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Beyond Stunting: Complementary Indicators for Monitoring and Evaluating USAID Nutrition Activities

MARCH 2021

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Photo Credit: A health worker measures a baby in Rwanda. Andrew Cunningham, JSI.

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Contents

Acronyms

ANC	antenatal care
ASF	animal source foods
BF	breastfeeding
BMI	body mass index
CHSF	community hygiene and sanitation facilitator
CHW	community health worker
DAG	disadvantaged group
DHS	Demographic and Health Survey
EBF	exclusive breastfeeding
EHA	Essential Hygiene Actions
EHFP	enhanced homestead food production
ENA	Essential Nutrition Actions
FCHV	female community health volunteer
FIES	Food Insecurity Experience Scale
FLW	frontline health workers
HF	health facility
HFOMC	Health Facility Operation and Management Committee
HFP	homestead food production
HH	household
HMIS	health management information system
ICYF	infant and young child feeding
IFA	iron-folic acid
LRP	local resource person
M&E	monitoring and evaluation
MDD	minimum dietary diversity
MICS	Multiple Indicator Cluster Survey
MIS	management information system
MIYCN	maternal, infant, and young child nutrition
MMS	multiple micronutrient supplementation
MTOT	master training-of-trainers
MUAC	mid-upper arm circumference
OFSP	orange-fleshed sweet potatoes
ORS	oral rehydration salts
OTP	Outpatient Therapeutic Feeding Program
PHC/ORC	primary health care outreach
PIP	Program Impact Pathway
RUTF	ready-to-use therapeutic foods

UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
WASH	water, sanitation, and hygiene
WHO	World Health Organization

Introduction

Two series published in *The Lancet* in 2008 and 2013 highlighted the association between stunting (very low height-for-age) and long-term adverse health and development outcomes (Victora et al. 2008). This evidence led nutrition programs to shift their emphasis from reducing underweight (very low weight-for-age)--a measure long associated with a high risk of mortality in previous (Pelletier et al. 1995; Schroeder and Brown 1994) and more recent (Myatt et al. 2018) literature--to reducing stunting. The prevalence of stunting has been used as an impact indicator for a wide range of nutrition interventions for over a decade.

However, recent literature has critically examined the use of stunting as an indicator for evaluating the impact of nutrition interventions. A review paper produced by the U.S. Agency for International Development (USAID) Advancing Nutrition project, *"Stunting: Considerations for Use as an Indicator in Nutrition Projects*," summarizes findings on the strengths and limitations of the prevalence of stunting as an indicator of programmatic impact, and suggests approaches for comprehensively and accurately measuring the results of nutrition programs.

This document has been developed as a companion to the review paper to support USAID nutrition programs, projects, and activities in selecting indicators, beyond stunting, that best fit a given program and can be used for monitoring and evaluation (M&E). This document summarizes the key findings from the stunting literature review, presents approaches for identifying additional indicators, and provides examples of illustrative indicators at various levels—output, short-term outcome, and long-term outcome—that are suitable for monitoring and evaluating selected nutrition-specific and nutrition-sensitive interventions.

Summary of Key Findings of the Literature Review on Stunting

The prevalence of stunting remains important as a population-level measure, reflecting **overall living conditions and welfare** (de Onis and Branca 2016). Stunting is also a useful metric to **track progress** within the same population over time, and to **identify sub-groups** within a population (or country) who are relatively more vulnerable due to inequalities. However, emerging evidence indicates a need to reexamine stunting as a primary indicator for the success or failure of nutrition interventions.

Stunting is a consequence of several factors that limit physical growth and general development, but it is not specific to undernutrition. On the other hand, inadequate dietary intake may result in adverse effects of nutrient deficiencies that are unrelated to stunting. Yet programs have focused excessively on improving dietary practices to prevent stunting, while frequently disregarding other underlying causes of stunting, such as environmental and social determinants (Leroy and Frongillo 2019). Moreover, reducing the prevalence of stunting takes time, and therefore is not appropriate to evaluate short-term (e.g., five-year) or single interventions.

Failure to demonstrate a reduction in stunting prevalence through an intervention does not equate to failure of an intervention. Conversely, a reduction in the prevalence of stunting is not always necessary to improve the well-being or nutritional status of children and, in some contexts, it is not sufficient to reach this goal (Leroy and Frongillo 2019). Overemphasis on reducing the prevalence of stunting may ignore other benefits produced by nutrition programs, and lead to deprioritization of certain types of nutrition interventions, which should not be dismissed. Thus, programs, projects,

and activities could measure stunting to assess long-term changes in general well-being to monitor progress within the same population over time and identify sub-groups within a population who are more vulnerable, if they are designed to influence such changes. Such programs, projects, and activities should also track indicators that measure outcomes in terms of the broader benefits—health, nutrition, and others—that they provide.

Selecting Indicators for Nutrition Programs

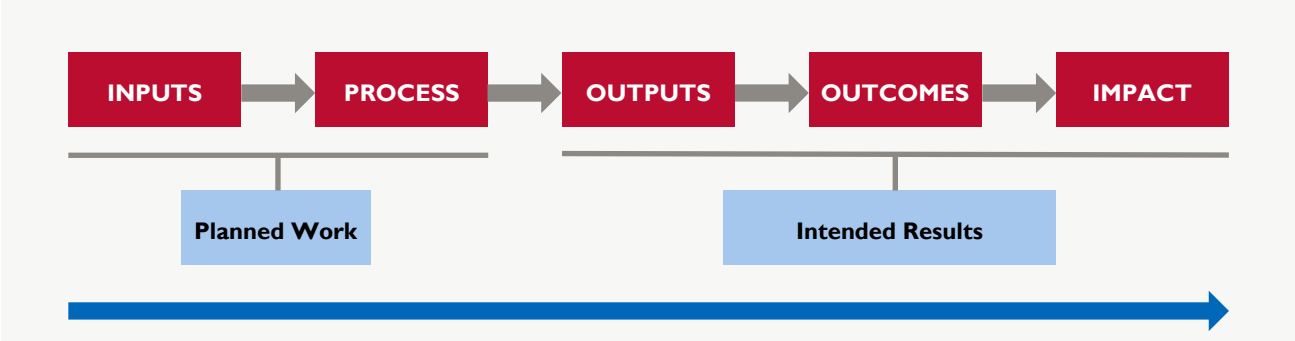
To measure program achievements, evaluators and program implementers should identify indicators that are more directly associated with the interventions being delivered and are measurable within program timelines. This means understanding how nutrition interventions are expected to benefit nutrition, health, and well-being, and measuring a broad range of the many benefits that nutrition programs can achieve. Nutrition programs could measure, for example, indicators such as diet quality, along with other indicators of child well-being.

