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FOOD AND NUTRITION  
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User's Guide to the CMAM  
Costing Tool: A Tool for Costing  
Community-Based Management of  
Acute Malnutrition at the National,  
Subnational, and District Levels

Version 1.1

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# Acronyms

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<b>CHW</b>	community health worker
<b>cm</b>	centimeter(s)
<b>CMAM</b>	community-based management of acute malnutrition
<b>CMV</b>	combined mineral and vitamin mix
<b>COW</b>	community outreach worker
<b>CSAS</b>	centric systematic area sampling
<b>DHS</b>	Demographic and Health Surveys
<b>FTE</b>	full-time equivalent
<b>g</b>	gram(s)
<b>HIV</b>	human immunodeficiency virus
<b>HQ</b>	headquarters
<b>IU</b>	international units
<b>IV</b>	intravenous
<b>kg</b>	kilogram(s)
<b>km</b>	kilometer(s)
<b>L</b>	liter(s)
<b>m<sup>2</sup></b>	square meter(s)
<b>m<sup>3</sup></b>	cubic meter(s)
<b>mg</b>	milligram(s)
<b>ml</b>	milliliter(s)
<b>mm</b>	millimeter(s)
<b>MAM</b>	moderate acute malnutrition
<b>MICS</b>	Multiple Indicator Cluster Survey
<b>MOH</b>	Ministry of Health
<b>MUAC</b>	mid-upper arm circumference
<b>NGO</b>	nongovernmental organization
<b>ReSoMal</b>	Rehydration Solution for Malnutrition
<b>RUTF</b>	ready-to-use therapeutic food
<b>SAM</b>	severe acute malnutrition
<b>SD</b>	standard deviation
<b>SQUEAC</b>	semi-quantitative evaluation of access and coverage
<b>WFH</b>	weight-for-height
<b>WHO</b>	World Health Organization

# Definitions

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<b>Area</b>	A term used in the CMAM Costing Tool to refer to a geographic space (e.g., district) comprising a set of Outpatient Care sites and their associated communities and an Inpatient Care site
<b>Cell</b>	Basic unit of a Microsoft Excel worksheet; the intersection between a row and a column
<b>Copy and paste</b>	A function in Excel that involves copying entries from one cell and placing them in another
<b>Cut and paste</b>	A function in Excel that involves removing entries from one cell and placing them in another
<b>Full-time equivalent</b>	A unit that represents one full-time employee
<b>Group-Area</b>	A term used in the CMAM Costing Tool to refer to a geographic space comprising several Areas
<b>Inpatient Care site</b>	A site for Inpatient Care management of SAM at a health facility with beds and 24-hour care (e.g., hospital) or in a temporary structure
<b>Outpatient Care site</b>	A site for Outpatient Care management of SAM at a health facility, a health outreach point, or a mobile extension from a health facility, or in a temporary structure
<b>Tab</b>	Label indicating an Excel worksheet's name
<b>User's Guide</b>	This document
<b>Tool</b>	The CMAM Costing Tool
<b>User</b>	The person using the CMAM Costing Tool
<b>Workbook</b>	An Excel document composed of one or more worksheets
<b>Worksheet</b>	An element in an Excel file denoted by a specific tab within a workbook

# Introduction

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This is the first version of the CMAM Costing Tool (version 1.0, February 2011). We expect to revise this version based on comments from those who have used the Tool and taking into account developments in community-based management of acute malnutrition (CMAM).

Feedback from users is welcome. Please email us at [fantamail@fhi360.org](mailto:fantamail@fhi360.org).

## The Purpose of the User's Guide

This document is a guide to the CMAM Costing Tool, a Microsoft Excel-based application designed to predict the inputs required to establish and maintain CMAM.

The User's Guide is addressed to the user of the Tool. Its purpose is to:

- Explain the scope and limitations of the Tool
- Outline how the different worksheets are related
- Identify which worksheets and cells require data from the user and explain how to obtain the correct values
- Describe the assumptions underlying the calculations
- Provide guidance on how to analyze the results

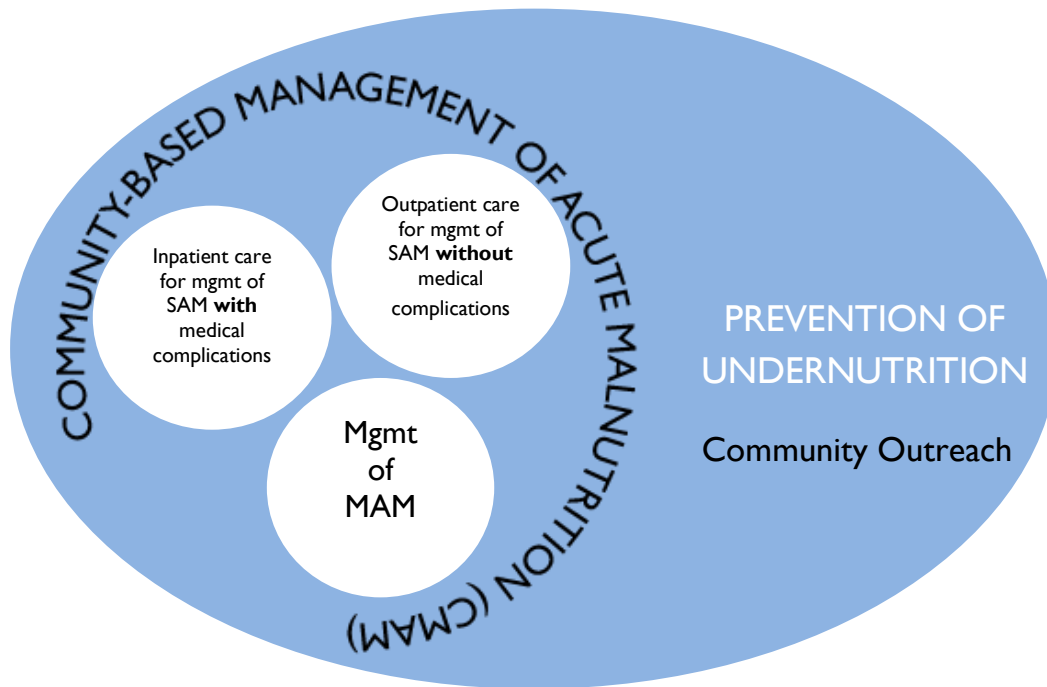
Read this User's Guide before attempting to use the Tool. In particular, consider the key assumptions adopted by the Tool, which are explained in Part 4. These assumptions will be changed if necessary.

## What Is Community-Based Management of Acute Malnutrition?

CMAM is an innovative approach for managing acute malnutrition in children within the community. CMAM results in early detection of cases of acute malnutrition, expanded access to treatment in decentralized sites, greater community involvement and support, and extended coverage. A comprehensive CMAM approach consists of community outreach, Outpatient Care management of severe acute malnutrition (SAM) without medical complications, Inpatient Care management of SAM with medical complications, and management of moderate acute malnutrition (MAM) (see **Figure 1**).

In the past, the only effective treatment for children with SAM involved Inpatient Care until full recovery, often in hospitals. This changed when a high nutrient and energy-dense, ready-to-use food was developed. This ready-to-use therapeutic food (RUTF) is resistant to microbial contamination and requires no preparation prior to consumption, making it suitable for home use. The availability of RUTF led to the design of CMAM, a public health approach for the management of SAM in children under 5.

Figure 1. Components of CMAM



SAM in a child 6–59 months can be identified in three different ways:

- **Mid-upper arm circumference (MUAC)** < 115 mm
- **Weight-for-height (WFH)** expressed as a z-score < -3 standard deviations (SDs) of the median according to the World Health Organization (WHO) 2006 Child Growth Standards
- **Detection of bilateral pitting edema**

CMAM involves two different modes of treatment for children with SAM.

- Children 6–59 months with SAM who have an appetite and no medical complications are admitted to Outpatient Care provided at a health facility to which they return each week for a period of about 2 months. Upon admission, children receive anthropometric and medical assessments, including an appetite test, whereupon a decision is taken (triage) for treatment in Inpatient Care or Outpatient Care. Medical and dietary treatment is started and initial advice on home care is provided to the caregiver. At each follow-on visit, the health care provider monitors the progress of the child and provides weekly rations of RUTF to eat at home. Outpatient Care is usually provided at a primary health care facility (the Outpatient Care site), but can also be provided at a mobile outreach post attached to a health facility. Inpatient Care is usually provided at a hospital (the Inpatient Care site), but it can also be provided at a primary health care facility with bed capacity and 24-hour care.
- Children 6–59 months with SAM who have poor appetite and/or medical complications are referred to Inpatient Care. Children under 6 months with acute malnutrition are always referred to Inpatient Care. Inpatient Care is provided at a health facility with bed capacity and 24-hour care, usually a hospital. Here the children are fed with specially formulated therapeutic milks (F-75 and F-100) and provided any necessary medical treatment. Once their medical complications or poor appetite resolve, they graduate to Outpatient



Care (unless they are under 6 months of age, in which case they remain in Inpatient Care until they are fully recovered, usually at least 2 months).

CMAM also has an important community outreach component. Community outreach workers (COWs) are people involved in community outreach for CMAM. They might be community health workers (CHWs), other health staff based at health facilities, or nongovernmental organization (NGO) staff with community outreach responsibilities. They might also be volunteers who are based in the community and not receiving a salary for the community outreach work they do. COWs mobilize communities, identify, and refer children with SAM for treatment, trace absentees and defaulters, and follow up on problem cases in the communities.

Treatment and outreach are the primary functions of CMAM, but they need to be backed up by essential administration and management activities: the ordering, transportation, and storage of supplies; the referral between CMAM components; the training and supervision of health care providers; and the budgeting, planning, monitoring, and evaluation of the Ministry of Health (MOH)-run service/NGO-managed program.

CMAM should also include the management of MAM, offering a basic health care package and a supplementary take-home ration, e.g., fortified blended cereal, lipid-based nutrient supplement.<sup>1</sup> The management of MAM is not addressed in the current version of the CMAM Costing Tool, which focuses on the management of SAM in children under 5. The costs of the management of MAM might be incorporated into future revisions of the Costing Tool once global guidelines on the management of MAM are completed.

## The Objective of the Tool

The Costing Tool calculates the resources required to introduce, maintain, or expand CMAM in a country. This information helps managers decide whether their plans for CMAM are financially feasible and helps them formulate an effective implementation plan. The Costing Tool has a number of features designed to encourage good planning for CMAM. It:

- Spells out the elements of a well-designed CMAM service/program
- Adopts a comprehensive approach and automatically calculates the cost of *all* the components of CMAM, helping ensure that users do not underbudget
- Presents the results in terms of “quantities of resources required” (e.g., hours of manpower, km of travel, m<sup>3</sup> or room-days of space) and not just money, emphasizing the importance of planning as well as budgeting
- Focuses on activities (rather than simply inputs) emphasizing what has to be *done* to get the service/program to work well rather than simply what has to be *bought*
- Presents the results in a variety of different ways, from highly disaggregated to very summarized; the user will find everything from the cost of a particular input used for a specified activity (e.g., per diems for training at Outpatient Care sites) in one Area to a single figure for the Central-level annual cost of CMAM

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<sup>1</sup> MAM is measured by MUAC  $\geq$  115 mm and  $<$  125 mm and/or WFH expressed as a z-score  $\geq$  -3 and  $<$  -2 SDs of the median according to the WHO 2006 Child Growth Standards.

- Uses a computerized spreadsheet structure that makes it easy to explore the resource consequences of different scenarios, particularly different sizes of programs

## Whom the Tool Is for

Any MOH or NGO in a country or region of a country where acute malnutrition is a problem should consider implementing CMAM. Any health and nutrition agency considering starting or strengthening CMAM would benefit from using the CMAM Costing Tool.

The Costing Tool should prove most useful to individuals and organizations responsible for designing and financing CMAM, but might also have a role to play in promoting and managing CMAM.

The Costing Tool is designed principally for use at the Central level, though it is possible to focus on particular states, provinces, or regions, and even on a specific district or one or a group of CMAM sites (see **Appendix 1**).

## How the Tool Works

The Costing Tool is essentially a set of linked Excel spreadsheets. The user enters key country-specific data, such as statistics on malnutrition, distances between key administration facilities, and the prices of goods. The Costing Tool automatically processes these (and other data fixed by the Costing Tool) to calculate resource requirements and costs of CMAM for a geographic region and time defined by the user. Costs are calculated from the quantity of resources (number of units) and the price per unit.

