt iodization

Macronutrient/Food Supplementation

- Provision of SQ-LNS to young children
- Distribution of LNS to all young children in an area
- Provision of food-based supplements to moderately malnourished children
- Distribution of lipid-based nutrient supplements (LNS) to pregnant women
- Distribution of targeted supplemental food rations to special populations including young children
- Distribution of household food rations (e.g. food baskets) to all households in a community/region

Therapeutic foods

- F75 or F100 for children with severe acute malnutrition
- Provide RUTF for children with severe acute malnutrition

Nutrition Education

- Handwashing/ water, sanitation and hygiene promotion
- Behavior change communication for improving dietary quality of children under 2 years]
- Nutrition education and counseling for pregnant women
- Cooking demonstration for caregivers of young children
- Complementary Feeding Promotion/Education for children under 2 years
- Positive Deviance/Hearth programs for children

Preventative Monitoring

- Screening of children under 5 using MUAC
- Growth monitoring and promotion (weight and sometimes length/height over time) for children

Mass Media Communication

- Nutrition promotion through mass media or community health worker-led nutrition education
- Counter-marketing against breastmilk substitutes

Nutrition Sensitive Interventions

- Deworming for women during pregnancy
- Deworming for young children
- Advocacy for maternity leave

Family II: Treatment of moderate acute malnutrition and prevention of wasting

Wasting and acute

Most respondents use "wasting" and "acute malnutrition" interchangeably. To some there are distinctions in how to categorize acute malnutrition, but they still use the two words interchangeably. One respondent noted that wasting may be more powerful than malnutrition, but to organizations, they are the same.

Many of the respondents state that "wasting and acute malnutrition? I'm using each for the same condition" (Mozambique). For certain people they "understand the difference because sometimes acute malnutrition is not wasting. Wasting is the status for when you are already thin. But in general, they are the same thing, wasting and acute malnutrition" (Burkina Faso). This appears to be a common theme through most of the organizations we interviewed.

A very interesting comment is that malnutrition can be overused and the public does not pay as much attention to it. However, "when you are portraying this to government and bilateral programs and to donors then wasting kind of grabs their attention" (Multi). It seems that to people who work in this area care about both equally, but if they are trying to increase the priority of an issue they may use wasting to draw more attention.

Importance of MAM

Organizations were divided on whether or not MAM is important and whether or not it needs to be treated. The difference came from what context they were working in, where the

funding comes from, how they emphasize acute malnutrition compared to stunting, and the services available.

Some organization really prioritize it and have a lot of interventions related to treating and preventing MAM. For some it is important because it is in their "goals and objectives of our organization. It is something we look into a lot and we have specific sometimes" (Tanzania). Organizations also prioritize it because they work in fragile contexts and that is where you see "wasting or acute malnutrition being more prevalent and being more of a problem than say stunting or just dietary intake and quality" (Multi). It really depends on the context or country that is focused on. Funding will also drive the focus of an organization. One respondent cited that "sometimes donors prefer to invest in treating acute malnutrition so sometimes more is spent on wasting" (Burkina Faso). If donors truly think this way, wasting may continue to be emphasized.

There seems to be focus on treating SAM in many countries and "if the child is severely malnourished and also having complications they have to be hospitalized. If they have good appetite, no fever, no underlying infection then they can be at home and managed at home" (Tanzania). Some countries only have "one guideline and that is for the facility-based management of children with severe acute malnutrition, but with complications" (India). For countries that do not have programs like Community-based Management of Acute Malnutrition (CMAM), they believe that there should be and that "is a massive gap in the coverage of services" (Bangladesh). This could be because they only see SAM as a condition that needs to

be treated in a hospital and MAM is not as serious or because “it’s becoming difficult if you look at very micro-level health centers are you are asking them to handle all of the current set up with maybe just on doctor and then the malaria cases and the all the births and the medical complications and then you add of MAM and it just becomes unsustainable” (Senegal). Since it is not as urgent as some other cases, doctors will not treat it because they have other patients with urgent issues.

However, in some respondents’ eyes, they believe “it is unethical to allow children to deteriorate in SAM before we act and so by doing a combined protocol we are addressing both but we hope that over time we can prevent that SAM” (Kenya), so there should be an emphasis on treating MAM because respondents agree that preventing SAM is a priority. They would rather catch it early and treat MAM which is less severe than have children develop severe cases that are less manageable and potentially more expensive to treat. While it is important to emphasize MAM to prevent SAM, not all countries have the capacity to do so.

Concurrent with these findings, some organizations are shifting away from MAM and working more on stunting. Some state that the shift is happening because “agencies in charge are tired of it” (Multi). The trend seems to be that countries are prioritizing “stunting as the bigger picture not just wasting” (Tanzania) because it has become “a big, big, big objective in the world” (Burkina Faso). Places where wasting may not be as much of an issue, they work on more developmental related issues like stunting.

While some are leaning one way or the other, there are respondents that promote a more holistic view of the child or equal emphasis on acute malnutrition and stunting. A respondent recognized that “the two are interrelated so that wasting is a risk factor for later stunting

likewise stunting is a risk factor for wasting" (Multi). Due to the overlap, many consider both conditions equally.

Moderate severe

For acute malnutrition in theory there is a distinction between moderate and severe; however, the set quantitative cut-offs are interpreted differently depending on the context. In a few countries they just see it as a continuum of the same problem, they are all malnourished, and there should be no defined distinction between the two.

Respondents state that for wasting "we distinguish between moderate and severe and I don't utilize the moderate and severe distinctions with stunting at all. I honestly don't within my programing and haven't seen any donors be specific to say" (Multi). For acute malnutrition, there are specific number cut-offs: "moderate recurring as children with acute malnutrition with less than minus 2 Z score" (Mozambique). The distinction for these organizations is very clear. They use weight-for-age Z score (WAZ) or MUAC to measure the children and make the distinctions for wasting, but there are no specific cutoffs for stunting.

However, some people believe that it should not be broken up so specifically. They believe that it is "problematic and I think it's sort of an artificial cut between SAM and MAM and kids go back and forth. In a week they might go back and forth for heaven's sake" (Bangladesh). It is hard to classify the kids because the conditions for the children change so rapidly. Some see it as a continuum, they believe "MAM and SAM are part of the same thing" (Multi). There are organizations that are working on programs that will "eliminate this SAM-MAM distinction and

use one product with one protocol, one program" (Multi). These organizations would argue that the distinctions are just making things more complicated and everyone should be treated for malnutrition if they have it.

Wasting prevention examples

How each organization works towards wasting prevention is different. The categories that the interventions fall under include nutrition education, water and sanitation for health (WASH), and micronutrient and macronutrient supplementation. Some programs are packaged together to be multisectoral in preventing wasting.