1. Develop a logic model (or other framework) early in program development.

Beginning in the planning stage, implementers should lay out the theories and assumptions underlying a program, along with the plausible pathways through which the program will achieve impacts. Logic models illustrate the probable connections between program inputs and the desired outputs and outcomes, while accounting for factors that could influence program effectiveness (Frongillo 2017). For USAID activities, results frameworks included in requests for proposals and design documents serve this purpose; these should identify the result that activities could feasibly achieve within the implementation period, avoiding inclusion of results requiring longer-term implementation, or those that could be undermined by factors outside the program's control. A review of the literature, including past evaluations, is recommended at this stage and can aid in developing a logic model, including understanding the timelines for achieving results (Frongillo 2017).

One example of a logic model is a Program Impact Pathway (PIP), a systematic way to organize and present the relationship between planned activities and measurable results in a specific context (UNAIDS 2010). A PIP generally comprises a program's planned work (resources/inputs and activities) and its intended results (outputs, outcomes, and impact) (see Figure 1). Details on each element of a PIP appear after the figure.

Figure 1: Program Impact Pathway



Source: Frankel and Gage 2016

Resources/inputs: Identify the available resources for your program. This determines the extent to which a program's scope can realistically achieve the desired outputs and outcomes. Examples of inputs include staff, facilities, materials, and funds (Iskarpatyoti, Sutherland, and Reynolds 2017).

Process: Processes are the actions needed to implement the program and to achieve the program's objectives (Frankel and Gage 2016). The available resources/inputs are used in processes (sometimes referred to as activities) to produce the desired measurable results (i.e., outputs, outcomes, and impacts). Examples of processes are training, promotional activities, workshops, data collection, etc. (Iskarpatyoti, Sutherland, and Reynolds 2017).

Outputs: Outputs are the direct products or results of USAID activities (USAID 2018). They are not the changes the implementers expected to produce, but rather steps along the way to their intended results. ***They are usually expressed in terms of the program's scope, reach, and coverage***—whether the program was delivered to the intended audiences at the intended "dose." Outputs contribute to outcomes, but are not solely responsible for them. Examples of outputs include people trained, materials distributed, and volume of service delivery.

Outcomes: Outcome measures represent the actual changes that occur, or the difference a program makes on individuals, groups, families, organizations, systems, or communities that are directly related to the program's objectives.

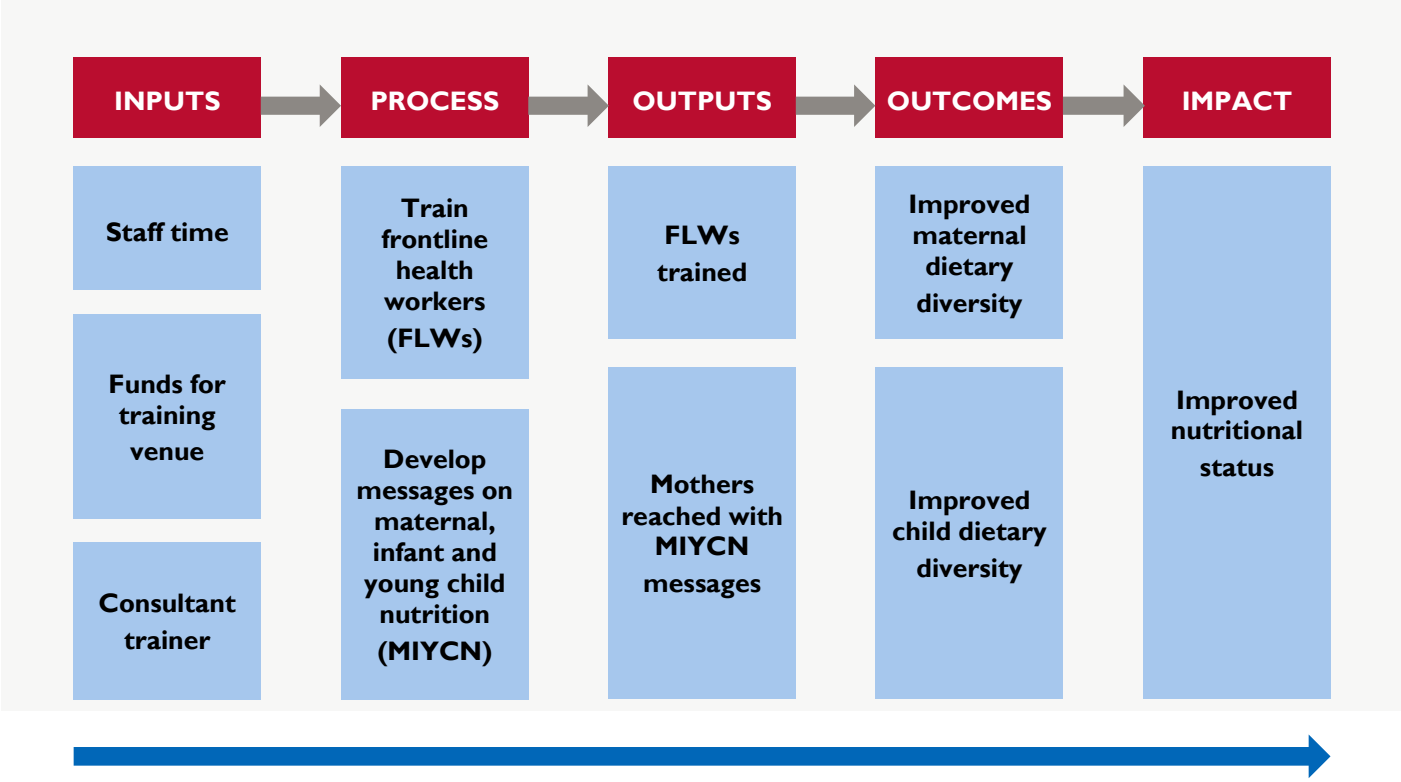
Short-term outcomes are the results the program aims to achieve after one to three years of program activity (Iskarpatyoti, Sutherland, and Reynolds 2017). They are specific changes in such things as people's attitudes, behaviors, knowledge, skills, or health status that result from program activities. Short-term outcomes are usually expressed at an individual level among program participants—for example, improved knowledge, changed opinion/values, increased skills, and changed motivation.