The Costing Tool is quite simple to use, and it should be possible to do at least a preliminary application of the Costing Tool within a day.

- **There is no need to make any calculations.** All the user needs to do is input key data; the Costing Tool does the rest automatically.
- **The amount of data required from the user is modest.** Although the Costing Tool draws on more than 150 pieces of raw data, most of this is defined in the Costing Tool itself and set as default values. The demands on the user are relatively modest.
- **It is not necessary to have precise estimates of all variables before using the Costing Tool.** Because of the ease with which results are generated once data are entered (at the click of a button... and recalculated just as quickly), users are encouraged to “play” with the data they have, using best estimates (even guesstimates) if firm figures for some variables are not at hand. These preliminary results can be readily updated once more accurate data become available.
- **The Costing Tool is transparent and easy to follow.** Color-coding highlights where inputs from the user are expected, and indicates how other values are derived. Key calculation steps are spelled out, making it easy to trace how the numbers are generated. A common source is used for variables shared by different worksheets.

## Structure of the User's Guide

This User's Guide has five parts.

- **Part 1. What the Costing Tool is Costing Out** looks at the nature of the variability in CMAM services/programs (and how the Costing Tool deals with this) and identifies the essential elements in any CMAM service/program and how they can usefully be disaggregated.
- **Part 2. Key Features of the Costing Tool** outlines the structure of the Costing Tool and explains in general terms how it works.
- **Part 3. Data Entry Worksheets (D1 to D9)** describes for each worksheet the nature of the data the user needs to enter and suggests possible sources for those data or ways to derive them.
- **Part 4. Results Worksheets (R1 to R14)** explains for each worksheet the nature of the results generated and the assumptions underlying the calculations. Read these before using the Costing Tool to see if there are any that you wish to change.
- **Part 5. Interpreting the Results** provides suggestions on how to analyze the results.

# Part 1. What the Costing Tool Is Costing Out

## Variability and Standardization in CMAM

Underlying the development of the Costing Tool is an assumption that it is possible to talk about some kind of *standards* in the approach to CMAM. These standards are captured in the data and algorithms fixed by the Costing Tool (e.g., the amount of RUTF required to treat a child with SAM and the number of days required to train health care providers in Outpatient Care) and are derived from CMAM implementation experience to-date.

Yet CMAM can come in many different shapes and sizes, from small projects implemented by NGOs as a short-term response to an emergency situation to nationwide government services/programs addressing an ongoing acute malnutrition problem; from initial planning stages to a well-established service/program; from an independent, vertical project to one integrated into the existing health system; from a service implemented in a dense urban environment in a country with well-established infrastructure to one functioning in a highly decentralized rural area with few health facilities. Clearly, this variation has implications for costs. The Costing Tool addresses this diversity of scenarios in a number of ways.

- Most of the variation is captured in those variables for which the user is invited to enter country-specific data, most importantly data on prices, size, and newness of the service/program and distances between sites.
- Some of the variation is addressed at the stage of analyzing the results. For example, this is the point at which different degrees of integration can be taken into account.
- Some of the potential variation is dealt with by being excluded. For example, the Costing Tool does not deal with the costs of the management of MAM, which is sometimes part of a CMAM service/program.
- Finally, although set as defaults, the so-called “fixed” data in the Costing Tool can, if necessary, be modified by the user, allowing for more flexibility in the design of a service/program.

## Dimensions

Whatever the precise nature of the CMAM service/program being studied, it functions in a number of different dimensions:

- In various geographical locations
- Over several years
- Involving a variety of activities
- Occurring at different hierarchical levels in the politico-administrative structure

- Employing a number of different kinds of inputs
- Using financing from different sources

The Costing Tool allows the user to be selective in terms of where and when the CMAM service/program is being planned, i.e., the location and time period for which the cost results will be generated. However, for activities, hierarchical levels, and inputs, the Costing Tool is always comprehensive. It calculates *all* the resources required to carry out *all* the activities involved at each hierarchical level in implementing CMAM in a defined area and time.<sup>2</sup> The Costing Tool discourages the user from overlooking any components by requiring the user to first input all the data before generating any results, making it difficult to ignore particular inputs or activities.<sup>3</sup>

The Costing Tool does not make any assumptions about who is paying for what. This is a question the user is encouraged to consider *after* results are generated by the Costing Tool.

## Activities

Many varied activities must be undertaken for a service/program such as CMAM to work effectively. One convenient way to group them is into categories that share a common purpose. The Costing Tool uses the following categories to group the activity-based cost centers (“Activities”):

- **Treatment** (or case management) of children with SAM (on either an inpatient and outpatient basis)
- **Community outreach** in support of the management of SAM
- **Supply logistics** (transportation and storage of supplies, especially of RUTF and other therapeutic food)
- **Training** of health care providers and health managers
- **Supervision** of health care providers and health managers
- **Management** of the service/program (e.g., planning, budgeting, monitoring)

These categories are intended to be mutually exclusive and comprehensive, providing a home for all the activities undertaken as part of CMAM. “Activities” provide a useful structure for estimating and analyzing costs. Indeed, in the Costing Tool, the primary calculations of CMAM costs are done by considering each activity separately and identifying which actions and inputs are required to make it functional (see [Worksheets R6 to R14](#)).

## Hierarchical Levels

Another helpful way to think about a service/program such as CMAM and its costs is in terms of the location of its different activities. CMAM *services* are provided in three kinds of settings: the community, where children are screened and problem cases followed up on through home visits; Outpatient Care sites; and Inpatient Care sites.

<sup>2</sup> It does *not*, however, include the costs to beneficiaries to access the service.

<sup>3</sup> Although the final results are comprehensive, they are also disaggregated, which means that, once the whole cost picture has been produced by the Tool, it is quite straightforward to find out the cost and resource requirements for different activities and inputs.

These services are managed and supported by a network of administrative headquarters (HQ), usually within an existing health system structure. The HQ is responsible for organizing the provision of supplies, training and supervising health care providers, budgeting, planning, monitoring, and reporting. The Costing Tool assumes there are three levels in the administration hierarchy,<sup>4</sup> defined as:

- **Area** (in many countries equivalent to a “district”), which comprises a set of Outpatient Care sites and their associated communities, at least one Inpatient Care site, and an Area CMAM HQ
- **Group-Area** (common terms for which may be “province” or “state”), which comprises several Areas and its own Group-Area HQ for CMAM
- **Central** (i.e., the country or nation), which comprises several Group-Areas and its own Central HQ for CMAM

The Costing Tool calculates the costs of CMAM occurring at each type of site and at each of the three levels of administrative HQs for CMAM. Most of the Costing Tool’s worksheets are structured around the Area as the unit of analysis. Only one data worksheet (**D8**) and one results worksheet (**R6**) focus specifically on higher level (Group-Area and Central) costs.

## Inputs

Inputs are the raw materials from which activities and ultimately services/programs are created. The quantities of inputs used (together with the price of those inputs) are what directly determine costs. The cost of an activity is simply the combined cost of all the different inputs that are required to implement it. There are very many different inputs and a number of different ways that they can be grouped together. One convenient way used in the Costing Tool involves four broad categories:

- **Manpower** (e.g., labor, including health care providers, administrators, drivers)
- **Transport** (of supplies and people)<sup>5</sup>
- **Supplies** (materials, including therapeutic food and medical supplies)
- **Space** (for treatment, storage, and training)

The Costing Tool includes four results worksheets (**R1** to **R4**) that summarize the resource implications of CMAM for each of the main input categories. These worksheets derive their data from the material in **Worksheets R6** to **R14**.

## Time and Space

For time and space (unlike for the dimensions of activities, levels, and inputs), the Costing Tool does not require the user to be comprehensive. Although CMAM services/programs usually extend over a reasonably wide geographic area and continue for some years, the Costing Tool allows the user to be selective and choose

<sup>4</sup> Those countries with more than three hierarchical levels can use the Costing Tool by either ignoring one of their intermediate levels if its involvement in CMAM is small or by repeating the Costing Tool at the different levels.

<sup>5</sup> Transport is more accurately defined as an activity (requiring, as it does, a number of inputs, including fuel, a vehicle, and driver), but it is more convenient here to treat it as an input with a quantity (km) and a price.

for costing both the number of Areas (up to 10) and the period of time (up to 5 consecutive years).<sup>6</sup>

The Costing Tool assumes that most variables will remain unchanged over time and space, that some will vary from Area to Area (e.g., the epidemiology of SAM and population concentration), and that a few will also change over time.

The key variable likely to change over time is **the size of the service/program**. CMAM services/programs often start as small-scale efforts, perhaps a pilot project, and grow as new needs and/or resources are identified and experience is gained. The Costing Tool allows for various possibilities of growth, which are reflected in **Worksheet D2**, where the user can record different values for each Area and year for:

- The number of Outpatient Care sites
- The number of Inpatient Care sites
- The number of community outreach activity sites
- The number of SAM cases enrolled

**The intensity and nature of CMAM activities** will also change over time. Extra effort is required when CMAM is first introduced to a country; guidelines and training materials will need to be developed and logistical systems and policies designed. Similarly, at lower levels, Outpatient Care sites new to CMAM will require more intensive supervision and training. The Costing Tool handles this by distinguishing between the first and subsequent years and by assuming that training, supervision, and community outreach in sites and Areas and management in Areas, Group-Area, and Central HQ will be more intense where CMAM is new than where it is established. For example, the Costing Tool factors in additional time at the Central level to cover such activities as advocacy, guidelines, and curriculum development when budgeting for the first year CMAM is implemented.

**Price** is another factor likely to change with time, usually rising (inflation). The Costing Tool deals with this by expressing all prices as “constant” prices (see **Part 3**).

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<sup>6</sup> A separate run of the Tool is required for each year, but the raw data are entered only once.



# Part 2. Key Features of the Costing Tool

## Structure of the Costing Tool

Each of the Workbook's tabs is a separate worksheet, which is labeled at the bottom. The worksheets are named to assist the user in using the Tool.



The first three worksheets of the Workbook provide a table of contents, a brief explanation of what results the Costing Tool will show, and a short set of general instructions for filling out the worksheets.

**Worksheets D1 to D9** are used to enter data and alter assumptions that are used to calculate the costs.

Worksheets **R1 to R14** require no inputs from the user. **Worksheets R1 to R5** summarize the results in terms of *inputs*—manpower (**R1**), transport (**R2**), supplies (**R3**), and space (**R4**)—and *overall finances* (**R5**). Their figures are derived from calculations in **Worksheets R6 to R14**. **Worksheets R6 to R14** draw on the raw data in **Worksheets D1 to D9** to calculate the resource requirements and costs of CMAM *by activity*—management at the Area level (**R7**), treatment of children with SAM (**R8 to R10**), supply logistics (**R11**), training (**R12**), supervision (**R13**), and community outreach (**R14**). **Worksheet R6**—Central and Group-Area activities—is disaggregated by Group-Area rather than Area, and it covers more than one activity (in fact, all the activities that occur centrally: management, training, supervision, and logistics).

## Color-Coding of Cells and Symbols

To help the user understand how the Costing Tool calculates costs and to draw attention to the cells that require attention, some of the cells within the worksheets are color-coded and have a symbol next to them.

gold	... cells require data from the user. <b>These are the only cells that the user must fill in. These cells have a  symbol next to them.</b>
yellow	...cells in the Costing Tool that copy their values directly from values in the gold cells.
dark green	... cells contain values that the Costing Tool fixes in advance, i.e., universally applicable ones. <b>If the user determines that the values in these cells are not appropriate for his/her situation, the user can modify them. These cells have a  symbol next to them.</b>
light green	...cells in the Costing Tool that copy their values directly from values in the dark green cells.
purple	... cells containing algorithms (i.e., functions or equations) that automatically calculate results using data provided by the user (gold cells) and fixed values defined by the Costing Tool (dark green cells).
blue	... cells containing hyperlinks to other cells in the same or other worksheets.
red	...cells need attention. Built-in conditional formatting alerts the user to inconsistencies or errors.



## Cautions

**Clear data from previous applications of the Tool.** When you first open the Costing Tool to enter a new set of data, take the precaution of clearing any data that may have been entered in a previous application. Click on the “Clear” buttons at the top of each of **Worksheets D1 to D8**. (Do this either for all worksheets at once before entering any data or worksheet by worksheet). Do NOT clear data from the completed Tool if you plan to re-run it for another year. In this case, simply change the value of the year in **Worksheet D9**.