Table 2. Examples of Wasting Prevention Activities Identified in Key-Informant Interviews

Nutrition Education • Adolescent, maternal, youth, child nutrition education (AMYCN) • Infant and youth complementary feeding (IYCF) promotion • Oral communication • Feeding, young child feeding, breastfeeding, sensitization • Frontier personnel and mass media communication • Information, recommendations, supports around dietary advice (frequency, type of products, type of foods) • Nutrition counseling if child is at risk • Diet diversity and quality
WASH • Water, Sanitation, and Hygiene (WASH) to break cycle of central drinking dirty water
Micronutrient Supplementation • Vitamin Supplementation twice a year
Macronutrient Supplementation • RUTF
Multisectoral Treatment • MAM treatment

- Scale Up Nutrition (SUN)
- Package
- Vitamin A
- Deworming tablet
- Education and referrals (salvia and need counseling)
- Moderately malnourished
- Supplementary treatment (ready to use foods, medical treatment, vitamin A supplementation, deworming, and medical work)

When the key informants were asked about interventions their organization does, this is the list that was compiled. When reading through the nutrition strategy table, these themes will come up again as areas that are focused on when organizations try to prevent wasting.

Wasting prevention types

Wasting prevention as a topic is understood by government officials and health workers, but it is not as much of a priority. The focus is shifting towards prevention of stunting.

Wasting prevention is a concept that is discussed and understood by people who work in this area. So, “development partners...government officials especially those who are working with nutrition interventions or Christian programs, but not the community” (Tanzania) would understand. It is prioritized in the field when “they see the cost effectiveness in it [and] it’s unethical to allow children to (deteriorate) into SAM before we act” (Multi). To these people, wasting prevention is recognized and is a priority for them. If your partners recognize wasting prevention has a priority then that would be an area of focus. One organization states that

"what we do around acute malnutrition is closely linked with United Nations Children's Fund (UNICEF) and these are discussions we have all the time" (Senegal).

However, in some areas "because your reach in a wasting program is going to be a lot lower, just because not as many people are affected, though affected in a much more acute way. It tends to be deprioritized a little bit" (Multi). It really depends on the context of the country and what their priorities are. In the latter organization, the areas that are reached are not as affected by chronic wasting, so it is not seen as cost effective or beneficial to the countries to put it as the biggest priority.

Many organizations have entirely shifted their focus to another problem. One respondent was under the impression that "I don't think there is an organization that is focused on wasting, but I know there is management and treatment." (Tanzania). These interventions appear to be secondary to the other interventions that the organization is more focused on.

According to responses, for the "general population around stunting and chronic malnutrition and how to prevent that but I think the wasting prevention may or may not stick with people" (Multi). While wasting may still be a problem in countries, developmental issues like stunting and chronic malnutrition become more of the focus. There is a shift in this paradigm to emphasize working on chronic issues.

Family III: Factors used to target nutrition interventions

Nutrition status

Respondents state that nutritional status is considered in interventions regarding supplemental feeding and management of childhood illness, but interventions related to behavior change and vitamin A supplementation is given regardless of nutrition status.

Nutritional status is one way that organizations use to determine what interventions are given to children. Organizations provide education on feeding to kids who are malnourished or severely malnourished. Additionally, "targeted supplementary feeding is generally done on MUAC and it would be less than 12.5. SAM is generally less than 11.5 MUAC" (Multi). They use these as measurements of nutritional status and determine who is malnourished and needs feeding.

However, there are certain interventions that are given to all kids regardless of their nutritional status. For example, "neonatal vitamin A is for all kids and does not look at the nutritional status. All children who were accepted were given the intervention or a placebo." (Tanzania) and "[Social and Behavior Change Communication] SBCC is about the change, it's better that you target the whole community because tomorrow, today not all households available." (Tanzania). These interventions are for all children because all children benefit from these changes and they are not specific to a condition.

Child age

For children under 6 months, respondents report they work with mothers to promote exclusive breastfeeding. When children reach the age of 6 months, infants are tracked and will qualify for food supplementation, micronutrient supplementation, or other ways to manage malnutrition. Generally, children are followed until 59 months unless that country has high burden, then children are followed until 36 months.

Another way to determine which interventions are given is based on the age of the child. The respondents are in accordance and believe that "one that should be breastfeeding for 6 months and the one that start feeding 6 months to 23 months" (Mozambique).

Past the first 6 months, there are different interventions including "empowerment in terms of providing access to food" (Tanzania), "supplementing the food that is provided by the family" (Mozambique), "vitamin A, macronutrient supplementation...deworming" (Mozambique) to help with growth, and "blanket supplementary feeding" (Multi). These interventions teach the family about food security and provide families with the food needed to help their children grow. These interventions are all aimed at children who are younger to prevent growth faltering.

Some organizations are "working with caregivers and their young children to identify what are the positives of child feeding behaviors in the community, and then that program specifically targets children that have already been shown to be falling off their curve in terms of growth. So before they start they take the weight of all the children and then identify those that are not

following their growth curve" (Multi). After the initial assessment, it becomes more about empowering the community and using "local foods to prepare a meal that a family would be able to provide for that child. So it is not providing food from outside or it's not a purchased product" (Multi). This is a classic example of compiling assets in the community and then using those assets to encourage healthy behavior.

When the tracking stops depends on the country and their burden. "targeting children from 6 months to under 5. Some countries if there is a really high burden it would be 6 months to 3 years of age" (Multi). The interventions mentioned above are specifically for younger children to prevent growth faltering and monitor growth.

Multiple outcomes

Respondents gave different examples of multiple outcomes. Most of the interventions are focused on nutrition education and behavior change for households.

Table 3. Interventions with Multiple Outcomes as Identified by Key Informants

• Nutrition Education
  ○ AMYCN
  ○ Women's Empowerment and maternal nutrition

• Behavior change
  ○ IYCF – complementary feeding and breastfeeding
  ○ Keeping livestock
  ○ Water safety and hand washing

• Clinical Care
  ○ Standardize care in community clinics
  ○ Malnutrition treatment

Respondents reported these as interventions that would affect multiple areas such as both stunting and wasting or stunting and acute malnutrition, etcetera.

Family IV: Recognition of nutrition "camps" and ideas for building harmonization

Camps:

Theme #1: Respondents generally recognize the presence of "camps" that are responsible for nutrition programming in their context; however, the extent to which these camps are divided depends on a variety of contextual factors such as national efforts for coordination and integration of nutrition programming, the organizations responsible for nutrition programming, and donor priorities. These camps are generally thought to describe prevention of stunting and treatment of acute malnutrition/wasting.

Theme #2: Within some organizations and some countries, there is evidence for a lack of division resulting in a unified approach by one organization and/or well-coordinated, high-level efforts to address both prevention of growth faltering and treatment of wasting.