Long-term outcomes are results expected after four to six years (Iskarpatyoti, Sutherland, and Reynolds 2017). These outcomes include specific changes in attitudes or practices, usually building on the progress achieved through short-term outcomes. Examples of long-term outcomes include modified behavior, changed or improved practices, changes in health status, and changes in nutritional practices.

Impact: Impact refers to the population-level results achieved by a program, project, or activity after a long period of time—for example, seven to ten years (Iskarpatyoti, Sutherland, and Reynolds 2017). Some examples of impacts include changes in health and cognitive status, including physical growth. Longer-term outcomes or impacts, such as reduction of stunting or mortality, may be difficult to attribute to a single USAID program or activity. Usually, programs are not implemented in isolation, and their impacts result from improvements in multiple underlying factors. Furthermore, impact-level targets tend to be aspirational. USAID-funded activities contribute to impact along with activities from host-government, other donors, and unknown underlying factors. Hence, it is not always necessary nor recommended to have indicators at this level for assessing project/program achievements.

The simplistic PIP presented in Figure 2 is linear. However, in practice, a PIP includes multiple inputs from different activities. It is important to capture *all* the activities and outputs and map them to outcomes. Explicit recognition of these complexities can provide much-needed context to illuminate the relationships between a program's implementation and its expected impact. The PIPs for most programs, especially multi-sectoral nutrition programs, are complex (see Annex 1).

Figure 2: Simple Program Impact Pathway



2. Select indicators that will enable measurement across the entire program continuum.

M&E for projects and activities should include measurement of indicators directly associated with the interventions, as articulated in the logic model. Achieving programmatic impact often requires producing outputs that lead first to short- and long-term outcomes (such as improved access, increased knowledge, and improved service quality), which in turn contribute to impacts, such as stunting reduction or reduced mortality. Ideally, the indicators selected to monitor and evaluate USAID activities should reflect ***all elements along the pathway,*** from inputs to outputs to outcomes and to impacts, as appropriate. A major objective of M&E activities is to document what a project or activity has accomplished, but also to understand how well the program performed (i.e., process and output indicators). Even when evaluation designs are not rigorous enough to attribute outcomes to a project, measuring critical elements articulated in a logic model allows the results to plausibly link to the program.

Impact evaluations measure the changes that can be attributed to a program or activity. Frankel and Gage (2016) explain that impact evaluation is, "a set of procedures and methodological approaches that show how much of the observed change in intermediate or final outcomes, or 'impact,' can be *attributed to the program.*" Evaluations may choose to measure short- and long-term outcomes, rather than impact-level results, to determine "impact."

Annex I presents, as an example, the PIP for the first phase of the USAID-funded Suaahara program in Nepal, plus some of the indicators that were used to measure progress along the PIP.

3. Measure several types of outcomes.

Frongillo et al. (2014) recommend that the indicators used for evaluating programs should be able to provide suitable and useful information on the program's effects and the mechanisms by which the effect occurred. Measures of morbidity may include the presence of recent illness (Frongillo 2014). Many existing, validated tools exist that can be adapted and applied to measure food security at individual and household levels; for example, the Food Insecurity Experience Scale (FIES) (FAO 2016) and the Household Dietary Diversity Score (FAO 2008).

Recently, there has been increasing interest in measuring early childhood development, as it may provide valuable information to better understand benefits of nutrition programs. Tools such as the Ages and Stages Questionnaire and the Caregiver Reported Early Development Index can be adapted to assess a child's problem-solving, communication, socio-emotional, and fine and gross motor skills, as well as cognitive development (Fernald et al. 2017).

Complementing Monitoring of Stunting with Additional Indicators

Frongillo et al. (2014) emphasizes that the indicators should be valid, responsive to intervention inputs and activities, equivalent in constructs and items across contexts with appropriate adaptation, and feasible for use in effectiveness studies. The indicators described here aim to assess the success of programs at the different levels of the program impact pathway to better describe the effects of USAID programming investments.

Many indicators for nutrition-related outcomes, as well as non-nutrition outcomes that can be measured, along with nutrition outcomes, have been validated and adapted for different contexts.

Three nutrition-specific and four nutrition-sensitive interventions that USAID frequently supports were identified. To demonstrate how the different types of indicators (outputs, short-term outcomes, and long-term outcomes) can be applied to these seven interventions, illustrative indicators were identified for each intervention by level (Annex 2). All indicators presented are validated and have been applied previously. The tables in Annex 2 include the following information for each indicator:

- Type of indicator: This column refers to the element of the logic model the indicator measures.
- Definition: A definition of the indicator with numerator and denominator.
- What it measures: how to interpret the indicator, and what changes in this indicator suggest about the program or project.
- Advantage of the indicator: Advantages of using this indicator from the perspective of usability, ease of measurement, objectivity, and feasibility of collecting data on the indicator.
- Disadvantages of the indicator: Disadvantages of the indicator from the perspective of usability, issues with measurement, complexity, feasibility of collection, and acceptability to users.
- Broad factors influencing the indicator: Key factors (contextual, biological, or environmental) that are beyond the control of the interventions but likely to play a significant role in influencing the indicators.
- Recommended use (scenarios, interventions, timeframes): Indicates scenarios where the indicator can be used for comparisons across population and trends.

The longer-term outcome indicators associated with each intervention are meant to be used *instead* of stunting to evaluate interventions. These longer-term outcome indicators are a range of indicators

that measure changes in health status, behaviors, and practices. Many of these outcome indicators in the table are usually collected in large-scale, nationally representative surveys, such as the Demographic and Health Surveys; but this does not preclude their use in surveys intended to evaluate programs, projects, or activities in smaller geographic areas.