**Enter ALL the data requested by the Costing Tool that are relevant for the level of use.** Although it is possible to run the Costing Tool without completing all cells, the results might be difficult to interpret and might create errors. If there are particular activities or inputs of interest, it is best to focus on them in the analysis phase once the full results have been generated.

**Keep worksheets protected.** To prevent users from inadvertently erasing or modifying built-in algorithms or formatting, most of the cells in the worksheets are protected. (The exceptions are the gold-colored cells, in which the user is required to enter data.) If you must enter data in protected cells (e.g., to change one of the Tool's built-in default values), click on *Costing Tool Tab > Protection > Unprotect Sheet*,<sup>7</sup> but this should be done with extreme caution and the process should be reversed (i.e., reprotect the cells by clicking on *Tool Tab > Protection > “Protect Sheet”*<sup>8</sup>) as soon as you have made the changes.

**Do NOT use “cut and paste” or “copy and paste” in the Costing Tool.** Some of the data entry (gold) cells have validation or conditional formatting that alerts the user if a clearly inappropriate value has been entered. Other cells are formatted to help with presentation (e.g., some irrelevant cells are hidden). This formatting is unaffected by normal entry procedures. But if a cell is *pasted* into, it loses not only any existing values, but also the validation and conditional formatting.

**Do NOT directly alter any of the values in Worksheets R1 to R14.** All the values in these worksheets come from “master” cells in **Worksheets D1 to D9**. Only these master cells in **Worksheets D1 to D9** should be changed. This will automatically lead to appropriate changes throughout the Tool. Otherwise, inconsistencies likely emerge with some worksheets using one value for a given variable and other worksheets using a different value.

**Do not put text where numerical values are required.** This generates error messages.

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<sup>7</sup> In Excel 2007, click on *Review > Unprotect Sheet*.

<sup>8</sup> In Excel 2007, click on *Review > Protect Sheet*.

## Using the Tool: Six Easy Steps!

1. **Provide suitable values** for all the cells highlighted in gold in **Worksheets D1 to D8**. Consult **Part 3** of this User's Guide for additional information.
2. **Examine the assumptions** built into the Tool (default values in dark-green cells in **Worksheets D3 and D8**) and, if necessary, change them to evidence-based country assumptions (taking care to reprotect the worksheets). The key assumptions are discussed in **Part 4** of this User's Guide. Read these assumptions before attempting to use the Tool.
3. **Enter the data for the first year** you are budgeting for into **Worksheet D9**. The Costing Tool will automatically generate all the results for that year.
4. **Save a copy of the Workbook** using a file name that clearly indicates the year for which the results have been calculated (for example, "CMAM Costs, Haiti, 2010").
5. If you are budgeting for more than 1 year, **repeat Steps 3 and 4** and save the Workbook with a new file name that indicates the year for which the results have been calculated (for example, "CMAM Costs, Haiti, 2011"). Repeat this for each of the years for which you are budgeting.
6. For each of the years, **review the summary results** in **Worksheets R1 to R14**, printing them out if possible. Analyze the results using **Part 5** as a guide.

## Using the Tool at Different Levels

The Tool is designed for Central-level planners. However, it is possible for managers at lower levels (e.g., at the Group-Area, Area, or even Outpatient Care site level) to use this Tool, too. To do so most efficiently requires combining selectivity in data entry with selectivity in data analysis.

- **Define the scope appropriately.** An Area manager, for example, specifies a single Group-Area and Area (**D1**). An Outpatient Care site manager does the same and also identifies only one Outpatient Care site in **Worksheet D2**.
- **Be selective in data entry.** Some of the data the user is asked to provide in **Worksheets D3 to D7** is clearly level-specific (e.g., the salaries in **Worksheet D4**). There is no need to enter data for those variables that will clearly not be relevant. For example, an Area manager need not fill in the data related to distances between the Central and Group-Area levels or the salaries of Central- and Group-Area-level staff. But care should be taken in being too selective; it's better to err on the side of being more complete than absolutely necessary at the data entry stage.
- **Focus on relevant results worksheets (R1 to R14)** and parts thereof. Once the results are generated, the user can focus on those elements that are of interest. For example, an Area manager could ignore the costs identified as belonging to Group-Area and Central level in **Worksheets R1 to R6** completely.

The table in **Appendix 1** summarizes how managers at different levels could selectively use the Tool.

# Part 3. Data Entry Worksheets (D1 to D9)

**Worksheets D1 to D9** contain all the raw data from which the costs and resource requirements of CMAM are calculated:

- **Worksheet D1.** Background
- **Worksheet D2.** Scale
- **Worksheet D3.** Epidemiological, demographic, and service/program data
- **Worksheet D4.** Prices (excluding salaries and “fixed supplies”)
- **Worksheet D5.** Salaries
- **Worksheet D6.** Fixed supplies (for Outpatient Care and Inpatient Care sites)
- **Worksheet D7.** Frequency of therapeutic food deliveries
- **Worksheet D8.** Group-Area and Central-level statistics
- **Worksheet D9.** Time-dependent variables

The user enters data into the gold-colored cells in each of the worksheets. Instructions are given at the top of each worksheet with further details provided in the worksheet tables for some of the specific variables. More general comments on each of the worksheets are also provided in the following sections.

## General Procedures for Data Entry

Starting with **Worksheet D1**, read the relevant section in the User's Guide and then enter your data in the worksheet itself. Continue in the same fashion with **Worksheet D2**, **Worksheet D3**, **Worksheet D4**, etc., ending with entering data on **Worksheet D9**. It is important to work on the worksheets in numerical order because tables in **Worksheets D2 to D9** depend on data entered in previous worksheets. It is also important to provide values for all the gold-colored cells, even if these values are only estimates. The Tool *can* generate results without all the data cells being completed, but they might be misleading. Analyze the results only once all relevant data have been entered.

Some cells in some worksheets (in particular **Worksheets D3**, **D6**, and **D8**) have built-in default values set by the Tool (in dark green-colored cells). Users should examine these default values and consider carefully whether different country-specific data need to replace them.<sup>9</sup> It is easier to assess this by examining the assumptions in the context of the activity to which they apply (see **Part 4** for more information). The Tool assumes for some values that the user enters (gold-colored cells) and for all values set by the Tool (dark green-colored cells) that the value recorded for Area 1

<sup>9</sup> To change default values: remove protection (see **Part 2**), enter the preferred country-specific value, and reapply protection (see **Part 2**).

applies to other Areas. The user should assess if this assumption is valid and make changes to default settings in other Areas if appropriate. For example, the variable “percentage of SAM cases with medical complications” might vary from one Area to another if, for example, some Areas have a higher HIV prevalence or contain large towns to which medical complications are referred.

If an item does not appear anywhere in your service/program, record zero (0) for the relevant *quantity*. If the item does appear in your service/program, but you will not be paying for it, you may choose to put zero (0) under the relevant prices. Do this only if you know that you will not be paying for *any* of that item. If you are in doubt, it is best to record the price and later, in the analysis stage, take into account that you will not need to pay for it.

## Worksheet D1. Background

In **Worksheet D1**, the user records country-specific terms and features of CMAM that are being budgeted for. The Costing Tool automatically uses some of this information to generate appropriately sized and labeled tables for the rest of the worksheets. To avoid creating messy headings, keep these terms and labels to a reasonable length (ideally under eight characters).

Next, the worksheet asks for some basic financial information, including the type of price being used in the analysis. This is designed to ensure that the user is clear about which of three different, but legitimate, approaches to pricing they plan to use.

- **Financial price** is the amount of money actually paid for a good or service. The problem with financial pricing is that it gives a “0” value to items that are donated or shared and paid for by others. The danger is that this might discourage managers from thinking carefully about the total resource requirements for their service/program.
- **Economic price** reflects the full value cost to society of the good or service. It might be positive even when the financial cost is zero (e.g., donated goods). Economic prices are the ones to use when measuring overall costs and benefits of different services/programs. Rigorous economic pricing can involve some quite complex calculations.
- **Market price** is the value of the good or service (or an equivalent good or service) in the marketplace. It is often the same as or close to the economic price. If available, the market price should be used in the Tool. It is an easy price to identify, and it encourages the user to recognize the value of goods or services even if he or she does not need to pay for them.

The user is also asked to specify a “base year for prices.” This is simply the year whose prices will be used for all of the years for which costs are being estimated. It can be any year, but generally speaking, it is easiest to use either a relatively recent past year or the current year.

## Worksheet D2. Scale

In **Worksheet D2**, the user defines the scale of the planned CMAM service/program and how it will grow over time. Size is a major determinant of cost, and the numbers entered into this worksheet are crucial in determining the final results. Size is defined by three parameters:

1. The number of Areas<sup>10</sup> participating in CMAM (recorded in **Worksheet D1**)
2. The number of Outpatient Care sites, the number of Inpatient Care sites offering CMAM, and the number of communities involved in outreach activities in each area in each year
3. The number of children with SAM expected to enroll in each Area in each year

The first two parameters are determined by the user, who may decide to implement CMAM in all or only selected Areas and in all or only some of the potential care and outreach sites within those selected Areas. This is where the user has the opportunity to define the CMAM service/program as narrowly or broadly as he or she wishes—to focus on the whole country or only on one Outpatient Care site in a defined Area.

There are many factors to take into account in deciding on the size of the service/program, including budgetary constraints, the political climate, and the pros and cons of starting small before going to scale. It might be difficult to assess these, especially in relation to the more distant future. The user should use whatever values for service/program size seem to be reasonable. As soon as more certain figures for service/program size are available, they can be entered into the Tool. If all the other relevant data have already been entered, the Tool will automatically and immediately generate the new results.

Part of the uncertainty about how extensively and quickly a service/program can grow might stem from not knowing the costs of different sizes of CMAM service/program (and whether it is compatible with known budgetary constraints). This is a classic “chicken and egg” situation: The costs cannot be calculated without knowing the size, but the size cannot be agreed upon without knowing the costs! With the Tool, it is a simple matter of experimenting with different values for “number of Areas” and “number of sites” to see which generate costs compatible with known budgetary constraints.

The third parameter—number of children with SAM enrolling in CMAM—is not directly determined by the user. Neither is it straightforward to estimate. Not all countries have reliable data on the number of children with SAM in a given Area, not all such children seek treatment, and some children seeking treatment are not from the catchment area of a participating Area. **Appendix 2** offers some guidance on how to make reasonable estimates of this important variable.

Unless budgeting for large numbers of Areas over several years, the user will not need to enter many figures into **Worksheet D2**. Indeed, a district manager interested in his or her first year's budget would only need to enter four figures. The Tool automatically adjusts the size of the table in **Worksheet D2** to reflect the values

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<sup>10</sup> For a definition of the key term “Area,” see the discussion in **Part 1**.

recorded by the user in **Worksheet D1** under “number of years being budgeted for,” “number of Areas to be budgeted for,” and number of active Group-Areas.”

## Worksheet D3. Epidemiological, Demographic, and Service/Program Data

In **Worksheet D3**, the user enters all of the non-price data that are expected to remain constant over time.<sup>11</sup> **Worksheet D3** is also used to record important default data provided by the Tool (in the dark green cells) that embody many of the technical assumptions about how quality CMAM services/programs function. Because of the large amount and variety of kinds of data in this worksheet, the user should refer to the detailed instructions provided in the body of the worksheet next to each specific variable and to **Part 4** of this guide, where the specific default assumptions for each activity are described in more detail. **Table 1** identifies which section of **Part 4** describes the assumptions embodied in **Worksheet D3**.

**Table 1. Where Assumptions in Worksheet D3 are Discussed in Part 4**

Assumptions in Worksheet D3 (rows)	Discussed in the following section of Part 4	
39–63	<b>R8</b>	Treatment (manpower and space)
66–81	<b>R14</b>	Community outreach
83–104	<b>R9</b>	Treatment (medical supplies)
106–120	<b>R10</b>	Treatment (other supplies)
122–162	<b>R11</b>	Supply logistics (transport and storage)
164–184	<b>R12</b>	Training
186–198	<b>R13</b>	Supervision
200–212	<b>R7</b>	Area HQ management

## Worksheets D4, D5, and D6

**Worksheets D4, D5, and D6** all require data on prices from the user. This section addresses a few general points that relate to all three worksheets.