The camps appear to be "developmental, preventative nutrition as opposed to emergency nutrition" (Mozambique). What constitutes as developmental and preventative is more related to stunting and emergency nutrition is more for wasting or acute malnutrition. However, the context in which it is applied to matters. "Because we have a lot of places that aren't acute emergencies that have a high wasting burden" (Multi). One of the examples is it is "every day at least a lot of children suffer from acute malnutrition…it's not an emergency issue, it's a development issue… we succeed to implement scaling up program for treating severe acute malnutrition. It's not an emergency response. It's a development response" (Burkina Faso).

What organizations focus on though also depends on where their funding originates from and what the funders are interested in. “The donors or guidance to stunting or the NGOs that are specialized in stunting reduction programs or prevention programs are radically different than the ones that are funding, by the way I’m already saying wasting” (Mozambique). Global guidance is important too. “Many other partners for example, like various philanthropies in India and others are more focused on the prevention aspect of it. Most philanthropies and partners are engaged in the prevention of stunting aspect. The thing is, it all depends on who is funding and what is the mandate of the department who is funding” (India). Whether these organizations focus on stunting or wasting, depends on the direction that their donors would like to follow; it has to be appropriate to the issues faced in the country too.

For some organizations that have funding from different streams they find it takes “awful lot of coordination between the two so I think increasing interest in looking at combined approaches.” (Multi). This is not a simple effort though, it takes a lot of coordination for a whole country to be on board with this idea. “It is not a small project, but at the national level you need a multi-sectoral approach” (Tanzania). However, there are organizations that are already trying to cover them both, so they can learn from each other.

“I think we work fairly well with them, I think everybody has their niches. There is certainly obviously a competition for resources, but, I think … we have come together fairly well” (Multi). For some countries they are “very well coordinated and I told you we have the high levels yet bringing all the stakeholders are the high level, the UN, the donor, the business at work, the academia, you know, they got all the, you know at least twice a year he's looking at the records...we've picked the same language, we are saving the same plan, you know, so we are

following you wherever you are working in this big country, but you have a road map to follow" (Tanzania). It is really important that everyone comes to the same understanding and is on board.

While it takes a lot of coordination at the organization or country level, it can be done and people are trying to get it done: "I think more of the problem is trying to bring together different sectors around multiple countries so that everyone brings their contributions to the table" (Senegal). Additionally, in one place, there was only one group and they cover both areas. Slowly people are having more of this conversation. And some people believe more conversation must happen around this topic.

Harmonization:

Theme #1: There is general support that greater harmonization would be helpful between prevention and acute malnutrition groups, however there is some caution about merging effective programs with programs that still lack a strong evidence base.
Theme #2: There is a belief that funding for integrated programs is expensive.
Theme #3: Participants describe joining these two communities under an overall objective of reducing undernutrition in children and preventing mortality.

In general, people agree that harmonizing interventions is a good idea. One organization framed it as our ultimate goal is to keep kids well-nourished and all issues should be addressed instead of having separate interventions. A respondent stated that "our focus is on integrated

programming so in our core model of these program development programs, we want to see harmonization and again children that are well nourished, and we would look to integrate as many approaches as possible to meet that ultimate goal" (Multi) Some people recognize that there is overlap because "we know that children who are both wasted and stunted have the highest risk of mortality and so there has been a lot of talk recently about even blurring those lines even more" (Kenya). To these people it is important that they "stop talking about stunting versus wasting and just talk about child growth in general" (Multi). Since there is research to show that these two conditions are related, it is better to look at the children holistically instead of focusing in on one condition.

In order for this to happen smoothly, it needs to involve high level stakeholders. One respondent stated that they are well coordinated because "all the stakeholders are the high level, the UN, the donor, the business at work, the academia... It's all these groups that get together on a quarterly basis...we've picked the same language, we are saving the same plan...you have a roadmap to follow" (Tanzania). There are these people who are making decisions on how to move forward, so they have the influence to harmonize the interventions. To prevent it from being fractured you need to have a "sort of goal there and you need to have a national nutrition policy that brings it all together...with an understanding of what the country is focusing on and how it's going to do it" (Multi). There are groups that understand how to harmonize and have been working well to harmonize interventions.

An interesting comment that was brought up was "prevention of malnutrition is a shared goal among everybody but I don't see major division between these two communities at the national level and maybe at the local level there are more of those divisions, but I think at the

national level...they are all kind of working towards the same direction" (Senegal). So the important part is for people working at the local level to understand that there is no need for such specific divisions between these camps.

Something that people struggle with is that the policy makers are not actively working with the people, so they only see statistics. Statistics do not tell stories of the people and what things are important to address at the time. One way to do it would be "the people on the ground that are actually implementing nutrition programming are actually the same people that are scaling up their treatment for wasting in emergencies and they are the same people that are investing in chronic malnutrition and stunting and all those issues as well" (Multi). While this would be ideal, this is not always possible. So, it is really important for those who work with the people directly to have the opportunity to help policy makers and people planning interventions the most important areas that need to be addressed. For example, "what moderate, severe acute malnutrition indicates for the overall nutritional status of a community can help from a programmatic perspective, because it would force us into a situation where we would be more proactive in monitoring it, and it would help up drive developing interventions" (Multi). The people carrying out the interventions may know this, but that may not be clear to program planners. There are more discussions that are happening and there is "a very good opportunity here to make this all work together" (India). Starting the discussion is very important first step.

There is some push back from one organization. There is a belief that trying to harmonize the two together would hinder certain programs that already work well. The respondent stated that there are "plenty of stunting prevention and acute malnutrition interventions. I think that trying to hitch a train car without wheels to treatment of acute malnutrition (something that

really rolls) is unnecessarily damaging to a good program than rather helpful to a bad one" (Multi). While harmonization is mainly recognized as beneficial, for certain organizations or context, it could actually be harmful.

Another concern would be funding and where that would come from. There is work done on "integrating packages… [but] I think the bottom line though is funding because it would be wonderful to work at that level but it takes huge amounts of funding to implement those integrated packages and a lot of donor money isn't there for that" (Kenya). At times it could come to trying to "support the two programs using the same strain of funding, same resources, and same people" (Mozambique). This can lead to restrictions in what a program can do because of lack of funding. Again, while this may be a good idea, there are limitations in implementing these ideas and they must be recognized.

Family V: Research Perspectives

Research perspectives:

Respondents state that there is good research and information produced, but this information needs to be effectively translated to policy makers so they can understand the urgency of the problem.

Respondents state that they do delve into the literature to understand what the current trends are and where the research is going. They also use global targets developed by WHO or SUN to guide programs created. It is important to look at the research but then "leverage and look at our country situation and also our local, you know, local research" (Tanzania). Government

officials also have access to broader research and the goals for global nutrition, but what is really important is the data coming from their own country. So, one important step is "making sure that then that data gets incorporated into their government national database so that's available to every district to really see if they can set targets and they can move to improving the coverage of services in their district" (Bangladesh).