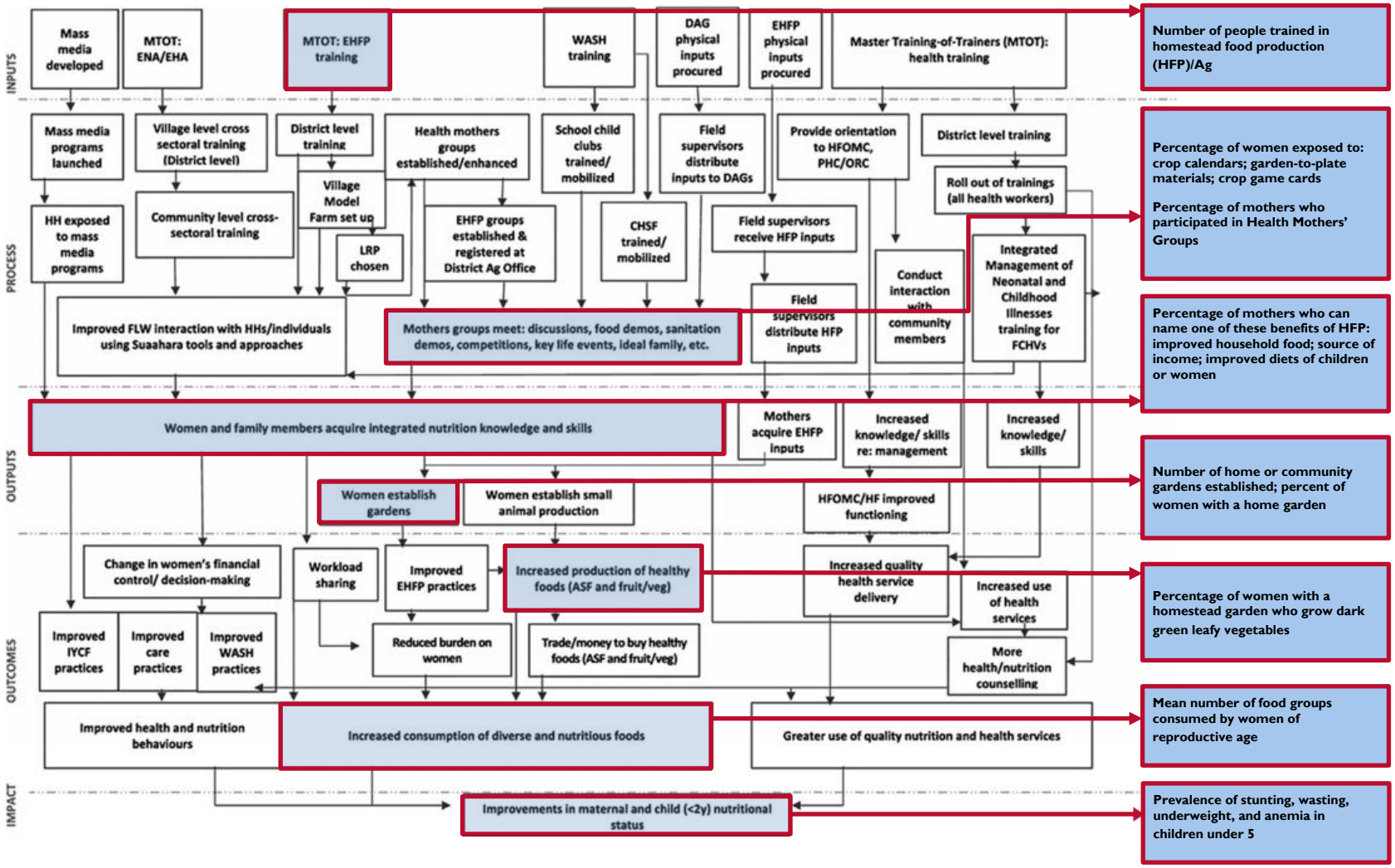
The illustrative indicators included in Annex 2 are not intended as an exhaustive or recommended set. Rather, they are *examples* of indicators that measure results that are more directly related to the outputs and outcomes expected of a broad set of nutrition interventions.

Measuring different types of indicators across the program's entire impact pathway helps us to understand how well programs are implemented and how results are achieved. Most important, measures like these allow us to learn about what the program has, or has not achieved, and why.

Conclusion

A singular focus on reducing the prevalence of stunting can result in misrepresentation of the potential impacts of programs, projects, and activities. At the same time, this singular focus can result in misinterpretation of the impact of nutrition programs. This does not suggest that stunting should not be measured at all; the companion review paper and Summary of Key Findings section above describes how it can be a useful indicator. Rather, this guide shows how accurate and meaningful results, beyond stunting, can be captured through the use of more comprehensive and responsive indicators that *directly* link to an activity's logical pathway. These indicators should be measured, as appropriate, for robust M&E. The indicators should be selected across the continuum of the program, including measuring the program's performance to understand and explain its short- and long-term outcomes. Measuring different types of indicators across the program's impact pathway helps to understand how well programs are implemented and how results are achieved. Most important, measures like these allow for learning about what the program has, or has not achieved, and why.

Annex 1. Suaahara I Program Impact Pathway Diagram and Select Project Indicators



Sources: International Food Policy Research Institute and Save the Children (U.S.) 2015; Choufani, Jamaluddine, and Cunningham 2019; Frongillo, Rajbhandhary, and Sagun 2021. *Suaahara I/II evaluated over 10-year programming period

Annex 2. Illustrative Indicators for Select Interventions

For eight nutrition interventions, illustrative indicators are categorized into three levels: output indicators, short-term outcome indicators, and long-term outcome indicators.

Type of indicator: This column refers to the element of the logic model the indicator measures.

Indicator: This column includes indicators that are either validated or commonly used.

Definition of the indicator: This column will provide a definition of the indicator with numerator and denominator.

What it measures: This column will provide information about how to interpret the indicator and what changes in this indicator suggest about the program or project.