**Price variability.** Although prices generally increase over time with inflation, the Tool avoids the complexity this creates by taking the prices for a base year (specified by the user in **Worksheet D1**) and using these to calculate costs in all other years, too. If, say, the base year were 2010, then the costs for all years would be expressed as though the prices remained as they were in 2010.<sup>12</sup>

Prices can vary over space as well as time. For example, prices in rural areas might be higher than prices in urban areas. Since most CMAM supplies are probably purchased

<sup>11</sup> One variable for which the assumption of constancy over time might not be true is “average distance between Outpatient Care site and Area HQ.” If, for example, CMAM expands by adding increasingly more recent Outpatient Care sites, average distance will clearly increase over time. If this effect is significant, the user may decide to enter different figures each time a different budget year is selected.

<sup>12</sup> “Real” costs can be converted into so-called “current” or nominal costs (i.e., expressed in prices of the year in which costs are incurred) by applying the average inflation rate (modified for those items expected to increase significantly more or less rapidly than average inflation). For example, say a service cost US\$2,000 in 2010 (in 2010 prices) and required the same level of resources the next year (when inflation was running at 10%). The cost of the 2011 service would be US\$2,000 in “constant” 2010 prices, but US\$2,200 in “nominal” 2011 prices.



centrally, these differences are unlikely to be important. The Tool assumes prices are the same throughout the country, but allows the user to change this default if desired.

**Sources of price information.** Most goods or services have a price that can be determined either from the commercial sector (domestic or international) or from government, especially the MOH's finance or personnel section or the Ministry of Finance.

**The units the prices refer to.** It is important to be precise about the nature of the good being priced and about the unit the price refers to (e.g., km, kg, boxes, m<sup>3</sup>).

**Purchase versus rental.** For most items, the purchase price is used to calculate costs. For a few, it might be more straightforward to use the rental or hiring price. This is the case for large capital goods, such as buildings and vehicles, whose useful life is significantly longer than 1 year. There are relatively few of these types of inputs in CMAM, and they tend to be shared with other programs. Thus, for costing purpose for CMAM, it is recommended to use a rental charge rather than a purchase price, as its service is rented from another service/program.

**Imports.** If goods are imported, the appropriate price to enter is the full cost of getting those goods into the country (including shipping, handling, customs, and insurance costs).

## Worksheet D4. Prices (Excluding Salaries and “Fixed Supplies”)

The user records in **Worksheet D4** the prices for most goods and services (except salaries [see **Worksheet D5**] and the so-called “fixed supplies” found in standard amounts in Outpatient Care sites and Inpatient Care sites [see **Worksheet D6**]).

**The price of goods** should reflect the cost at point of use. Most CMAM supplies are likely to be purchased centrally. The cost of distributing them to the point of use is handled in two ways in the Tool.

- For most CMAM supplies, the quantities required are assumed to be small enough to be accommodated in a general health delivery arrangement with negligible extra cost.
- For therapeutic foods (including RUTF), the volumes and weights involved are likely to be significant enough to require special arrangements. The Tool assumes that the price recorded by the user for therapeutic foods is the central purchase price (including shipping if the therapeutic food is imported) and calculates the cost of transportation to the destination from the number of km travelled to distribute the food and the transport price provided by the user.

**The price of transport** is not straightforward to estimate partly because transport is, strictly speaking, not one input but an activity with several inputs (e.g., fuel, oil, driver time). For the *transport of therapeutic food*, the user enters a price per km that reflects the cost of depreciation and maintenance and fuel (but not the cost of the driver, which is estimated separately). Vehicle maintenance workshops, government drivers, government finance offices, or hiring companies are potential sources of this information. If delivery is contracted out, the firm responsible can provide an estimate of the price per km. If this estimate includes driver costs, make adjustments to avoid double-counting.

The Tool also asks the user for the price of *transporting people* (for supervision and training mostly). This is even more difficult to generalize because of the variety of different modes of transport that might be used—anything from a bicycle to an airplane. To accommodate this, the Tool asks for several different prices: for trips originating from the community, Outpatient Care or Inpatient Care site, Area, Group-Area, or Central HQ for CMAM.

The user should identify the typical transport used at each level and determine a price that reflects the cost per person-km of that transport, i.e., the cost of 1 person to travel 1 km. This cost should cover fuel, maintenance, and driver. If this cost is estimated from fares (e.g., for bus, plane), it will be necessary to divide the fare by the length of the trip in km; if it is derived from costs per km for a vehicle, it will need to be divided by the number of people on average likely to share the vehicle.

**The final row in this worksheet** is different from the others. In it the user records not prices but broad differences in the general level of salaries between each Area and Area 1. (This is to allow a general correction to the average salaries recorded in **Worksheet D5**.) For example, if salary levels in Area 2 are similar to those in Area 1, a value of “1” would be recorded; if 15% more, “1.15”; if 25% less, “0.75”; and so on.

## Worksheet D5. Salaries

To help summarize the staffing implications of CMAM, the Costing Tool describes broad categories of staff at each level (e.g., “senior Area HQ staff”) and the functions they perform. The user identifies, for his country, specific types of health workers that fit each category and estimates their annual salaries for Area 1. How closely salaries in other Areas match these is recorded in **Worksheet D4**.

Trainers are sometimes given honoraria, which should be recorded in the worksheet.

Community outreach work is usually done by staff from the health system, but can be done by volunteers. In cases where volunteers are paid, the user has the opportunity to record this in the worksheet.

## Worksheet D6. Fixed Supplies for Outpatient Care and Inpatient Care Sites

A number of pieces of small equipment or routine supplies are required in relatively fixed amounts in each Outpatient Care site and Inpatient Care site. It is convenient to deal with these in a separate worksheet. **Worksheet D6** presents a list of recommended items and their quantities and expected length of life. The user needs to confirm that these recommended items and quantities are relevant to his or her circumstances and to add any additional items he or she considers appropriate. The Tool generates the pattern of resource use over time and calculates the cost for a new site and an average for established sites (based on expenditure over the next 5 years).

## Worksheet D7. Frequency of Therapeutic Food Deliveries

This worksheet requires the user to record the frequency of therapeutic food deliveries between each level from Central to Group-Area HQ (in the first table) and from



Group-Area HQ to Area HQ, and from Area HQ to Outpatient Care and Inpatient Care sites (in the second table).

Optimum delivery frequency will probably vary with the size of the service/program, but determining the optimum is not straightforward: Increasing the frequency of delivery increases the number of km travelled (and therefore transport costs), but it also means that vehicle size and storage requirements (and their costs) could fall. The Tool can be used to explore the consequences for costs of changing delivery frequency.

Choose what seems like reasonable figures for the frequency of deliveries. Examine the results and experiment with other feasible delivery schedules to see which combination produces the lowest cost. Note especially any warnings the Costing Tool might produce (see **Worksheet D9**, Rows 26, 27, 28 and 50-57), suggesting incompatibility with the figures you have chosen for the availability of storage or transport space.<sup>13</sup>

## Worksheet D8. Group-Area- and Central-Level Statistics

**Worksheet D8** collects in a single worksheet all the data<sup>14</sup> relevant to activities at those hierarchical levels above the Area, i.e., Group-Area and Central. The user completes data on distance and time, vehicles, and storage space and whether Group-Area trainees trained at the Central level are accommodated overnight or travel for training each day. The assumptions adopted by the Tool (the dark green-colored cells) are discussed in **Part 4** (Section R6. Central and Group-Area Activities).

## Worksheet D9. Time-Dependent Variables

**Worksheet D9** presents the key variables likely to change over time. These are variables that either the user has entered elsewhere in the workbook (e.g., numbers of Outpatient Care sites, Inpatient Care sites, and SAM cases in **Worksheet D2**; frequency of delivery of therapeutic food in **Worksheet D7**) or the Tool has automatically calculated from these (e.g., number of new and established Outpatient Care sites). The single value the user needs to enter into this worksheet is the year for which the Tool will run the analysis.

The Costing Tool generates results for 1 year at a time. Users interested in budgeting for more than 1 year (the Tool allows for up to 5 years to be budgeted for) need to rerun the analysis separately for each year. The Costing Tool is structured to make this a simple task. Once the basic data in **Worksheets D1 to D8** have been entered, the user simply enters into **Worksheet D9** the year for which he or she wants the analysis, and the Costing Tool automatically recalculates all the results for that particular year.

<sup>13</sup> The alert is provoked when the average size of one delivery of therapeutic food is larger than available space in the transporting vehicle or in storage at the destination.

<sup>14</sup> Except for the frequency of delivery of RUTF and other therapeutic food, which is recorded in **Worksheet D7**.

# Part 4. Results Worksheets (R1 to R14)

## Overview

This part of the User's Guide discusses the 14 results worksheets (**R1** to **R14**), describing for each the results and the key assumptions behind the calculations.

**Worksheets R1** to **R5** summarize the results for each main type of input and for overall finances. They draw their figures from results **Worksheets R6** to **R14**, which calculate the costs for each of the activity categories involved in CMAM. Activities at a higher level (Group-Area and Central) are summarized in **Worksheets R6** only.

**Worksheets R7** to **R14** refer to the Area level in the following way:

- Service/program **management** at Central HQ (**R7**)
- **Treatment** of children with SAM subdivided for convenience into manpower and space (**R8**), medicines (**R9**), non-medical supplies (**R10**)
- Supply **logistics** (**R11**)
- **Training** (**R12**)
- **Supervision** (**R13**)
- Community **outreach** (**R14**)

**Table 2** shows which inputs, activities, and levels are addressed by each of the results worksheets (**R1** to **R14**) and how together these worksheets generate a comprehensive picture of the resources used for different activities, different inputs, and different levels.

**Table 2. Which Results Worksheets Address Which Inputs and Activities**

		INPUTS					
		Manpower	Transport	Supplies	Space	Total	
ACTIVITIES	Area level and below	Community outreach				<b>R14</b>	
		Supervision				<b>R13</b>	
		Training				<b>R12</b>	
		Supply logistics				<b>R11</b>	
		Treatment (case management)	<b>R8</b>		<b>R9 &amp; R10</b>	<b>R8</b>	
		Management				<b>R7</b>	
	Group-Area level	Supply logistics				<b>R6</b>	
		Training					
		Management					
	<b>Total</b>		<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>	<b>R5</b>

**Worksheets R6 to R14** take raw data from **Worksheets D1 to D9** and use built-in algorithms to calculate resource requirements and costs. They contain all the Tool's cost calculations (which are shown below the results tables in each worksheet).

The Tool's assumptions (captured in the values in dark green-colored cells) about what each activity involves are discussed in the following sections. Having read these descriptions, the user might find there are some that are not relevant to his or her country's service/program and for which there are more accurate or appropriate figures. If so, the user should NOT make any changes to the results worksheet, but should instead identify where the value of that variable is first recorded (in **Worksheet D3, D6, or D8**) and make the changes there.

## **Worksheet R1. Annual Manpower Requirements for CMAM**

**Worksheet R1** summarizes the requirements for manpower (expressed as the amount of labor in full-time equivalents [FTEs]) across all activities involved in CMAM for all levels of operation. It is disaggregated by Area. The worksheet is constructed by pulling out the manpower elements from each of the different activity worksheets (**R6 to R14**).

## **Worksheet R2. Annual Transport Requirements for CMAM**

**Worksheet R2** summarizes the transport requirements (expressed in numbers of km and person-km) across all activities involved in CMAM for all levels of operation. It is disaggregated by Area. The worksheet is constructed by pulling out the transport elements from each of the different activity worksheets (**R6 to R14**).

## **Worksheet R3. Annual Supply Requirements for CMAM**

**Worksheet R3** summarizes the requirements for supplies (expressed in physical quantities) across all activities involved in CMAM for all levels of operation. It is disaggregated by Area. The worksheet is constructed by pulling out the supply elements from each of the different activity worksheets (**R6 to R14**).

## **Worksheet R4. Annual Space Requirements for CMAM**

**Worksheet R4** summarizes the requirements for space (expressed in m<sup>3</sup> and room-days) across all activities involved in CMAM for the levels of operation. It is disaggregated by Area. The worksheet is constructed by pulling out the space elements from each of the different activity worksheets (**R6 to R14**).

## **Worksheet R5. Financial Summary**

**Worksheet R5** summarizes the financial requirements for CMAM in a single table disaggregated broadly by type of activity and Area. The figures for this table are drawn directly from the calculations made in the activity worksheets (**R6 to R14**).

## Worksheet R6. Central and Group-Area Activities

(See [Worksheet D8](#), where assumptions, in dark green, are first recorded.)

Most of the worksheets in the Tool are structured around the unit of the Area. This allows for a reasonable degree of disaggregation, which improves the estimates of costs. But higher-level (Group-Area and Central) costs, mostly for activities loosely described as management, cannot easily be incorporated into this structure. They are, therefore, treated separately in [Worksheet R6](#), whose table is structured around Group-Areas. The following assumptions are incorporated into [Worksheet R6](#)'s model of the costs of higher-level activities.