After all of the information is present, government officials need to see it and really use it to understand the urgency of various problems. This is where interest groups enter the picture; they need to do a lot of advocacy for the cause of nutrition and show the data to policy makers. Because "policy makers and programmers of course won't know that and they are not expected to know that" (Multi). So, it is important to have interest groups like "WAS TIG as it's called, the Wasting Stunting Technical Interest Group...so we brought WAS (wasting and stunting) and MAME (moderate acute malnutrition) together and we brought a whole host of people into the room [donors, academics, foundations]. So, we had a day of presenting our WAS work and our MAME work to people who haven't necessarily been exposed to the technical developments in our work" (Multi). Having this space to present work helps to get others on board with the idea that wasting and stunting are immediate issues that must be addressed. It is a time to translate all of the research into practice and be able to understand the situation together.

New research has shown that WAZ is not the best way to measure for malnutrition and using MUAC is better and community health workers and household members can be trained to use it. However, context must be considered when using these measurements.

In the past, WAZ has been used to measure malnutrition. However, “looking again at weight-for-length coming out as the poorest predict [of death]. I guess it maybe just over-adjusts” (Multi). So “(MUAC) plus (edema)” (Multi) “is better at measuring mortality...so we are really honing in on that and we are not the only agency doing that as I am sure you know” (Kenya). The benefit of using MUAC, besides it being a better predictor of mortality, is that “mothers can adequately identify their own children and that children through [mothers measuring MUAC] were coming in much earlier before it got severe” (Kenya). This reaches much more people and organizations are empowering more people to identify the signs of malnutrition.

While MUAC cutoffs are great, the context is important to consider. “Different settings where body profiles especially have profiles of currently SAMs being identified by either weight-for-height or MUAC ...the overlap is really dramatically different in different areas. I think there is a really need to understand the need to have a simple typology of context as well as descriptors” (Multi). People of different ethnicity may have different body build up which needs to be considered for anthropometric measures.

While having numbers and cutoffs make it easy to visualize and measure certain things, understanding the context can be important when it comes to treating the issues. “thinking a lot more about underlying causes because I think we’re missing something. I think don’t think it’s deliberate but inevitable result of the success of RUTF but not all detriments are to lack of food and there’s a big need to think about what the other causes are and begin to fight bias here. Disability being one big one and not links for the moment and I think improving that is a very important thing to pick up one” (Multi). In other places “it seems like seasonal, the season in which you are born has very profound implications in terms of your ability to get to your

mean...so the ones born in the wet season, the lean season, continue not to catch up, where those born outside of the lean season, the wet season, do better" (Multi). This is not related to anthropometrics, but in certain areas, season or disability play a role in determining who will have malnutrition and who will do better. All of these factors must be considered when developing new interventions.

A new direction that respondents have reported on is treating the child holistically instead of looking at one condition of MAM, SAM, or stunting.

While traditionally MAM and SAM are treated as separate conditions, organizations are moving towards "Combined treatment of the same product. So, using RUTF on the whole continuum but a different dose...it has a particularly strong evidence base and there is power in building the evidence base" (Multi). This opens the door to more treatments and you are less "kind of constrained by your tools for wasting and your tools or interventions for stunting but start to see the child as basically having very similar, I mean, if you look at what we know about the risk factors to wasting and the risk factors to stunting, there's very little in the literature that tells it they're different" (Multi). Since the research is not showing that risk factors are very different, it is better to prevent them with the same intervention and to think about packages that could benefit the child's growth in general. This demonstrates the direction that many organizations are going in, they want to holistically treat the child and have the mission of overall healthy children instead of just focusing on one managing one condition the child has.

Organization analysis:

Table 4: Nutrition Strategies for Various National and Multinational Organizations (Next Page)

The nutrition strategy for 12 organizations (6 multinational and 6 national) were read through and analyzed. The following table shows the strategies that the organizations use and the table is summarized into a few key statistics. Key findings include:

- 10 out of 12 organizations stated that stunting prevention was a goal for their organization. The 2 organizations that did not stating stunting prevention was a goal were both multinational organizations.
- 6 out of 12 organizations stated that treating moderate acute malnutrition was a goal. Of the 6 who did not state treating moderate acute malnutrition as a goal, 2 were national organizations and 4 were multinational organizations.
- 9 out of 12 organizations stated that preventing wasting was a goal. Of the 3 that did not state preventing wasting as a goal, 1 was a national organization and 2 were multinational organizations.
- Various interventions were stated to prevent wasting. They fall into the categories of nutrition education, supplementation, or multi-sectoral approaches. Some specific examples include: promoting breastfeeding, increase infant and young child feeding education, complementary feeding for those at risk, coordinating across sectors, food fortification, micronutrient supplementation (zinc, iron, folic acid), balanced energy-protein supplementation, culturally appropriate diets with proper nutrition, growth monitoring for children.

Table 4. Organizational analysis of nutrition strategic plans for selection national and multi-national nutrition organizations									
Organization	**Types of nutrition education and food/macronutrient supplementation interventions used**	**Classifications of interventions used in strategy**	**Is treating Moderate Acute Malnutrition Mentioned as a goal?**	**Examples of Moderate Acute Malnutrition Treatment efforts**	**Is prevention of stunting mentioned as a goal?**	**Examples of stunting prevention efforts**	**Is the prevention of wasting mentioned as a goal?**	**Examples of wasting prevention efforts**	**Types of nutrition indicators used**
Multinational Organizations									
Bill and Melinda Gates Foundation (Nutrition Strategy Overview)	Immediate and exclusive breastfeeding, complementary feeding, and fortified and supplemented food	The 1,000-day window, immediate and exclusive breastfeeding, complementary feeding, and food fortification and supplementation. We also explore new approaches, such as improving nutrition for women and adolescent girls, increasing advocacy and technical assistance, improving data systems, and strengthening food systems.	No	N/A	No	N/A	No	N/A	N/A
Catholic Relief Services (About Nutrition) A6:A13	Breastfeeding support for mothers, growth monitoring for children, training on food preparation and storage, social behavior change communication strategies.	Increasing access to quality services, engaging communities, improving household nutrition practices	No	N/A	No	N/A	No	N/A	N/A