Advantages of the indicator: This column indicates advantages of using this indicator from the perspective of usability, ease of measurement, objectivity, feasibility of collecting the indicator, and acceptability by the users.

Disadvantages of the indicator: This column indicates disadvantages of the indicator from perspective of usability, issues with measurement, complexity, feasibility of collection, and acceptability of the users.

Broad factors influencing the indicators: This column includes example of key factors (contextual, biological, or environmental) that are beyond the control of the interventions but likely to play significant role in influencing the indicators.

Recommended use: scenarios, interventions, timeframe to use the indicator: This column provides examples of programs or interventions where the indicator is appropriate to use. This also includes scenarios where the indicator can be used for comparisons across population and trends. "Timeframe" refers to short-term as a period of one to three years and "long-term" as more than three years.

Table 1. Iron and folic acid (IFA) or multiple micronutrient supplements (MMS) during Pregnancy

Type of Indicator	Indicator	Definition of the Indicator	What It Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Number of pregnant women who received the recommended number of IFA or MMS tablets at their first ANC visit	Count: Number of pregnant women who received the recommended number of IFA or MMS tablets at their first ANC visit. Note: The number of recommended IFA or MMS tablets may differ by the country's national ANC guideline.	Indicates programmatic reach of IFA or MMS among the pregnant women who are attending the health facilities for ANC services.	Straight forward to collect from the program monitoring system or routine HMIS system (if the country has this indicator in the HMIS system).	Does not measure the consumption. Does not measure the population level coverage as this is only among women attending ANC services. Restricting this indicator to tablets containing only IFA may not register all women who are receiving or purchasing iron supplementation or multiple micronutrient supplements.	This indicator may be influenced by the quality of monitoring/HMIS system. Stockouts of product (IFA or MMS) at the national, subnational, and health facility level.	The indicator can be collected routinely (quarterly) as part of a monitoring system.	WHO and UNICEF 2018; Hodgins and D'Agostino 2014
Short-term Outcome	Percentage of women who received/ purchase any IFA or MMS during their last pregnancy	Numerator: Number of pregnant women in the sample who received or purchased IFA or MMS tablets during last pregnancy. Denominator: Total number of pregnant women in the sample with a birth in the last (two, three, or) five years.	Indicates crude coverage of program/ intervention in the target population.	This indicator is widely available and straight forward to collect during HH surveys. Because intervention coverage changes more rapidly than nutritional status in response to policy and programmatic actions, routine monitoring of intervention coverage enables rapid assessment of progress and helps identify any need for mid-course corrections.	Questionable validity of self-reporting: recall bias and accuracy of reporting will be compromised, especially if a woman's last birth is farther in the past. Does not provide any information about number of tablets received or purchased nor compliance with the recommendations.	This indicator may be influenced by disruptions to supply chains and how easy it is to get the IFA or MMS tablets.	To assess adherence to the recommended IFA supplementation regimen. Surveys can be conducted every two years.	WHO and UNICEF 2018

Long-term Outcome	Percentage of women who consumed 90+ IFA or MMS tablets during their pregnancy	Numerator: Number of women with a birth in the (two, three or) five years preceding the survey who took IFA tablets or MMS for 90+ days Denominator: Number of women with a child born in the (two, three, or) five years preceding the survey. Note: The number of recommended IFA or MMS tablets may differ by the country's national ANC guideline.	Indicates adherence to the IFA or MMS recommendations during pregnancy	This indicator is widely available and straight forward to collect during HH surveys. This indicator goes beyond crude coverage and attempts to also capture adherence to recommend-ations.	Questionable validity of self-reporting: recall bias and accuracy of reporting will be compromised, especially if a woman's last birth is farther in the past.	This indicator may be influenced by disruptions to supply chains, and side effects experienced by women and their ability to manage them to ensure adherence.	To assess adherence to the recommended IFA or MMS supplementation regimen. Surveys can be conducted every two years.	adapted from WHO and UNICEF 2018

Table 2. Counseling for IYCF Including Exclusive Breastfeeding, Continuous Breastfeeding and Complementary Feeding

Type of Indicator	Indicator	Definition of the Indicator	What it Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Number of pregnant women attending ANC who received counseling on BF.	Count. Number of pregnant women attending ANC who received counseling on BF.	Indicates how well breastfeeding counseling is integrated within existing ANC services.	Straight forward to collect from the program monitoring system or routine HMIS system, review of health facility records, and/or ANC service exit interviews.	Does not measure the quality of counseling. Does not measure the population level coverage as this is only among women attending ANC services.	This indicator may be influenced by the quality of monitoring/ HMIS system and counseling capacity of the providers.	The indicator can be collected routinely (quarterly) as part of the monitoring system.	Haroon et al. 2013; Mallick, Benedict and Wang 2020
Short-term Outcome	Percentage of women who received counseling on breastfeeding during their last pregnancy.	Numerator: Number of pregnant women who received counseling on early initiation or exclusive BF. Denominator: Total number of pregnant women in the survey.	Indicates crude coverage of breastfeeding information dissemination in the target population.	Can be incorporated into any household surveys and/or ANC service monitoring data.	Additional information related to the counseling contact would be required to understand the impact of a specific program on the coverage of counseling; for example, the messages received during counseling, the type of provider or place where the counseling occurred, etc.	This indicator may be influenced by health workers' knowledge, counseling skills, demand for services that provide counseling, and women's access to and demand for health services.	Coverage breastfeeding counseling. If included as part of a monitoring system, this indicator can be collected frequently (quarterly, semi-annually, or annually), although denominators would be women who access ANC, well-child visits, or other existing services. Trend analysis can be used to examine progress and reflect programmatic outcomes over time.	Choufani et al. 2020