### At the Central level:

- One mid-ranking health manager at the Central level spends 50% of his or her time on fixed management activities (i.e., activities that are little influenced by the number of Group-Areas participating). In addition, he or she spends 4 weeks helping set up CMAM in each new Group-Area and 1 week per established Group-Area in routine management, and conducts the training of Group-Area mid-ranking staff. He or she makes four visits to each new Group-Area HQ and one visit to each established Group-Area HQ.
- During the year CMAM is being established for the first time, one senior health manager and one mid-ranking health manager at the Central level work full-time to develop CMAM guidelines, job aids, training materials, curricula, and supervisory checklists; establish logistical systems and CMAM information systems; and interact with politicians and donors.

### At the Group-Area level:

- One senior Group-Area health manager and one mid-ranking Group-Area health manager spend 4 weeks setting up CMAM in each Group-Area new to CMAM (on advocacy, system development, and budgeting and planning).
- One mid-ranking Group-Area health manager spends 4 weeks for each Area new to CMAM and 1 week for each established Area on CMAM management (i.e., planning, budgeting, sorting out supply logistics, problem solving, monitoring, and reporting).
- Two mid-ranking health managers from each new Group-Area are trained in CMAM management for 10 days, and 2 health managers from each established Group-Area are trained for 2 days by a mid-ranking Central-level health manager in classes of no more than 10 participants.
- One mid-ranking Group-Area health manager provides training to Area-level health managers (5 days for staff from Area HQs new to CMAM and 1 day for staff from Areas where CMAM is already established).

## Worksheet R7. Area HQ Management of CMAM

(See [Worksheet D3](#), Rows 200–212, where assumptions, in dark green, are first recorded.)

Area HQ is responsible for a number of different CMAM activities, including supervision and training, but it is the general management functions that are captured in [Worksheet R7](#). (Area HQ involvement in training [as trainers or trainees] is included in [Worksheet R12](#); involvement in supervision is included in [Worksheet R13](#)). The following assumptions are incorporated in [Worksheet R7](#)'s model of the costs of Area-level management.

**To establish CMAM**, a new Area requires 4 weeks of senior and mid-level Area HQ health managers' time to assess the nutrition situation; develop a logical framework; conduct a situation analysis; and establish planning, budgeting, monitoring, reporting, and logistical systems.

**Managing CMAM** in new or established Areas (e.g., data collection and analysis, personnel and financial management) requires:

- One day per month of senior Area HQ health manager's time
- Two days per month of mid-level Area HQ health manager's time
- Five days per month of junior Area HQ health manager's time
- Half a day per month per Outpatient Care and Inpatient Care site of mid-level and junior Area HQ health managers' time
- Five days of a senior and mid-level Area HQ health managers' time per new Outpatient Care or Inpatient Care site to get the new sites up and running, travelling each day to the site

## Worksheets R8, R9, and R10

To allow for a reasonable degree of sophistication in estimating and presenting the cost of the management of SAM in children under 5 and without creating too complex a worksheet, the Tool disaggregates treatment costs into three elements in three separate worksheets: manpower and space ([R8](#)), medical supplies ([R9](#)), and other supplies ([R10](#)).

## Worksheet R8. Treatment (Manpower and Space)

(See [Worksheet D3](#), Rows 39–63, where assumptions, in dark green, are first recorded.)

CMAM involves health care providers carrying out a number of key activities related to the treatment of malnourished children: assessing and monitoring (weighing and medical assessment), registering, providing therapeutic food and medicines, testing appetite, giving health and nutrition education to caregivers, recording and analyzing data, and managing stocks and the premises. The following assumptions are incorporated in [Worksheet R8](#)'s model of the manpower costs of treatment.

### Treatment in Outpatient Care:

- Children 6–59 months with SAM attending an Outpatient Care session spend approximately 15 minutes of individual time with a senior health care provider to conduct the admission or monitoring procedures of anthropometry and medical assessment, treatment, and individual counseling. This is matched by the time of a junior staff member who assists in managing each child.
- For providing Outpatient Care, during the course of a day, a senior health care provider (accompanied by a junior health care provider) spends an hour completing registers, treatment cards, tally sheets, and monitoring reports and another hour preparing for the treatment, distributing RUTF and maintaining stock, and cleaning up.
- Each child enrolled in CMAM as an outpatient attends Outpatient Care sessions over a period of 8 weeks,<sup>15</sup> making visits to the Outpatient Care site every week.
- One senior health care provider and one junior health care provider spend 4 hours per week on data collection for monitoring and reporting.
- The space occupied by a child with SAM and his or her caregiver is 1 m<sup>2</sup> for 4 hours of the CMAM session.
- The space occupied by staff attending to SAM outpatients is 4 m<sup>2</sup>.

### Treatment in Inpatient Care:

- Children 6–59 months with SAM with poor appetite and/or medical complications are admitted to Inpatient Care and assumed to remain there for between 4 and 10 days before moving to Outpatient Care to continue treatment, where the procedures are as above. Children under 6 months of age remain as inpatients until full recovery (a process that usually takes between 1 and 3 months). Few children 6–59 months remain in Inpatient Care until full recovery.
- Each child with SAM with poor appetite and/or medical complications has an initial 1-hour clinical assessment upon arrival in Inpatient Care involving a senior and junior health care provider. This assessment is repeated each day (for half an hour) until discharge, when the clinical assessment also takes 1 hour.
- Therapeutic milk preparation, distribution, stock control, and cleanup take a junior health care provider 3 hours per day (20 minutes for each of 6–8 daily feeds of milk).
- A junior health care provider supervises the feeding of the children for 7 days (the usual inpatient treatment period), spending 15 minutes 8 times a day for each child for the first 3 days and 10 minutes 6 times a day for the remaining 4 days.
- A senior health care provider spends 2 hours 1 day per week reviewing and updating treatment cards and preparing monthly reports.

<sup>15</sup> This is the length of time considered adequate for most children to recuperate. It might be on the high side. The recent adoption of the WHO 2006 Child Growth Standards means that children with SAM are identified earlier and with less severe illness than had previously been the case. Furthermore, some children will drop out prematurely. If these effects are significant, the user needs to make appropriate adjustments.



- There is minimal staffing of 1 junior health care provider for 24 hours for any day during which there is at least 1 patient.
- The space occupied by a child with SAM and his or her caregiver is 7 m<sup>2</sup>, including the space of the adult bed itself and the Area around it.
- The space occupied by staff attending to SAM inpatients is 5 m<sup>2</sup>.

## Worksheet R9. Treatment (Medical Supplies)

(See [Worksheet D3](#), Rows 83–104, where assumptions, in dark green, are first recorded.)

Children with SAM who are enrolled in CMAM are treated routinely for underlying infections. The common ones are spelled out in [Worksheet R9](#), which calculates the amounts of drugs and medications routinely required using the following assumptions.

- **Amoxicillin** is the routine presumptive treatment of underlying infection given to all children with SAM, independent of their age, nutrition, or health status, in a dose of 60mg/kg/day. The Tool assumes an average of 5 days of treatment (i.e., on average, a total of 3 g per child).
- **Vitamin A** for all children over 6 months of age with SAM: 1 x 100,000 IU capsules for infants 6–11 months and 2 x 100,000 IU for children 12–59 months. The exception to this procedure is for children who have received vitamin A in the previous 6 months. Countries with good vitamin A coverage need to be careful of overdosing.
- **Measles vaccination** for all children over 6 months of age with SAM (1 dose at Week 4 for outpatients and 2 doses for inpatients—one when they are admitted and a second on discharge<sup>16</sup>). Since measles is highly communicable, case-fatality rates for children with SAM are high, and extra doses do not incur risks, all children should receive immunization unless routine vaccination services have complete coverage or vaccination is indicated on the child's health card.
- **Albendazole (or adjust for mebendazole)** for all children with SAM over 1 year of age: A single dose of 200 mg for children 12–23 months and 400 mg for children over 2 years. Exclude children who received albendazole the previous month. Treatment is provided only once either on the second Outpatient Care visit or in Inpatient Care in the second week before returning to Outpatient Care.
- Any child with **malaria** receives treatment. Malaria may be diagnosed either on the basis of symptoms alone or, if available, with the confirmation of diagnostic tests. Testing is not very sensitive in children with SAM (because of low parasite load) and might need to be repeated whenever the child shows symptoms of malaria. **In endemic areas, the choice is sometimes made to automatically provide malaria treatment to all children with SAM (presumptive treatment).**

<sup>16</sup> Because of the elevated risk of cross-infections for children with SAM in Inpatient Care, it is important to vaccinate for measles upon admission. However, it is unlikely that this vaccination achieves the correct level of immunity because of the immunologically depressed status of the child with SAM. Hence the need for a second vaccination on discharge.

- **Sugar water** available for whoever needs it to prevent hypoglycemia. Allow for approximately 100 ml per child attending treatment.
- Of those children referred for Inpatient Care, 20% are dehydrated and need **ReSoMal** (a specially modified oral rehydration solution for children with SAM), 10% require intravenous (IV) feeding and an **IV kit**, and 25% require **nasogastric tubes**.

## Worksheet R10. Treatment (Other Supplies)

(See [Worksheet D3](#), Rows 106–120, where assumptions, in dark green, are first recorded.)

Therapeutic food (especially RUTF) is a key ingredient of CMAM and one of the most costly. It is vital to estimate accurately the quantities required. The Costing Tool adopts the following assumptions.

- Twelve kg of RUTF is given to all children with SAM who do not require Inpatient Care.<sup>17</sup> Children with SAM with poor appetite and/or medical complications who are referred to Inpatient Care receive 2 kg of F-75 in their initial stabilization phase. Ninety-five percent of children requiring Inpatient Care are then given 12 kg of RUTF (1 kg while in Inpatient Care and 11 kg in Outpatient Care). Five percent of these children will not be able to eat RUTF and will remain in Inpatient Care until full recovery, receiving 12 kg of F-100 instead. These are estimates. The exact figures depend on such factors as the average bodyweight of the children with SAM and on whether enrolled children continue to participate or default.
- All infants under 6 months with SAM and 15% of children 6–59 months with SAM (the estimated percentage of children with SAM with poor appetite and/or medical complications) require Inpatient Care.
- Ten percent of the purchased RUTF, F-100, and F-75 is lost before distribution to the child (e.g., from pilfering or deterioration). In many countries, this might be an under- or over-estimate, especially for RUTF. The user should provide country-specific estimates if he or she has them.
- F-75 and F-100 can be prepared on-site, and RUTF, whether produced in-country or imported, needs to be stored. Users are given the opportunity to record the details (i.e., price, space occupied) of either the commercially available versions or those produced on-site or locally.

It is difficult to get a comprehensive estimate of the costs of Inpatient Care for children with SAM. The Costing Tool estimates some of the specific costs (e.g., essential equipment, therapeutic food, level of effort of health care providers), but other costs are more difficult to isolate (e.g., costs of providing beds and linen, cleaning wards, security). Some hospitals have their own estimates of the cost of a “bed-day,” the scope of which can vary from hospital to hospital. To enable the user to take advantage of these, the Tool derives an estimate of the number of bed-days associated with SAM treatment based on figures provided by the user for the length of stay of children hospitalized.

<sup>17</sup> A severely malnourished child treated as an outpatient should be given 150–220 kcal/kg bodyweight/day of RUTF, corresponding to approximately 30–40 g/kg bodyweight/day for 45–60 days.



## Worksheet R11. Supply Logistics (Transport and Storage)

(See [Worksheets D6](#) and [D3](#), Rows 122–162, where assumptions, in dark green, are first recorded.)

Transport costs are often the largest item in a Central-level CMAM budget (especially when donors pay for the RUTF itself). Storage costs are usually less significant but are linked; it might be possible to reduce the frequency of deliveries (and hence transport costs) through increased investment in storage space by, for example, making it bigger or more secure.

[Worksheet R11](#) flags when the space occupied by the average delivery is larger than the space available in vehicles or stores. When this happens, the user should consider increasing either the space in vehicles and storage units or the frequency of delivery.<sup>18</sup> The latter is easier, but it might not be the most efficient approach. The Tool can be used to explore the cost implications of the different responses by changing the relevant variables in [Worksheets D3](#), [D7](#), and [D9](#) and rerunning the analysis.

[Worksheet R11](#) calculates the amount of time required (for a driver) and the distance covered to make annual deliveries of therapeutic food using the following assumptions.