Children's Investment Fund Foundation (Nutrition For Growth)	Appropriate complementary feeding promotion, birth spacing, interventions to increase girls' secondary schooling (in partnership with education programs), promotion of delayed age of first pregnancy, Micronutrient supplementation (including iron and folic acid), malaria prevention, balanced energy-protein supplementation	Antenatal care, Household behavior change through community agents, health campaigns, and business approaches for fortified infant and mother foods	Yes, specifically to treat an additional 1 million children per year by the year 2020	Investing in the scale-up of CMAM programs, cost reduction of CMAM, utilizing economic and development as a priority for treatment,	Yes, specifically a 30% reduction in stunting in five priority countries by 2020	Coverage of a stunting prevention package, CMAM scale-up, reports on the cost effectiveness of distributing stunting interventions	Yes	Scale up of CMAM programs or set up of new programs	Prevalence of stunting, WHZ, HAZ, MUAC
Nutrition Exchange of the Emergency Nutrition Network	CMAM; food fortification; breastfeeding; complementary feeding; promoting health, nutrition, and hygiene at school;	Increase food security	Yes	CMAM programs, and management of MAM as a nutrition specific problem	Yes	Multi-sectoral approach to improve parental education, sanitation, health services, and wealth	Yes	Projet de Nutrition Communautaire (PNC)	WHZ, HAZ
United States Agency for International Development (USAID) (USAID Nutrition Strategy)	Management of severe acute malnutrition, Preventive zinc supplementation, Promotion of breastfeeding, Appropriate complementary feeding, Management	Nutrition specific: address the immediate determinants of malnutrition, and Nutrition sensitive: address the underlying and systemic causes of malnutrition	Yes	CMAM programs, and management of MAM as a nutrition specific problem	Yes	Reduce the number of stunted children by at least 2 million, increasing breastfeeding and treating	Yes	Reduce and maintain childhood wasting to less than 5% and all of the nutrition specific interventions	MUAC and BMI

	of moderate acute malnutrition, Periconceptual folic acid supplementation or fortification, Maternal balanced energy protein supplementation, Maternal multiple micronutrient supplementation, Vitamin A supplementation, and Maternal calcium supplementation					SAM to prevent stunting, and increasing animal source proteins			
World Food Programme (WFP Strategic Plan)	culturally appropriate diets with proper nutrition, nutrition education, food security (reduce post-harvest losses), sustainable food systems, empowering women, school meals	nutrition specific, nutrition sensitive	No	N/A	Yes, Strategic Result 2: No one suffers from malnutrition. By 2030 no child is malnourished, and by 2025 the internationally agreed targets on stunting and wasting in children are met.	United Nations Standing Committee on Nutrition, the CFS, the Scaling Up Nutrition movement, and the Renewed Efforts Against Child Hunger	Yes, Strategic Result 2: No one suffers from malnutrition. By 2030 no one is malnourished, and by 2025 the internationally agreed targets on stunting and wasting in children are met.	United Nations Standing Committee on Nutrition, the CFS, the Scaling Up Nutrition movement, and the Renewed Efforts Against Child Hunger (REACH)	Prevalence of stunting, prevalence of malnutrition (overweight and wasting)
National Organizations									

Scaling Up Nutrition- Burkina Faso (SUN Movement Strategy and Roadmap)	Breastfeeding; complementary feeding; promoting health, hygiene and nutrition at school; promotion of infant foods; management/treatment of SAM	Improve nutrition in the first 1000 days	Yes, end malnutrition by 2030	Treat MAM -- healthcare access, food security	Yes	WASH, nutrition education, health care, empowering women, building food systems	No	N/A	% stunting, % wasting
NSPAN- Nigeria (Health Sector Component of National Food and Nutrition Policy)	Nutrition education to improve dietary intake during pregnancy; delay age of pregnancy; increase rest during pregnancy and lactation; encourage breastfeeding; child, infant, and youth complementary feeding counseling; nutrient dense complementary foods for children under 2;	Maternal nutrition, infant and young child feeding, management of severe and acute malnutrition	No	N/A	Yes, To reduce the number founder-five children who are stunted by 20% by 2018	Behavior change communication	Yes, To reduce and maintain childhood wasting to less than 10% by 2018	Complementary feeding for those at risk	HAZ, WAZ
National Multi-sectoral Nutrition Action Plan (NMNAP) - Tanzania	IMAM, SBCC, women empowerment, adolescent health and preconception nutrition, maternal dietary supplementation, children dietary supplementation, breastfeeding and complementary	Nutrition sensitive, nutrition specific, enabling environment interventions	Yes	IMAM, quality health care, RUTF	Yes, Reduction in the prevalence of stunting among children under five years from 34 percent in 2015 (TDHS	Infant and young child feeding education	Yes, maintain prevalence of Global Acute Malnutrition (wasting) among children under five at 5 percent	Increase infant and young child feeding education, promoting breastfeeding	HAZ, WHZ

	feeding, treatment of SAM				2015/16) to 28 percent in 2021				
NNHS- Nigeria (Nigeria-National Nutrition and Health Survey 2015)	Antenatal care and adolescent health very important; infant and young child feeding practices	Nutrition specific, adolescent, infant and young child, maternal health	Yes	The GAM prevalence for children 6 to 59 months was 7.2%	Yes	Stunting prevalence is quite stable since last year and national stunting prevalence is below regional level at 33%. Nevertheless, the situation is still critical -- above 40% -- in the Northwest and Northeast states, where 56% and 44% of the under 5 children are still stunted, respectively.	Yes	3% children experiencing stunting and wasting. 0.4% experiencing severe stunting and severe wasting	WHZ, MUAC, HAZ

UN-Mozambique (United Nations Agenda for the Reduction of Chronic Undernutrition in Mozambique)	SBCC (maternal care and nutrition, promote healthy family diets, and infant and young child feeding and care practices), fortification of food	Nutrition specific, nutrition sensitive	No	N/A	Yes, The Five-Year Plan of the Government of Mozambique (PQG 2015-2019) released in July 2015, includes the reduction of stunting as an indicator in the human and social development pillar	IYCF	Yes, the reduction in chronic undernutrition will be from 43% (2013) to 35% (2019)	Fortification of food, healthy family food practices	Prevalence of stunting, prevalence of undernutrition
WFP-Bangladesh (WFP Bangladesh Country Brief)	Supplementary feeding of moderately undernourished children 6-59 months and pregnant and lactating women; seasonal blanket feeding for children 6-23 months; nutrition and health focused behavior change communication activities	Nutrition specific, complementary activities	Yes	Treat moderate wasting, seasonal blanket feeding, CMAM	Yes	Supplemental feeding	Yes	Supplementary feeding for moderately undernourished	Prevalence of malnutrition, low birth weight,

DISCUSSION:

This study utilized key informants to understand the primary and secondary interventions for preventing of wasting. Additionally, this study looked at the nutrition strategy for 12 different national and multinational organizations to understand current efforts in wasting prevention.

Each organization has a unique list of interventions that they use to treat and prevent wasting, this all depends on the context of the country they are serving.

Intervention types and categorization

The main categories of interventions were micronutrient supplementation, macronutrient supplementation, using therapeutic foods, nutrition education, preventative monitoring, mass media communication, and nutrition sensitive interventions. Known and well researched life-saving nutrition interventions include breastfeeding promotion and support, vitamin A supplementation, therapeutic zinc supplements, iron folic acid supplementation for pregnant women, and treating severe acute malnutrition. High priority nutrition interventions include complementary feeding promotion, WASH, micronutrient powders, iron fortification, salt iodization, preventing and treating MAM, and deworming (Bhutta et al., 2008). Looking through the list of interventions cited by organizations, these were all cited as interventions used by the organizations. This shows that the research that is being done is being applied in the field.