	Percentage of women with a child 0–6 months of age who received information/ counseling about exclusive breastfeeding from a health provider or community worker in the last 6 months	Numerator: Number of women with children 0–6 months of age who received counseling on EBF from health providers or CHWs. Denominator: Total number of women with children 0–6 months of age in the survey.	Indicates crude coverage of breastfeeding information dissemination in the target population.	Straight forward to collect from household surveys. Validated tools from various projects should be available for adaptation to a specific program.				Choufani et al. 2020
Long-term Outcome	Percentage of children 0–5 months exclusively breastfed.	Numerator: Infants 0–5 months of age who received only breast milk during the previous day. Denominator: Infants 0–5 months of age.	Indicates a "current status" estimation of exclusive breastfeeding based on recall of the previous day and includes living infants. The indicator is based on a cross section of children in a given age range; in this case, children from birth to just under 6 months of age. Does not represent the proportion of infants who are exclusively breastfed until just under 6 months of age and should not be	Sensitive to capturing changes over time. Recall error is low as the period of recall is 24 hours. Many countries now collect these indicators in their DHS and MICS surveys. Many interventions used these indicators and have been able to demonstrate impact in relatively short time frames (2–4 years).	Previous day recall period overestimates the indicator, as some infants who are given other liquids irregularly may not have received them in the day before the survey. Proportion of children who are exclusively breastfed until just under 6 months of age is lower than "current status" estimation of this indicator. Respondents' recall bias, especially if they are not the caregivers, and desirability bias can affect the accuracy of	This indicator may be influenced by maternal knowledge of breastfeeding, capacities for care, maternal mental health, and societal norm and practices. Quality of BF by health care providers.	To assess programs/ interventions on IYCF counseling and changes overtime through repeat surveys. IYCF indicators are intermediate and proximal level indicators and can be assessed in short-term period (e.g. 2–5 years).	WHO 2008); Imdad, Yakoob and Bhutta 2011; Greiner 2014; UNICEF et al. 2017

			interpreted as such. Can be further disaggregated and reported for the following age-groups: 0–1 months, 2–3 months, 4–5 months and 0–3 months.		measurement.			
	Percentage of children 6–23 months of age who attain minimum dietary diversity (MDD)	Numerator: Children 6–23 months of age who received foods from 5 or more food groups during the previous day. Denominator: Children 6–23 months of age.	Indicates the prevalence of IYCF practices recommended by the WHO. MDD was validated as a proxy of micronutrient intake as well as for food-group diversity. Recommended to disaggregate for the following age groups: 6–11 months, 12–17 months, and 18–23 months.	Sensitive to capturing changes over time. Recall error is low as the period of recall is 24 hours. Many countries now collect these indicators in their DHS and MICS surveys. Many interventions used these indicators and have been able to demonstrate impact in relatively short time frames (2–4 years).	Complex, measured from a series of questions, which should follow a certain flow. Although validated tools are available, they require some contextual and country-specific adaptation. Does not capture the quantity and/or quality of consumed food. Respondents' recall bias, especially if they are not the caregivers, and desirability bias can affect the accuracy of measurement.	This indicator may be influenced by maternal capacities for care, maternal mental health, seasonality, availability and affordability of food items, food security, and intra-household dynamics may all influence these behaviors.	To assess programs/ interventions on IYCF counseling and changes overtime through repeat surveys and comparing with baseline. IYCF indicators are intermediate and proximal level indicators and can be assessed in the short-term period.	WHO 2008 UNICEF et al. 2017

Table 3. Zinc Supplementation with Oral Rehydration Salts for Children with Diarrhea

Type of Indicator	Indicator	Definition of the Indicator	What it Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Percentage of HFs that experienced stock-outs of ORS and/or zinc in the last quarter	Numerator: Number of HFs that reported to have stock-outs of ORS and/or zinc. Denominator: total number of HFs.	Indicates availability of products is essential for ensuring proper treatment for diarrhea.	Straight forward to collect from program monitoring system or routine HMIS system, or from a review of HF records.	Does not measure length or extent of stockout.	This indicator may be influenced by the quality of program data collection system and reporting.	The indicator can be collected routinely (quarterly) as part of monitoring system.	
Short-term Outcome	Percentage of caretakers that have correct knowledge of treating childhood diarrhea with ORS and zinc	Numerator: Number of mothers/ caretakers of children 0–59 months who know about providing ORS and zinc for treatment of childhood diarrhea. Denominator: Number of mothers/ caretakers surveyed	Indicates exposure to and receipt of program messaging that are critical for adopting and/ or seeking correct treatment.	Straight forward to collect from household surveys. Validated tools from various projects should be available for adaption to a specific program.	The indicator is an indirect measure of program exposure and does not specifically indicate exposure to a particular program.	This indicator may be influenced by the socio-economic status, education background, or the religious or cultural beliefs held by mothers and caretakers' responsible for feeding children.	Can be collected frequently (annually).	Kung'u et al. 2015

Long-term Outcome	Percentage of children (under 59 months) who received zinc and ORS for an episode of diarrhea.	Numerator: Number of children who received zinc and ORS for an episode of diarrhea 2 weeks before survey. Denominator: Total number of children who had diarrhea in the 2 weeks prior to survey.	Measures adoption of recommended treatment practice for diarrhea in the population.	Relatively straight forward to collect in household survey. While two weeks recall is long, the caretakers are likely to remember whether ORS and zinc have been provided.	Can be affected by reporting and recall bias. Because this indicator is based on a sub-sample of children who were sick in the two weeks prior to data collection, in areas where the prevalence of diarrhea is low to medium, overall sample sizes may need be adjusted to capture enough sick children for the denominator.	This indicator may be influenced by stock-outs of zinc and ORS, and caretaker's knowledge about treating diarrhea with ORS and zinc.	Baseline and endline household surveys. Indicator can be compared across geographic regions.	Lamberti et al. 2015a; Lamberti et al. 2015b
	Percentage of children (under 59 months) diarrhea cases seen at health facilities who were treated with both zinc and ORS	Numerator: Number of diarrhea cases (under 59 months) who came to health facilities and received both zinc and ORS. Denominator: Total number of diarrhea cases in the age group who sought care at the health facility (disaggregated by public, private sectors, level of health facilities, etc.).	Indicates health facility level's adherence to treatment guidelines regarding childhood diarrhea.	Straight forward to collect from program monitoring system or routine HMIS system. Disaggregation by level of health system (regional, districts, health facility) can be useful for monitoring program performance. Trend analysis can be used to examine progress and reflect programmatic outcomes over time.	Needs established HMIS with reliable, complete and quality reporting of indicators.	This indicator may be influenced by stock-outs of zinc and ORS, and health care provider's knowledge about appropriate management of diarrhea.	Can also be applied for program performance monitoring. The indicator is useful for comparison across geographic regions.	Lamberti et al. 2015a