- Deliveries are done separately to each site. Delivering to more than one site at a time reduces the transport requirements.
- The shelf-life of RUTF (e.g., 24 months for Plumpy'nut®), F-75, F-100, and ReSoMal and/or combined mineral-vitamin mix (CMV) do not act as any practical constraint on the frequency of deliveries. If products with a significantly shorter shelf-life are used, it might be necessary to factor this into the decision on frequency of delivery.
- CMAM takes on the entire recurrent cost of making therapeutic food deliveries. It might in fact be possible to take advantage of trips made for other purposes (e.g., delivery of other supplies) and share the costs or to call on the community to help with transport. These strategies would reduce costs and are discussed in the section on analysis ([Part 5](#)).
- RUTF and therapeutic milk are distributed and stored together at Inpatient Care sites.
- Children with SAM with medical complications will receive 1 kg RUTF while in Inpatient Care and 11 kg of RUTF in Outpatient Care later.
- The cost of transport and storage of other supplies is relatively small and can be accommodated through existing routine deliveries of other health supplies. If caseloads increase significantly due to CMAM or current arrangements for distribution of other supplies is unsatisfactory, there might be a need to explicitly consider the transport and storage for other supplies.

<sup>18</sup> This alert is a conservative one based on the assumption that deliveries are on-demand (when supplies run out). If instead, as is often the case, deliveries are made on a regular schedule, there will be some kind of stockpiling in the low season and a need for more space sooner than the Tool predicts.

## Worksheet R12. Training

(See [Worksheet D3](#), Rows 164–184, where assumptions, in dark green, are first recorded.)

Training is a vital element in CMAM: Health care providers need training on treatment; COWs need training on community assessment, mobilization, and screening; and health managers need training on planning, budgeting, supply systems, and monitoring.<sup>19</sup> Until CMAM becomes part of pre-service education, this training is done in-service. The following assumptions are incorporated into [Worksheet R12](#)'s model of training costs.

- For each new Area, 4 health managers from Area HQ are trained for 5 days. For each established Area, 2 health managers from Area HQ receive 1 day of training. Two health managers from each Group-Area are trained for 10 days if the Group-Area is new to CMAM or for 2 days if it is not.
- Three health care providers from each new Outpatient Care site and 4 from each new Inpatient Care site are trained for 5 and 6 days, respectively. Two health care providers from each established Outpatient Care site and each established Inpatient Care site receive a 2- and 6-day refresher course, respectively. Classroom training is followed by 2 months of mentoring under the supervision of trained health care providers.
- New COWs (or volunteers) require 5 days of training or 1 day of refresher training each year if already trained. Each year, 25% of COWs/volunteers drop out or transfer and need to be replaced (i.e., require full training). Community outreach activity sites (and COWs and volunteers) are assumed to be distributed equally among different Outpatient Care sites.
- Class sizes for all training are kept at 25 participants or below and assumed, in the first instance, to be 20 participants. The Tool allows for the possibility that trainers receive an honorarium.
- Training is usually provided by staff from the next hierarchical level (e.g., Area health managers are trained by Group-Area health managers), except for training at Inpatient Care sites, which is done by a cadre of specially trained trainers: Three senior health care providers from each new Group-Area are trained for 5 days as facilitators by the Central-level course director (his or her time is factored into the fixed costs at the Central level).
- If trainees stay overnight, their costs include per diem and one return journey; otherwise, they receive no per diem, but as many return journeys as there are days of training. In both cases, refreshments are provided to all participants.
- Each trainee travels separately, full and refresher trainings are held separately, Inpatient Care and Outpatient Care trainings are separate, and each Outpatient Care site trains its own COWs.

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<sup>19</sup> Other training might be necessary in the early stage (e.g., training on policies and strategies for policy makers, and on SAM guidelines, curriculum development, and medical protocols for those in teaching institutions), but this is assumed to be part of the activities described as Central-level management establishing CMAM (see [Worksheet R6](#)).

## Worksheet R13. Supervision

(See [Worksheet D3](#), Rows 186–198, where assumptions, in dark green, are first recorded.)

Supervision is an essential element in any CMAM service/program. It needs to be more intense in the early stages—the first few months—with more frequent visits, which will generally focus specifically on CMAM to ensure the required skills for CMAM are mastered. Thereafter, supervision is less frequent and probably integrated with supervision for other purposes.

Exactly how much supervision is appropriate depends on several factors, including how much training individuals have received specifically in CMAM and on their general skills and experience level. The Tool embodies the following assumptions about how much supervision is required to be effective.

- A mid-level health manager from Area HQ is appointed coordinator/supervisor and visits each established Outpatient Care and Inpatient Care site in his or her Area every month, spending 2 hours on each visit.
- New Outpatient Care and Inpatient Care sites are supervised every week for 2 months, then fortnightly for another 2 months and monthly thereafter by a mid-level health manager from the Area HQ, spending 2 hours on each supervisory visit.
- New and established Outpatient Care sites have a weekly 1-hour (internal) supervision from the medical officer in-charge (senior health care provider).
- Every new CHW receives monthly 2-hour supervision from a senior health provider from an Outpatient Care site. Every established CHW has a 2-hour supervisory visit from a senior health provider from the Outpatient Care site once every 3 months. Community work is often overseen by a coordinator at Area HQ.
- Each new Area receives a 4-hour supervisory visit from Group-Area HQ (mid-level staff) every month. Each established Area receives a 2-hour supervisory visit from Group-Area HQ (mid-level staff) 4 times a year.
- To calculate the transport costs associated with supervision, the Tool estimates the distances travelled by supervisors and applies the person-price per km provided by the user. Except for supervision of COWs and volunteers, we assume that supervisory visits are not single purpose. Supervisors take advantage of the trip to supervise other activities or conduct other tasks. To take this into account, the Tool attributes a share of the travel costs to CMAM as follows: “time in CMAM supervision”/ (“hours in a working day” - “travel time”). For example, if the return journey takes 1 hour, the CMAM supervision lasts 2 hours, and there are 8 hours in a day, then  $2 / (8 - 1) = .29$ . Therefore, 29% of travel costs will be attributed to CMAM ( $.29 \times 100 = 29\%$ ).
- In many instances, CMAM is integrated within routine health services. Therefore, it is possible to take advantage of trips made for purposes other than supervision (e.g., delivery of supplies or trips for the supervision of other child health and nutrition services or as part of overall district health management) and, therefore, to share the costs. These joint strategies would reduce costs and are discussed in the section on analysis ([Part 5](#)).

## Worksheet R14. Community Outreach

(See [Worksheet D3](#), Rows 66–81, where assumptions, in dark green, are first recorded.)

**Worksheet R14** focuses on the resources required to develop and maintain community outreach through personal visits from trained personnel.<sup>20</sup> Community outreach can be done by health care providers, by other outreach workers who are salaried and assumed to be based near an Outpatient Care site, or by volunteers who live in the community and have no salary, though they may receive in-kind incentives. The Tool allows for these different possibilities and adjusts the calculations of manpower costs and travel accordingly. **Worksheet R14** assumes the following.

### To establish CMAM community outreach:

- Each new Outpatient Care site requires 5 days of a senior health care provider and a junior health care provider from the Outpatient Care site and 1 day of mid-level Area HQ health manager to prepare and design community outreach materials and guidance on strategies for community assessment and mobilization, mapping of communities, community activities and actors, and identification of communities with outreach activities or central screening sites.
- Each new site for community outreach activities requires 2 days of a senior health care provider and a junior health care provider from the Outpatient Care site to run community meetings and train volunteers.

### To manage cases in the community, COWs (staff or volunteers) need to devote:

- One day per month to each site for community outreach activities for each of the following:
  - Community mobilization and discussions with community members on CMAM-related issues
  - Identification of new cases and their referral to Outpatient Care
  - Home visits for problems cases, including absentees and defaulters
- One day per month in Outpatient Care, completing home visit cards, reporting, and coordinating with (other) health facility staff
- Two days each year in community outreach interacting with community leaders and conducting a community assessment
- In terms of travel, the above activities translate into either 1) one visit to the Outpatient Care site per month per community-based volunteer (in a system where community-based volunteers are involved in community outreach) or 2) three visits per month (for follow-up of defaulters, identification of new cases, and community mobilization) and one annual visit (for liaison and community assessment) to each community outreach site for outreach workers based in the Outpatient Care site (in a system where health facility staff are involved in community outreach).

<sup>20</sup> In urban systems, outreach through personal visits might not work well, and it might be preferable to focus on promoting CMAM through the mass media. The Tool does not address this scenario.

# Part 5. Interpreting the Results

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## What the Results Tell You

**Worksheets R1** to **R14** present the results generated from the Costing Tool. They document the amount and value of the resources required to implement the CMAM service/program, whose scope is defined in **Worksheets D1** and **D2**. The Costing Tool is designed primarily to answer the question “what does it cost (in resources and finances) to implement CMAM in a defined Area?” This is essential information for budgeting, planning, and advocacy.

It is also possible, though less straightforward, to use the Costing Tool to address the inverse question of how much you could achieve in terms of tackling SAM within a fixed budget (for CMAM as a whole or some specific components of it). This second question can be tackled by experimenting with different scales of CMAM, generating cost estimates from the Costing Tool, and seeing if those quantities fall within the limits set by available budgets. If the initial CMAM plan generates costs that are too large, you need to adjust the size of the service/program so that the requirements it generates are compatible with those limitations.

## Analysis: Some Principles and General Advice

**For budgeting purposes**, focus on **Worksheets R1** to **R5**, which summarize the quantities of resources required to implement CMAM specified by the user (**R1** to **R4**) and the value of those resources in financial terms (**R5**). **For planning** (deciding what to do when and with what resources), the user might find the tables in **Worksheets R6** to **R14** more helpful, as these document resource and finance requirements by activity.

**Maintain disaggregation of the results** and do the analysis in as decentralized a way as resource provision demands. Many potential donors require quite a high degree of specificity about the activities they are supporting and the inputs they are providing: Some donors might agree to pay for capital items but not their recurrent costs or support training but not salary costs or pay for RUTF but not its transportation. Maintaining disaggregation by Area is also important, especially for those elements likely to be financed from local budgets (e.g., transportation).

**Maintain the distinction between resources and costs.** Depending on the type of resource and the perspective of the person using the Tool, the quantities of resources required might be more relevant and meaningful for planning than the (financial) costs of those resources. For example, a health manager who does not have control over the financing of manpower but who is in a position to allocate the staff he or she has to different activities has little use for information on staff costs, but finds data on “hours of staff time required to implement CMAM” very useful.

Start with the results for the first year. If you have results for more than 1 year, **do the same kind of analysis as for the first year for each of the subsequent years**. You might wish to consider the patterns over time for financial requirements overall or for selected resources of special interest.

One of the important features of the Costing Tool is the ease with which different scenarios can be explored. New results tables can be generated as soon as new data are entered. Users are encouraged to experiment and to run through the budgeting exercise several times, changing key features and identifying what works best.

## Suggested Steps

We recommend the following five steps in analyzing the results.

1. Assess the accuracy and relevance of your results.
2. Estimate *additional* resource requirements.
3. Create a new budget and compare new resource requirements with available resources.
4. Consider ways to reduce costs.
5. Use results for advocacy.

The following sections take each of these in turn and discuss them in a little more detail.

## Assess the Accuracy and Relevance of Your Results

**Check your country-specific data.** Examine each of the results worksheets (**R1** to **R14**) in turn. Are the results reasonable? If they look surprising, go carefully over the values you inserted in the gold-colored cells in **Worksheets D1** to **D8**. Take special care with the units you expressed the data in. Check and resolve any alerts and error messages.<sup>21</sup>

**Revise built-in assumptions.** Consider whether the assumptions adopted by the Tool (in the dark green-colored cells) are appropriate for your country. Change them if necessary, but take care; these variables are fixed by the Tool because they reflect the current understanding of what constitutes a good CMAM service/program and should be changed only after careful consideration. Such consideration might already have happened in the process of developing your country's national CMAM guidelines. If so, use these guidelines and substitute country-specific values for the default variables in the Tool.

Take training for example. Training is an important and costly element in any CMAM service/program. The Tool makes various assumptions about who is trained and for how long. It is tempting to reduce the number of staff trained or the length of their training (because of the disruption caused by removing health care providers from their normal routines), but there are risks that users should be aware of.

- It is important to have a critical mass of health care providers familiar with CMAM in each health facility to ensure that CMAM gets established.