Treatment of moderate acute malnutrition and prevention of wasting

Specifically focusing on MAM and wasting, people see these as the same meaning; these words are used interchangeably by the organizations and by people in the community. Though wasting has a larger effect since it sounds scarier to the general public than does malnutrition.

The burden for wasting and stunting, while trending down, still affect many children around the world (Global Nutrition Report, 2017). Many respondents show that there is a shift in focus from wasting prevention to stunting prevention.

Factors used to target nutrition interventions

Interventions should be targeted at those children with the highest risk of death and those who would respond well to treatment (Briend et al. 2015). Nutrition status then should be considered when deciding who to give interventions to. The respondents stated that nutrition status is considered when treatments are considered; in this case, anthropometric cut-offs are used. Additionally, child age is considered when interventions are preventative.

Recognition of nutrition intervention "camps" and ideas for building harmonization

Camps do exist; it is mainly developmental preventative nutrition versus emergency nutrition. How organizations separate into camps really depends on many factors: what the country they are serving needs the most, where their funding is from, and where the expertise of their employees lie. Research shows that wasting and stunting both increase risk of death through common mechanisms. There is no strong evidence for different interventions for stunting and wasting except when stunting occurs in the absence of wasting (Briend et al., 2015). In line with this, many respondents stated that harmonization, coordination, or having a multi-sectoral holistic approach is a goal for the organization. New ideas do not come without obstacles and opposition, but many are in favor for this shift.

Research perspectives on wasting/acute malnutrition prevention

One thing brought up is that policy makers must be able to understand the research that is being conducted. One area of research is using the most accurate anthropometrics, most organizations are using MUAC now instead of WHZ. A few has shown that the current cutoffs may not be sufficient in capturing all of the severely wasted children (Dasgupta et al., 2013; Isanaka et al., 2015). Additionally, in one study those with a MUAC >11.5 cm but WHZ< -3 actually responded better to treatment than those with MUAC < 11.5cm (Isanaka et al., 2015). More research must be done on appropriate MUAC cut-offs to better capture those who are at risk and need treatment. Another area is understanding the overlap between risk factors for MAM, SAM, and stunting. When shared risk factors are identified and understood, policy makers can make policies that address the child holistically.

Organizational Strategies

The analysis of the nutrition strategies from organizations shows that the current strategies used agree with what the key informants are stating. The organizations are implementing the life-saving and high priority interventions cited in Bhutta et al (Bhutta et al., 2008).

Limitations

Some sentences during some of the interviews were hard to hear because of the recording or hard to understand, so the transcribed interviews may have some blanks in them and so not all words may be captured completely or could have been misinterpreted. However, this did not happen a lot so it should not affect the overall meaning of the data.

We selected specific countries to examine for this project; the context is really important to keep in mind when reading through the results.

CONCLUSION:

There are many interventions out there to address different issues. One of which is “wasting prevention”; the respondents understood that treating MAM to prevent SAM was a method and provided examples of interventions that address this.

Camps of emergency nutrition and developmental nutrition still exist. However, respondents identify the ultimate goal as helping children to survive and grow well. It is well recognized that multi-sectoral and harmonized approaches is the next step in this process. There are many obstacles in the way of achieving this including funding.

REFERENCES:

1. Global Nutrition Targets 2025 Policy Brief Series. (2014). WHO.
2. Global Nutrition Report 2017: Nourishing the SDGs. (2017). Global Nutrition Report.
3. Olofin, I., McDonald, C. M., Ezzati, M., Flaxman, S., Black, R. E., Fawzi, W. W., et al. (2013). Associations of suboptimal growth with all-cause and cause-specific mortality in children under five years: a pooled analysis of ten prospective studies. PLoS One, 8(5), e64636.
4. Lenters L, Wazny K, Bhutta ZA. Management of Severe and Moderate Acute Malnutrition in Children. In: Black RE, Laxminarayan R, Temmerman M, Walker N, editors. Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, Third Edition (Volume 2). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2016 Apr 5. Chapter 11.
5. Briend A, Khara T, Dolan C. (2015) Wasting and stunting--similarities and differences: policy and programmatic implications. Food Nutr Bull. 36 (1 Suppl): S15-S23.
6. Heidkamp R, in: Makrides M, Black R, Ong K, editors, Complementary feeding: Building the Foundations for Healthy Life. NNI Workshop Series (NNIW) Vol.87 , 2016
7. Lenters L, Wazny K, Webb P, Ahmed T, Bhutta Z. (2013) Treatment of severe and moderate acute malnutrition in low-and middle-income settings: systematic review, meta analysis and Delphi Process. BMC Public Health. (13): Suppl 3: S23-S38.
8. Lassi ZS, Das JK, Zahid G, Imdad A, Bhutta ZA. Impact of education and provision of complementary feeding on growth and morbidity in children less than 2 years of age in developing countries: a systematic review. BMC Public Health. 2013;13 Suppl 3:S13.

9. Ackatia-Armah, R. S., McDonald, C. M., Doumbia, S., Erhardt, J. G., Hamer, D. H., & Brown, K. H. (2015). Malian children with moderate acute malnutrition who are treated with lipid-based dietary supplements have greater weight gains and recovery rates than those treated with locally produced cereal-legume products: a community-based, cluster-randomized trial. Am J Clin Nutr, 101(3), 632-645.
10. NikiËma, L., Huybregts, L., Kolsteren, P., Lanou, H., Tiendrebeogo, S., Bouckaert, K., et al. (2014). Treating moderate acute malnutrition in first-line health services: an effectiveness cluster-randomized trial in Burkina Faso. Am J Clin Nutr, 100(1), 241-249.
11. Karakochuk, C., van den Briel, T., Stephens, D., & Zlotkin, S. (2012). Treatment of moderate acute malnutrition with ready-to-use supplementary food results in higher overall recovery rates compared with a corn-soya blend in children in southern Ethiopia: an operations research trial. Am J Clin Nutr, 96(4), 911-916.
12. Huynh, D. T., Estorninos, E., Capeding, R. Z., Oliver, J. S., Low, Y. L., & Rosales, F. J. (2015). Longitudinal growth and health outcomes in nutritionally at-risk children who received long-term nutritional intervention. J Hum Nutr Diet, 28(6), 623-635.
13. Uauy, R., Garmendia, M. L., & Corval·n, C. (2014). Addressing the double burden of malnutrition with a common agenda. Nestle Nutr Inst Workshop Ser, 78, 39-52.
14. Bhutta, Z. A., Ahmed, T., Black, R. E., Cousens, S., Dewey, K., Giugliani, E., et al. (2008). What works? Interventions for maternal and child undernutrition and survival. Lancet, 371(9610), 417-440.
15. Dasgupta, R., Sinha, D., Jain, S. K., & Prasad, V. (2013). Screening for SAM in the community: is MUAC a simple tool? Indian Pediatr, 50(1), 154-155.
16. Isanaka, S., Guesdon, B., Labar, A. S., Hanson, K., Langendorf, C., & Grais, R. F. (2015). Comparison of Clinical Characteristics and Treatment Outcomes of Children Selected for Treatment of Severe Acute Malnutrition Using Mid Upper Arm Circumference and/or Weight-for-Height Z-Score. PLoS One, 10(9), e0137606.