Table 4. Biofortification of Staple Crops (Example: orange-fleshed sweet potato)

Type of Indicator	Indicator	Definition of the Indicator	What it Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Number of households/ farmers enrolled in the OFSP program (disaggregated by sex).	Count.	Indicates if the program is able to reach the desired target to reach the desired outcome.	Straight forward to collect from program monitoring system.	This indicator does not address the skill of the farmers acquired through enrollment.	This indicator may be influenced by the quality of program data collection system and reporting.	Program monitoring: should be collected frequently (every quarter); trend analysis can be used to examine progress and reflect programmatic outcomes over time.	
Short-term Outcome	Percentage of farmers growing the biofortified crops (such as OFSP) Denominator: Total number of households/ farmers surveyed	Numerator: Number of farmers that are producing biofortified crops; Denominator: Total number of farmers surveyed.	Indicates adoption of one type of nutrition-sensitive agricultural practice. Increase adoption lies in the causal pathway between biofortification and improved nutrition status in the target population (such as vitamin A in children).	Straight forward to collect from household surveys. Validated tools from various projects should be available for adaptation to a specific program.	Does not indicate whether more land is being dedicated to production of biofortified staple crops nor whether the total production of biofortified crops (i.e., in weight) is increasing.	Availability of seeds for biofortified varieties, knowledge of farmers about how to best produce new varieties, and market level factors such as perceived demand and expected price for biofortified foods.	Repeat surveys to indicate changes in the adoption of practice.	de Brauw et al. 2018

Long-term Outcome	Mean vitamin A intake (retinol activity equivalent-RAE, µg/d) among the target population	Numerator: Sum of vitamin A intake measured in RAE, µg/d among all people surveyed. Denominator: Number of people surveyed.	Indicates total vitamin A intake from the dietary sources. The aim is to assess if consumption of OFSP has increased vitamin A intake among those exposed to the program.	Evidence-based indicator; a non-invasive and a quantitative 24-hour recall method to obtain detailed information on food intakes; energy and nutrient intake are measured using validated food composition table, consisting of published values for the country or region. Absent country or region-specific food composition tables, USDA maintains an extensive food composition table that could serve as a reference.	Recall bias as it requires a quantitative 24-hour recall of food consumed, availability of locally relevant food composition tables, and information about the levels of vitamin A in the biofortified foods introduced by the program. Advanced and complex survey statistical analyses.	This indicator may be influenced by an increase in vitamin A intake from sources other than OFSP; for example, fortified oil; demand creation efforts for OFSP; knowledge of benefit of the crop and vitamin A.	Intervention must take place for a minimum of 2 years for efficacy, which requires strengthening of agricultural adoption needed before conducting impact assessment.	Hotz et al. 2012; de Brauw et al. 2018; USDA n.d.

Table 5. Homestead Food Production

Type of Indicator	Indicator	Definition of the Indicator	What It Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Number of people trained in homestead food production activities and nutrition education (disaggregated by sex).	Count.	Indicates if the program is able to reach the desired target to reach the desired outcome.	Straight forward to collect from program monitoring system.	The indicator does not measure the quality of training, retention of knowledge, or quality of case management.	This indicator may be influenced by the quality of program data collection system and reporting.	Program monitoring: should be collected frequently (every quarter); trend analysis can be used to examine progress and reflect programmatic outcomes over time.	
Short-term Outcome	Percentage of households practicing homestead gardening	Numerator: Number of households that reported to have developed the recommended gardening practices. Denominator: Total number of households surveyed.	Indicates adoption of recommended practice of homestead gardening in the target population.	Straight forward to collect from household surveys. Validated tools from various projects should be available for adaptation to a specific program.	Does not indicate consumption or knowledge about nutrition.	This indicator may be influenced by household socioeconomic status.	Repeat surveys to indicate and changes in the adoption of practice.	Olney et al. 2009; SPRING 2018
	Percentage of households that own livestock (chickens, ducks, pigs, cows, etc.)	Numerator: Number of HHs that own livestock. Denominator: Total number of households surveyed.	Indicates adoption of recommended practice of livestock ownership in the target population.	Straight forward to collect from household surveys. Validated tools from various projects should be available for adaptation to a specific program.	Does not indicate consumption, income generation from the program, or knowledge about nutrition.	This indicator may be influenced by household socioeconomic status.	Repeat surveys to indicate and changes in the adoption of practice.	Olney et al. 2009

Long-term Outcome	Percentage of children consuming dark green leafy vegetables previous day	Numerator: Number of children (6–59 months) who consumed dark green leafy vegetables in the previous day. Denominator: Number of children (6–59 months) who were surveyed.	Indicates the consumption of single food groups or combinations of food groups, the availability of which could be promoted through homestead food production.	Dietary intake indicators have been validated in many countries using list-based or qualitative 24-hour recalls, which are easier to implement than quantitative 24-hour recalls and do not require food composition data or complex analyses. There are established manuals and modules on field questions and indicator measurement.	Contextual and country-specific adaptations to standard questionnaires are necessary. Mothers or caretakers' recall and desirability bias can also affect the measurement of these indicators. The way questions are asked, (e.g., open vs. closed recalls, number of foods listed in list-based recalls, etc.) will influence the measurement; care should be taken to ask these questions in exactly the same way over time to ensure comparability.	Many factors may influence these indicators, including seasonality, barriers to consumption of some foods, cultural or religious beliefs and taboos, intrahousehold allocation of resources, traditional care and feeding practices, and food preferences.	Intervention must take place for a minimum of 2 years for efficacy, which requires strengthening of agricultural adoption needed before conducting impact assessment.	Olney et al. 2009