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<sup>21</sup> **Note:** Formatting might mean that values are recorded to more decimal places than obvious from the tables. This might account for some apparent discrepancies.



- Health care providers need to be confident and competent with CMAM. This requires consolidation of knowledge and practice. A reduction in days of training should be considered only if accompanied by more frequent and intensive supervision.

**Deal with uncertainty.** There might be variables (in gold- or dark green-colored cells) about which you are uncertain. Take advantage of the ease with which the Tool can recalculate the results when new data are entered.

1. For each uncertain variable, identify a plausible range of values.
2. Run the Costing Tool twice, first with the minimum- and then with the maximum-likely values.
3. If the two values generate significantly different cost or input requirement results, either seek additional information to make a more precise estimate of the value of the uncertain variable or, if this requires too much effort, choose an intermediate value that reflects the most likely scenario.

## Estimate Additional Resource Requirements

The Costing Tool calculates as comprehensively as possible the resources required for implementing CMAM. It avoids the dangerous presumption that the existing health system can absorb any of the demands of CMAM for staff or space.<sup>22</sup> This is a desirable starting point for any generic tool. However, a user might not need to include all of these resources in his or her budget. Some of the resources will be (or could be) essentially costless to the CMAM service/program as a result of:

- Utilizing spare capacity in the system
- Integrating CMAM activities with other services, programs, or activities
- Redeploying resources used for treatment of children with SAM

The Tool shows the full resource implications of CMAM, but, when it comes to working out how much you might need to budget for, you can effectively deduct certain things from this list because they are already there or already budgeted for. This next step in the analysis gets the user thinking about which of those resources that the Tool identifies as required for CMAM might already be in some sense available and therefore do not require additional budgeting.

**Utilizing spare capacity in the system.** When CMAM is implemented as part of routine health services, there is often some spare capacity for CMAM to take advantage of. For example, health managers at Area HQ might not be very busy and might be able to take on CMAM duties without the need to employ additional personnel, or some staff might need to be hired but not as many as indicated in the Tool. Vehicles travelling to Area HQ or to Outpatient Care or Inpatient Care sites for other services/programs might have spare capacity and be able to deliver RUTF at the same time. Be careful of spare capacity in your assessment so that you are not proposing deflecting health resources away from a valuable current use to CMAM.

1. Consider for which inputs (especially personnel and space) and in which Areas there is likely to be spare capacity, i.e., time and space that are not being effectively used.

<sup>22</sup> It is dangerous because, if misplaced, it could result in implementing a poorly resourced, inefficient CMAM program or in undermining the operation of other vital services.



2. Investigate how occupied these resources already are and how much spare capacity is available.
3. Consider whether it is possible and appropriate to utilize the existing resources for CMAM.
4. Take the results you have generated using the Tool, and indicate which specific costs (which inputs in which activities and which Areas) could be met by taking advantage of spare capacity in the health system.
5. Adjust the value of those specific costs downward to reflect the fact that the CMAM service/program could take advantage of existing spare capacity.

**Integrating CMAM activities with other services, programs, or activities.** Integrating CMAM activities with other services, programs, or activities expresses a similar idea to that of spare capacity discussed above, but focuses on *activities* rather than *inputs*. Integrating CMAM training with other training opportunities (e.g., for expanded program of immunization or child survival), for example, has the potential to reduce several costs, including transport and trainee and trainer time. Taking advantage of national child health weeks, immunization days, or routine health outreach for CMAM community outreach might similarly reduce time and transport costs. This potential might also exist *within* the CMAM service/program, for example, using CMAM supervisory visits to also carry RUTF supplies.

1. Identify CMAM activities where some kind of integration or sharing with other health services/programs might be possible.
2. Examine carefully how these services/programs and activities function and explore whether (and to what extent) integration with CMAM is feasible without unduly prejudicing the operation of those services/programs.
3. Take the CMAM budget you have generated using the Tool, and indicate which costs could be met by integrating CMAM with other activities.
4. Revise downward the estimated requirements accordingly.

**Redeploying resources used for treatment of children with SAM.** Children with SAM might already be occupying a number of hospital beds. Indeed, occupancy might actually be higher before the introduction of CMAM than afterward,<sup>23</sup> in which case there might be no need to make arrangements for additional bed space or staff time over and above that currently budgeted for children with SAM. The analysis here should focus on specific inputs, not on general budgetary reallocation. We are not suggesting here that the total estimated cost of the current treatment of children with SAM should be deducted from the costs of the CMAM service/program, but rather that specific resources that are available currently for SAM treatment could easily be redirected to CMAM without having to make a new case for more resources.

1. Determine how many children with SAM are currently being managed by the health system in the absence of CMAM.
2. Determine which resources are being used for that purpose and what they cost.
3. Consider whether it is possible and appropriate to redirect these resources to CMAM.

<sup>23</sup> This is certainly what would be expected if the same number of children with SAM is being treated overall (since a much smaller proportion of them will be hospitalized under CMAM and these children will spend a shorter amount of time in hospital). It may still hold true even though it is likely that with CMAM—a service/program with a strong outreach component and attractive features—numbers seeking care will increase.

4. If so, take the results you have generated using the Tool, and indicate which specific input (or activity) costs will be met from redeploying current resources used for the (non-CMAM) treatment of children with SAM and for which you do not, therefore, require additional resources.
5. Revise downward the estimated requirements accordingly.

## Create a New Budget and Compare New Resource Requirements with Available Resources

Take the Costing Tool calculations and map out any reductions you have been able to identify as a result of redeployment, sharing, or integration, and then prepare your revised budget/plan.

Compare the new budget you have developed with the resources you have available or expect to be able to access (from government, donors, the United Nations, NGOs, community-based organizations, or the community). Do this for the budget as a whole and for each main activity and input. Consider who will provide what is necessary, how quickly, whether support will be in-kind or financial, and whether there are strings attached (for example, requirements to purchase goods from specified sources).

Does this analysis suggest there are likely shortfalls in available resources or finance? Donors very often specify particular inputs, activities, or regions that they are prepared to support, making it likely that some inputs, activities, or Areas are more difficult to finance. Identifying those is an important part of planning for CMAM, and special efforts need to be devoted to securing funding or resources for those potential implementation bottlenecks.

If the resources you have available or can access do not match the requirements identified by the Tool, you need to consider modifying the planned CMAM service/program and reducing your budget.

## Consider Ways to Reduce Costs

Resist focusing directly on cutting back on specific activities or inputs. CMAM involves a *package* of interrelated activities. It is not enough, for example, to buy RUTF supplies; therapeutic food must be transported and stored if the CMAM service/program is to work at all. And if RUTF *is* available but health care providers are not adequately trained or supervised, the standard of care could deteriorate and undermine the effectiveness of the service/program. In turn, providing RUTF but not having medicines to treat underlying health conditions could be a waste of time and effort.

A much better approach to reducing costs is to generally scale back the *service/program*, restricting the geographic coverage of CMAM (the number of Areas or Outpatient Care and Inpatient Care sites within those Areas), while still ensuring that the package is left intact. When resources are limited, providing adequate services to fewer Areas or sites is a better option than maintaining coverage with substandard services.

Experiment with a few different scenarios. Explore the effects on costs (total costs and the costs of specific activities and inputs) of changing the number and location of Areas or Outpatient Care and Inpatient Care sites to establish in each active Area.<sup>24</sup>

- **To add a new Area**, increase by “1” the value of “number of Areas to be budgeted for” (**Worksheet D1**, Point 6), and complete any new gold-colored cells that, as a result, will be highlighted in the rest of the data worksheets (**D2** to **D8**).
- **To remove an Area**, record “0” in all the gold-colored cells (the number of Outpatient Care and Inpatient Care sites, community outreach activity sites, and SAM cases) for that Area in **Worksheet D2**.
- **To change the number of Outpatient Care or Inpatient Care sites in an existing Area**, change:
  - The values in the gold-colored cells for that Area in **Worksheet D2** (including, if necessary, the number of SAM cases and community outreach activity sites)
  - If necessary, the average distance and time between Outpatient Care/Inpatient Care sites and Area HQ (**Worksheet D3**, Rows 123-132)

## Use Results for Advocacy

The results of the Tool are primarily intended to *inform* managers and donors about resource requirements for CMAM. They can be expected to reveal that to implement CMAM requires significant investment—treating children with SAM is never inexpensive. Nevertheless, the results from the Costing Tool can be a persuasive component in any advocacy efforts to get more support for CMAM.

- When put in the context of alternative approaches to this problem, the results from the Tool are likely to show that CMAM is the least costly approach.
- A strong case can be made for the accuracy and relevance of the cost estimates, which 1) have been generated in an objective and comprehensive fashion (there is no attempt here to minimize or disguise the costs), 2) embody assumptions based on current understanding of what works best technically, and 3) take account of a country’s own circumstances.

<sup>24</sup> We are assuming that the number of SAM cases is not directly controlled by the service/program and is a function of where the Outpatient Care and Inpatient Care sites are established. In practice, the way the CMAM service/program is designed influences how many existing SAM cases enroll in CMAM.

# Appendices

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## Appendix 1. Guide to the Selective Use of the Costing Tool for Health Managers at Different Levels

The following table outlines for each level of health manager which worksheets he or she needs to focus on in terms of both filling in data (i.e., **Worksheets D1 to D9**) and analyzing the results (i.e., **Worksheets R1 to R14**).

How Comprehensively the Data Worksheets Need to be Filled In				
Worksheet	For health managers at the level of:			
	CMAM site	Area	Group-Area	Central
<b>D1</b>	All (record 1 Group-Area, 1 Area)	All (record 1 Group- Area, 1 Area)	All (record 1 Group- Area)	All
<b>D2</b>	All (record 1 Area, 1 Outpatient Care site)	All record (1 Area)	All	All
<b>D3</b>	Selective (with care)	Selective (with care)	Selective (with care)	All
<b>D4</b>	Selective (with care)	Selective (with care)	Selective (with care)	All
<b>D5</b>	Selective (with care)	Selective (with care)	Selective (with care)	All
<b>D6</b>	All	All	All	All
<b>D7</b>	Selective (with care)	Selective (with care)	All	All
<b>D8</b>	N/A	N/A	Selective (with care)	All
<b>D9</b>	All	All	All	All
How Much of the Results Are Relevant				
Worksheet	For health managers at the level of:			
	CMAM site	Area	Group-Area	Central
<b>R1</b>	Selective	Selective	Selective	All
<b>R2</b>	Selective	Selective	Selective	All
<b>R3</b>	Selective	Selective	Selective	All
<b>R4</b>	Selective	Selective	Selective	All
<b>R5</b>	Selective	Selective	Selective	All
<b>R6</b>	Ignore	Ignore	Selective	All
<b>R7</b>	Ignore	All	All	All
<b>R8</b>	All	All	All	All
<b>R9</b>	All	All	All	All
<b>R10</b>	All	All	All	All
<b>R11</b>	All	All	All	All
<b>R12</b>	All	All	All	All
<b>R13</b>	All	All	All	All
<b>R14</b>	All	All	All	All

## Appendix 2. Estimating the Number of Severe Acute Malnutrition Cases

Each child with severe acute malnutrition (SAM) who enrolls in community-based management of acute malnutrition (CMAM) generates a relatively predictable cost burden, which is why the variable “number of SAM cases” (the number of children with SAM admitted to CMAM in a year period) is a key one for the Costing Tool. Unfortunately, it is a variable that is rarely measured directly, and it is almost always necessary to estimate it from other data. Three main factors determine its value:

1. The incidence rate of children with SAM in the community over a period of 1 year
2. The uptake of (and defaulting from) CMAM services/programs by children with SAM
3. The criteria used to assess SAM and to identify and admit children with SAM into CMAM

**Incidence of SAM.** The SAM incidence rate in the community (the number of new cases of SAM arising in a year) is difficult to measure directly because it requires identifying cases as they emerge and collecting data over a period of time. No countries have reliable estimates of the *incidence* of children with SAM.

To circumvent this problem, the *point prevalence* of SAM is used and converted to a rough estimate of incidence using assumptions about the length of time it takes for children to become severely malnourished and how long they remain in that state (i.e., average duration of SAM), which is approximately 4–6 months. Seasonal fluctuations in incidence make this conversion not entirely reliable, but, roughly speaking, incidence rates are likely to be at a maximum twice the prevalence rates.