APPENDIX

Guide 1: Nutrition program planners within government and non-government institutions –

Country level

Purpose	Question
To understand the interviewees role and engagement with policy formation or program planning for nutrition	To start off as background, we would like to know your role in policy formation and/or program planning for nutrition. 0. Can you please tell me what your specific job title is, how long you've served in the position, and any role or roles that you play in nutrition policy formation and/or program planning for nutrition
To understand the range of interventions and programs that organizations deliver to address child nutrition	1a. First, please broadly describe your organization's portfolio of interventions and programs that address growth faltering in children under 5. By growth faltering we mean poor weight and/or length gain as measured with changes in weight, height &/or MUAC. 1b. Which of these more specifically involve the provision of food or supplement containing macronutrients? 1c. Which involve nutrition education* to improve dietary intake? Prompt/clarification: By nutrition education, we include broadly interpersonal counseling; group education with or without demonstrations; mass media, etc.

To understand through implicit analysis how nutrition planners and implementers describe and categorize nutrition interventions.	2. If you had to categorize or classify these interventions [repeat list] into groups, what terms or characteristics do (or would) you (or your institution) use? Prompt: A category could relate to what the interventions provide, who is targeted, who delivers the intervention, what it aims to impact or any other characteristic that you find meaningful.
To document how nutrition planners and implementers describe and categorize nutrition interventions according to children's nutritional status	3a. [*If applicable:* You mentioned nutritional status of the child] What is the nutritional status of children who are targeted for each of these interventions? Prompt: e.g. do they have to meet specific cut-offs?
To document how nutrition planners and implementers describe and categorize nutrition interventions according to children's age	3a. [*If applicable:* You mentioned the age the child] Which of these interventions are targeted specifically to sub groups within 6-59m age group? Prompt: Which are delivered only to children 6-23m olds?
To understand the types of programs/interventions that program planners and implementers associate with specific nutrition outcomes in children 6-59 months · poor linear growth – stunting · poor ponderal growth – wasting or acute malnutrition; · dietary intake	4a. [*If applicable:* You mentioned outcomes in the child] What nutritional outcome does each of these interventions aim to impact? Prompt: Make sure that the individuals address each of these outcomes: · linear growth: stunting · ponderal growth: wasting and/or acute malnutrition · general vs. specific dietary quality

To identify areas of potential overlap between stunting and acute malnutrition efforts from the perspective of nutrition planners/ implementers	4b. [NOTE: Ask this as a separate follow up question & document response separately] According to your understanding, which interventions will have impact on multiple outcomes? (e.g. stunting; wasting/acute malnutrition; dietary quality) 4c. Generally, in discussions and official documents (e.g. strategies, guidelines, policies and plans), to what extent are interventions associated with more than one outcome? Prompt - E.g., when you talk about the impact of intervention "x" is it intended to simultaneously impact both "stunting and wasting" or "diet quality and stunting" or is it usually focused on a single nutrition outcome.
To identify the terms and definitions used to describe acute malnutrition compared to wasting	5a. [*If applicable:* You mentioned acute malnutrition and/or wasting]. Do you consider wasting and acute malnutrition interchangeable terms for the same outcome? If not, how are these outcomes similar and different? Probe: What are the distinctions between moderate and severe forms of each of these conditions? 5b. In the contexts where you work, are these moderate vs. severe distinctions commonly applied when discussing outcomes a) for acute malnutrition? b) for wasting? 5c. Is the moderate vs. severe distinction made when discussing stunting? Probe: In what contexts is that distinction made? Probe: Is the moderate/severe stunting distinction uncommon, somewhat common, or very common?

To understand the relative importance that organizations place on wasting prevention versus other nutrition problems.	6a. [Building from previous questions] Does your country or institution implement or support interventions that you would identify as having a role in prevention of wasting? Which are these? 6b. [If applicable: you mentioned treatment of moderate acute malnutrition] What is the goal of moderate acute malnutrition programs? Probe: Why do you treat moderate acute malnutrition? What outcome does impact? 6c. Is the concept of "wasting prevention" commonly used in your context? Would it be understood? (If yes, who would understand this concept?) 6d. Given the diverse portfolio of interventions and initiatives in your country or context, how would you characterize the prioritization of wasting (or acute malnutrition) as an outcome relative to other nutrition problems? Probe: Specifically, how would you compare the prioritization of wasting to 1) stunting; 2) dietary intake/quality 6e. How does prevention of wasting more specifically compare in priority to other nutrition problems? 1) stunting; 2) dietary intake/quality
To understand the reasons behind the relative importance that organizations place on wasting prevention versus other nutrition problems.	7a. What factors contribute to the prioritization that you just described? 7b. Are there certain policy maker or program planning groups or audiences within your context who would give wasting or acute malnutrition higher priority compared to others?

To understand the perspectives of various national nutrition stakeholders regarding ideas for moving towards common typologies to deliver programs that impact stunting and wasting.	The primary aim of this research is to try to identify common ground between two groups operating at global level – the emergency nutrition community which has been more focused on treatment of acute malnutrition and the community that has been more focused on prevention of stunting. 8a. First off, do you feel that this division or distinction between types of programs and/or stakeholders is present in your context? 8b. [If yes], please describe some of the ways you see this distinction in your context. Probe: One what basis are they divided? For example, are different units responsible for different types of nutrition interventions? 8c. ([If yes] Is "prevention of wasting" a shared goal of these two communities. How is that evident? 8d. [If no to 8a] please explain why.