	Percentage of children consuming eggs the previous day	Numerator: Number of children (6–59 months) who consumed eggs in the previous day. Denominator: Number of children (6–59 months) who were surveyed.	Indicates the consumption of single food groups or combinations of food groups, the availability of which could be promoted through a combination of social behavior change, homestead food production, cash transfers, vouchers, or other programs.	Dietary intake indicators have been validated in many countries using list-based or qualitative 24-hour recalls, which are easier to implement than quantitative 24-hour recalls and do not require food composition data nor complex analyses. There are established manuals and modules on field questions and indicator measurement.	Contextual and country-specific adaptations to standard questionnaires are necessary. Mothers or caretakers' recall and desirability bias can also affect the measurement of these indicators. The way questions are asked, (e.g., open vs. closed recalls, number of foods listed in list-based recalls, etc.) will influence the measurement; care should be taken to ask these questions in exactly the same way over time to ensure comparability.			Ruel and Alderman 2013
	Percentage of women consuming a diet of minimum diversity	Numerator: Number of women of reproductive age (15–49) who consumed a diet of minimum diversity (at least five of 10 specific food groups) during the previous day. Denominator: Number of women surveyed.	Indicates the consumption of a variety of food groups, the combination of which could be promoted through homestead food production.	Dietary intake indicators have been validated against other measures of micronutrient adequacy. There are established manuals and modules on field questions and indicator measurement.	Contextual and country-specific adaptations to standard food lists are necessary. Complex, measured from a series of questions, which should follow a certain flow. Does not capture the quantity and/or quality of consumed food.			FAO and FHI 360 2016

Table 6. Food Fortification

Type of Indicator	Indicator	Definition of the Indicator	What It Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Amount (volume) of fortified food produced at the national level	Volume.	Indicates production of fortified food.	Straight forward to collect from annual reports of fortified food programs.	The indicator does not measure if the product reached the target nor its true compliance.	This indicator may be influenced by the quality of program data collection system and reporting.	Program monitoring: should be collected frequently (every quarter); trend analysis can be used to examine progress and reflect programmatic outcomes over time.	GAIN and Oxford Policy Management 2019; Friesen et al. 2017
Short-term Outcome	Proportion of food vehicle brands that are fortified according to standards	Numerator: Number of food vehicle brands confirmed to be fortified according to the national standard. Denominator: Number of all available food vehicle brands.	Indicates the fortification compliance of branded food vehicles in the market	Sampling food brands available in the market is straight forward.	This indicator needs to be measured separately for each food vehicle-nutrient combination of interest. This requires laboratory capacity to analyze food samples.	Degradation of nutrients if food samples are not properly handled may result in underestimates.	Outcome monitoring: should be collected periodically (e.g., annually) to monitor availability and quality of fortified foods in the market.	GAIN and Oxford Policy Management 2019

Long-term Outcome	Proportion of households that consume a fortified food vehicle (HH level)	Numerator: Number of households consuming a food vehicle that is confirmed to be fortified (to any extent). Denominator: Number of surveyed households.	Indicates coverage of food vehicles that are included in the national fortification program. This indicator is constructed only for food vehicles that are included in the fortification program. If multiple nutrients are analyzed in a food vehicle, and there are cases where food vehicles contain only one of the nutrients, the data analyst will need to decide which nutrient to use as the marker to determine whether the household consumes a fortified vehicle and clearly state it in the indicator name.	Straight forward to collect from household surveys. There are many manuals available to measure food fortification such as GAIN's FACT Toolkit, USAID/A2Z, WHO, and the Food Fortification Initiative. It requires application of simple assays (kits, if possible) to determine the fortification compliance.	This indicator needs to be measured separately for each food vehicle of interest; does not measure the quantity consumed at the households.	This indicator may be influenced by the accuracy of identification of brands that are being fortified; quality of fortification at the mass level.	Coverage survey of fortified food at household level; short-term	GAIN and Oxford Policy Management 2019; Friesen et al. 2017

Table 7. Supplemental Nutrition Assistance

Type of Indicator	Indicator	Definition of the Indicator	What It Measures	Advantages of the Indicator	Disadvantages of the Indicator	Broad Factors Influencing the Indicators	Recommended Use: Scenarios, Interventions, Timeframe to Use the Indicator	Citations
Output	Number of nutritionally vulnerable individuals who receive specialized nutritious foods, cash, or vouchers intended to achieve a nutritional outcome	Count.	Indicates the number of people who are receiving services.	Straight forward to collect from routine monitoring systems.	Changes in this indicator may reflect fluctuations in the number of people in need of supplemental nutrition assistance and should be interpreted alongside other information about changes in vulnerability.	This indicator may be influenced by the quality of program data collection system and reporting, and depending on the modality, may be affected by disruptions in supply chains.	Program monitoring: should be collected frequently (e.g., monthly); trend analysis can be used to examine progress, identify disruptions to service delivery, and reflect program activity over time.	USAID 2020
Short-term Outcome	Percentage of nutritionally vulnerable individuals (i.e., infants, young children, and pregnant or lactating women) who received supplementary nutritional support	Numerator: Number of vulnerable individuals in the program area who received supplementary nutritional support, disaggregated by modality. Denominator: Total number of vulnerable individuals in the program area at risk.	Indicates coverage of targeted nutritional support to the vulnerable population.	Straight forward to collect from household surveys. Validated tools from various projects should be available for adaptation to a specific program.	Challenging to identify the target population (denominator); does not measure the adequacy of quantity of supplementation.	This indicator may be influenced by how well screening programs are implemented to identify individuals at risk of nutritional deficiencies.	Program monitoring: should be collected frequently (every quarter); short-term surveys.	adapted from Chaparro and Dewey 2010

Long-term Outcome	Incidence (and prevalence) of wasting among children 6–23 months	Numerator: Number of children with a MUAC (less than 115 mm) or weight-for-age z-score (less than -2) events in children 6–23 months. Denominator: child-month at risk.	Indicates the proportion of children who are newly identified as severely acutely malnourished in a given month (or other reference period). Prevalence: Proportion of children who are severely acutely malnourished in a given month (or other reference period).	Changes in this indicator have been attributed to supplemental nutrition assistance, even after short duration.	Calculating incidence requires more complex data collection systems and statistical analyses than prevalence.	This indicator may be influenced by coverage of supplemental support programs, how targeting is managed, sharing of food with other household members, the adequacy of the general ration, and seasonality.	Collecting incidence data requires close and complex monitoring systems.	Grellety et al. 2012

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