Guide 2: Nutrition program planners from multi-national institutions

Purpose	Question
To understand the interviewees role and engagement with policy formation or program planning for nutrition	To start off as background, we would like to know your role in policy formation and/or program planning for nutrition. 0. Can you please tell me what your specific job title is, how long you've served in the position, and any role or roles that you play in nutrition policy formation and/or program planning for nutrition

To understand the range of interventions and programs that organizations deliver to address child nutrition	1a. [If applicable, depending on the role of the participant] First, please broadly describe your organization's portfolio of interventions or programs that address growth faltering in children under 5. By growth faltering we mean poor weight and/or length gain as measured with changes in weight, height &/or MUAC. 1b. Which of these more specifically involve the provision of food or supplements containing macronutrients? 1c. Which involve nutrition education* to improve dietary intake? Prompt/clarification: By nutrition education, we include broadly interpersonal counseling; group education with or without demonstrations; mass media, etc.) 1d. In what major ways do the interventions that you just mention (in either category) vary by the country/region of implementation.
To understand through implicit analysis how nutrition planners and implementers describe and categorize nutrition interventions.	2. If you had to categorize or classify these interventions [repeat list] into groups, what terms or characteristics do (or would) you (or your organization/institution) use? Prompt: A category could be something like prevention vs. treatment. It could relate to what the interventions provide, who is targeted, who delivers the intervention, or any other characteristic that you find meaningful.
To document how nutrition planners and implementers describe and categorize nutrition interventions according to children's nutritional status	3a. [*If applicable:* You mentioned nutritional status of the child] What is the nutritional status of children who are targeted for each of these interventions? Prompt: e.g. do they have to meet certain cut-offs?

To document how nutrition planners and implementers describe and categorize nutrition interventions according to children's age	3a. [*If applicable:* You mentioned the age the child] Which of these interventions are targeted specifically to sub groups within 6-59m age group? Prompt: Which are delivered only to children 6-23m olds?
To understand the types of programs/interventions that program planners and implementers associate with specific nutrition outcomes in children 6-59 months · poor linear growth – stunting · poor ponderal growth – wasting or acute malnutrition; · dietary intake	4a. [*If applicable:* You mentioned outcomes in the child] What nutritional outcome does each of these interventions aim to impact? Prompt: Make sure that the individuals address each of these outcomes: · linear growth: stunting · ponderal growth: wasting and/or acute malnutrition · general vs. specific dietary quality
To identify areas of potential overlap between stunting and acute malnutrition efforts from the perspective of nutrition planners/ implementers	4b. [NOTE: Ask this as a separate follow up question & document response separately] According to your understanding, which interventions that your organization plans/delivers will have impact on multiple outcomes? (e.g. stunting; wasting/acute malnutrition; dietary quality) 4c. Generally, in discussions and outputs related to policy making and program planning in your focal settings (e.g. strategies, guidelines, policies and plans), to what extent are interventions explicitly associated with more than one outcome versus a single objective? Prompt - e.g. is the impact of a single intervention on stunting and/or wasting and/or dietary quality commonly discussed or is it usually focused on a single outcome?

To identify the terms and definitions used to describe acute malnutrition compared to wasting	5a. [*If applicable:* You mentioned acute malnutrition and/or wasting]. From your perspective, are wasting and acute malnutrition interchangeable terms for the same outcome? If not, how are these outcomes similar and different? Probe: Are moderate wasting and moderate acute malnutrition interchangeable terms for the same outcome? If not, how are these outcomes similar and different? Probe: Are severe wasting and severe acute malnutrition interchangeable terms for the same outcome? If not, how are these outcomes similar and different? 5b. In the contexts where you work, are these moderate vs. severe distinctions commonly applied when discussing outcomes a) for acute malnutrition? b) for wasting? 5c. Is the moderate vs. severe distinction made when discussing stunting? Probe: In what contexts is that distinction made? Probe: Is the moderate/severe stunting distinction uncommon, somewhat common, or very common?

To understand the relative importance that organizations place on wasting prevention versus other nutrition problems.	6a. [building from previous questions] Does your country or institution implement or support interventions that you would identify as having a role in **prevention** of wasting? Which are these? 6b. [NEED TO SPECIFY QUESTION] To what extent do you/your organization conceptualize treatment of moderate acute malnutrition as prevention of severe acute malnutrition? 6c. Is the concept of "wasting prevention" commonly used in your context? Would it be understood? (8c, part 2: If yes, who would understand this concept?) 6d. Given the diverse portfolio of interventions and initiatives in your organization's portfolio, how would you characterize the prioritization of **wasting (or acute malnutrition)** as an outcome relative to other nutrition problems? Probe: Specifically, how would you compare the prioritization of wasting to 1) stunting; 2) and dietary intake/quality 6e. How does the specific **prevention** of wasting compare in priority to other nutrition problems? Specifically to: 1) stunting 2) and dietary intake/quality
To understand the reasons behind the relative importance that organizations place on wasting prevention versus other nutrition problems.	7a. What factors contribute to the prioritization that you just described? 7b. Are there certain policy maker or program planning groups or audiences within your focal contexts who would give wasting or acute malnutrition higher priority compared to others?

To understand whether nutrition professionals perceive and describe "camps" as a problem to implementing policies and programs; and 2) to learn & how best to build harmonization and unity between these "camps" at the level of conceptualization of interventions. To understand how multi-national nutrition professionals experience or do not experience wasting/acute malnutrition/stunting dichotomies with country partners?	Our last set of questions will seek to learn about how you perceive the various "players" involved in implementing nutrition policies and programs and how well these groups interact to achieve shared goals of preventing growth faltering in children. Our goal for this section, and the overall study, is to identify strategies to build unity among the various intervention "camps" in terms of how they conceptualize approaches to address growth faltering. 8a. First off, do you feel that there is a division between any "camps" in the nutrition intervention community at your professional level? 8b. [If yes] What are these "camps" or communities? 8c. [If yes to 10a] One what basis are they divided? 8d. [If no to 10a] Within your context, what has allowed this lack of division? 8e. Do you feel that there is a division between any "camps" in the nutrition intervention community at the level of implementing partners who work at the country or community level? What factors do you think contribute to this division at the country level? 8g. [If yes to 8a] What ideas do you have for bringing these "camps" or communities together towards a shared goal of preventing growth faltering. 8g. [If yes to 10a] What avenues would you recommend for advocating for more harmonization in the various groups/"camps" that conceptualize nutrition interventions

Guide 3. Codebook

Code Name	Meaning
Intervention Types	The different intervention examples mentioned by respondents
Nutrition Education	Specific interventions that focus on nutrition education
Nutrition Supplementation	Specific interventions that focus on provision of food or food supplements
Categorization of Interventions	How interventions are categorized by respondent
Nutritional Status	References to how nutritional status affected targeting of an intervention
Child age	References to how age affected targeting of an intervention
Multiple outcomes	Description from respondent about how an intervention affects multiple nutrition outcomes
Wasting and Acute	Terms and definitions used to describe acute malnutrition compared to wasting
Importance MAM	Description of the relative importance that organizations place on wasting prevention versus other nutrition problems, including reasons
Wasting prevention recognition	Does respondent think the term is or would be recognized
Wasting prevention examples	Examples of interventions that address wasting prevention
Camps	Descriptions of any division between “camps”, and “players” in the nutrition community with regards to wasting, stunting, prevention, treatment, etc. Code will also include reasons for these divisions.
Harmonization	Ideas for building harmonization between camps/groups