The SAM prevalence rate in the community (the number of cases present at a certain point in time) is measured by exhaustive screening (rare, unless for confined populations) or population-based surveys (relatively common), where a random sample of the population is assessed and the point prevalence is estimated at one point in time (a representative snapshot) with a certain degree of precision. In the case of using prevalence estimates, results need to be interpreted, taking into consideration such factors as the timing of the survey and seasonality (can we assume that the prevalence at the start of the program is similar to the prevalence at the time of the survey, in case the survey was not done at the start of the program?), study population (are we considering the same population?), plausibility of data (was the survey method validated?), criteria used to identify children with SAM (are the criteria used for prevalence the same as we will use for identifying and admitting children with SAM for treatment?), precision of the estimated point prevalence (can we use the prevalence estimate with confidence—narrow confidence interval—or do we need to take into consideration wide fluctuations from the real population value—wide confidence interval?).

Most countries conduct national surveys, such as Demographic and Health Surveys (DHS) or the Multiple Indicator Cluster Survey (MICS), which provide some

information on the prevalence of moderate and acute wasting.<sup>25</sup> Countries affected by a crisis might have these data at the district level.<sup>26</sup> Survey results might be available from previous periods or for similar populations and can be used with care as a rough indication of the true prevalence value.

**CMAM service/program access and uptake (coverage).** Not all children suffering from SAM will seek treatment. Some families will not know about the service; others will not trust or value it or will not have the resources to access it. Survey techniques such as centric systematic area sample (CSAS) or the semi-quantitative evaluation of access and coverage (SQUEAC) can be used to estimate the proportion of children with SAM seeking treatment, but they are expensive to conduct and information on coverage is not available in many countries. CMAM services/programs with effective community outreach and with an appropriate strategy for early detection and referral of children with SAM can reach coverage of about 70% of the targeted population. In the early stages of CMAM service/program set-up, this figure could be as low as 20%.

**Criteria for assessing SAM.** Severe wasting in a child 6–59 months of age can be measured in two different ways:

- **Mid-upper arm circumference (MUAC)** < 115 mm
- **Weight-for-height (WFH)** in z-score < -3 standard deviations (SDs) of the median according to the World Health Organization (WHO) 2006 Child Growth Standards

MUAC and presence of bilateral pitting edema are the techniques generally employed in active case finding of SAM in the community. MUAC has also been endorsed as an independent criterion for admission and is used alongside WFH for admission of severely wasted children to treatment.<sup>27</sup> MUAC is relatively easy to measure and a better predictor of mortality than WFH. On the other hand, WFH is the measure used to estimate the prevalence of wasting in cross-sectional nutritional surveys. These two measures do not coincide in their identification of children with severe wasting, making it difficult to predict accurately from nutritional surveys (which are likely to be the source of malnutrition data) how many children active screening will identify as eligible for CMAM. A further problem arises as presence of bilateral pitting edema, an acute condition, is often inaccurately assessed and thus underestimated in cross-sectional nutrition surveys.

**Conclusion about how to estimate “number of SAM cases” to be expected to enroll in a service/program in a year.** The “incidence of SAM cases enrolling into CMAM in an Area” can be estimated by either:

1. Projecting trend data from numbers of children enrolled in CMAM services/programs in similar Areas with CMAM
2. Multiplying by 2 the estimated point prevalence of SAM (from a population-based survey): This figure takes into account the number of cases at the start of the period (prevalence = factor one) and the expected new cases to develop

<sup>25</sup> These data are reported in the WHO's Global Database on Child Growth and Malnutrition, available at [http://www.who.int/gdgmwho/p-child\\_pdf/](http://www.who.int/gdgmwho/p-child_pdf/). UNICEF's [www.childinfo.org](http://www.childinfo.org) is a more user-friendly source of these data.

<sup>26</sup> See the database of the United Nations Standing Committee on Nutrition/Nutrition in Crisis Situations database, available at <http://www.unscn.org/en/publications/nics/database.php>.

<sup>27</sup> WHO and UNICEF, 2009, *WHO Child Growth Standards and the Identification of Severe Acute Malnutrition in Infants and Children: A Joint Statement by the World Health Organization and the United Nations Children's Fund*.



in 1 year (incidence = 2 x factor one), providing an estimate for a total case load in 1 year and likely service/program coverage (multiply caseload by 0.66, if estimating 66% coverage on average).

**Note:** In case there is a known risk or potential that children with SAM from neighboring Areas (or from across the border) would seek care for SAM in the Area, an estimate for an extra expected caseload needs to be taken into consideration.

# Case Study and Exercise

## Case Study: Example of a Completed Costing Tool Workbook

This case study provides costing for CMAM in the Greater Accra Region (a Group-Area) in Ghana, which plans to implement community-based management of acute malnutrition (CMAM) in five districts (Areas) in 2011. It provides an opportunity to view the CMAM Costing Tool Workbook with data from a real-life situation in a completed Workbook. (See **CMAM Costing Tool – Case Study Workbook**.)

### Background on CMAM in Ghana

Prior to 2007, the Ghana Health Service (GHS) addressed the management of children with severe acute malnutrition (SAM) in hospitals and nutrition rehabilitation centers. These services did not yet follow the World Health Organization (WHO) 1999 treatment protocol for the management of SAM<sup>28</sup> or the CMAM approach.<sup>29</sup> The CMAM approach was introduced to senior health managers and senior clinicians in a June 2007 national workshop given by the GHS with support from UNICEF and the United States Agency for International Development (USAID). Following the workshop, interim national guidelines were drafted, a national program coordinator was appointed by the GHS to coordinate CMAM implementation, and a strategy for strengthening capacities and gradual integration and scale-up of CMAM in the country was developed.

CMAM scale-up in Ghana is ongoing and uses a two-group, phased approach. The first group targets five regions for scale-up: Upper West, Upper East, Northern, Central, and Greater Accra. The second group will target the other five regions: Western, Eastern, Volta, Ashanti, and Brong Ahafo. Each region (e.g., Greater Accra Region) begins CMAM service implementation in one district at a limited number of Outpatient Care and Inpatient Care sites, which act as learning sites for the region. Learning sites are places where CMAM is implemented to the highest possible standard so other practitioners can visit for training, internships, and mentoring. Services are then gradually scaled up to the rest of the districts in the region.

CMAM services are provided in government and Christian Health Association of Ghana health facilities. Outpatient Care for CMAM is provided at polyclinics, health centers, Community Health Planning Services (CHPS), and decentralized mobile outreach clinics. Usually, a medical assistant or officer manages the Outpatient Care

<sup>28</sup> WHO, 1999, *Management of severe malnutrition: A manual for physicians and other senior health workers*.

<sup>29</sup> WHO/United Nations System Standing Committee on Nutrition/UNICEF, 2007, "Community-Based Management of Severe Acute Malnutrition,"

[http://www.who.int/nutrition/topics/Statement\\_community\\_based\\_man\\_sev\\_acute\\_mal\\_eng.pdf](http://www.who.int/nutrition/topics/Statement_community_based_man_sev_acute_mal_eng.pdf) and WHO/UNICEF, 2009, "WHO child growth standards and the identification of severe acute malnutrition in infants and children,"

[http://www.unicef.org/nutrition/files/stmt\\_child\\_growth\\_sam\\_final.pdf](http://www.unicef.org/nutrition/files/stmt_child_growth_sam_final.pdf).

service, while community health or public health nurses are in charge of the case management. The medical assistant/officer assists with review of children presenting with danger signs based on the action protocol.

Inpatient Care for CMAM is provided in hospitals (district, regional, or national referral hospitals) with 24-hour care. A senior clinician or pediatrician manages the Inpatient Care site and is in charge of the case management upon admission and the daily monitoring. A nurse is responsible for taking vital signs, performing anthropometry, administering drugs, and providing daily care in Inpatient Care. The hospital dietician prepares therapeutic feeds for children with SAM in Inpatient Care. In hospitals where there is no dietician, the nurse is also responsible for preparing the therapeutic feeds.

Community outreach, which is a major component of CMAM services, focuses on active case finding and referral of children with SAM, and follow-up of children identified as failing to adequately respond to the treatment of SAM. In liaison with community opinion leaders, volunteers are trained and conduct the active case finding and referral. The volunteers who live within the same communities as children with SAM also follow up with children during treatment. Volunteers used for CMAM activities also conduct other GHS health and nutrition activities at the community level. Each community has at least one community volunteer, and, in situations where the community is too large, two or more community volunteers support the community outreach activities. Community health nurses who visit all communities at least once every month supervise community health volunteer activities. In urban areas where community volunteers are not very active, community health nurses also conduct active case finding and referral, and follow-up of SAM cases.

## Exercise: Practice Using the Costing Tool

This exercise gives the user a guided opportunity to practice using the CMAM Costing Tool and to fill in the Workbook with real-life costing data for one district (Area) in Ghana. The corrected exercise is also made available (See CMAM Costing Tool – Exercise Corrected).

The following data are provided to complete the Workbook for this exercise.

Note: For the sake of this exercise, the automatically generated information was not adjusted; instead, the defaults were accepted.

### Worksheet D1. Background

This exercise provides information for costing CMAM services for one district in Ghana, where CMAM has already been established at the Central level. Ashiedu Keteke district is a learning site for Greater Accra Region, which initiated CMAM in April 2008. The base year for planning is 2010.

Ashiedu Keteke district is the Area, and Greater Accra Region is the Group-Area.

The local currency is the Ghanaian New Cedi (Cedi). The exchange rate used is 1.43 Cedi to 1 U.S. dollar (US\$). Prices used for costing are based on the market value.

### Worksheet D2. Scale

Based on Demographic and Health Surveys (DHS) 2008 data, in Ashiedu Keteke, it is estimated that 150 children under 5 years of age have SAM. The most recent reliable nutrition data available are from the DHS 2008, which provides SAM rates disaggregated by region.

In total, there are 100 communities in Ashiedu Keteke, each with community outreach activities. Community outreach services take place at the village/community level. Each community has identified one volunteer who supports all child health activities, including CMAM, at the community level. The volunteer collaborates with the village chief and other opinion leaders, such as the “queen mothers.” The volunteer is supervised by a community health nurse/officer, who is responsible for supervising a group of volunteers covering a number of communities (three to eight communities).

Ashiedu Keteke has a children’s referral hospital (Princess Marie Louise Hospital) that provides Inpatient Care and Outpatient Care services. Ashiedu Keteke has one other Outpatient Care site, which is located at Ussher Poly Clinic.

### Worksheet D3. Epidemiological, Demographic, and Service Data

**Epidemiology of SAM.** Based on the Ghana 2008 DHS, it is estimated that of the total number of children under 60 months of age with SAM, 10% are 0–6 months, 13% are 6–11 months, 25% are 12–23 months, and 52% are 24–59 months.

The average length of stay for children 6–59 months in Inpatient Care is 7 days and for infants 0–6 months is 30 days.

**Community outreach.** Volunteers carry out community outreach.

**Treatment: drugs for associated health issues.** Approximately 20% of children with SAM have symptoms of malaria, and approximately 35% are dehydrated upon admission to Inpatient Care.

Ashiedu Keteke is a malaria-endemic area. According to the Ghana standard treatment guidelines, all children must be tested for malaria using the rapid diagnostic test kit (paracheck) before being administered treatment. In Ashiedu Keteke, 75% of children with SAM and symptoms of malaria have the diagnosis confirmed through diagnostic testing. The national protocol recommends the use of artemisinin-based combination therapy (ACT) for the treatment of malaria. However, the current practice in Ashiedu Keteke is to provide malaria treatment to all children with SAM in Areas where malaria is endemic (presumptive treatment).

Children admitted to Inpatient Care in Ashiedu Keteke also receive hemoglobin, glucose, and HIV tests. Occasionally, tuberculosis tests are prescribed if the child has been in contact with a known tuberculosis patient or carrier.

**Transport.** Ashiedu Keteke is located within Accra Metropolitan Area, about 5 km from the Area HQ. With average traffic in Accra, it takes about 15 minutes from the Area HQ to the Outpatient Care and Inpatient Care sites in Ashiedu Keteke.

*(continued)*

It is about 1 km from the Area HQ office to the Group-Area HQ office, which is a 10-minute walk or 2–3 minute drive.

One Outpatient Care site is located within the same hospital where the Inpatient Care site is located; the other Outpatient Care site is about 3 km from the Inpatient Care site, approximately a 30-minute walk. All communities are within a 3 km distance, about a 30-minute walk from the Outpatient Care site nearest to them.

**Storage.** Ghana uses Nutriset ready-to-use therapeutic food (RUTF) manufactured in France. Recently, UNICEF provided the Greater Accra Region with prepackaged F-75 from Nutriset. In special cases, children cannot take RUTF after their medical condition has been stabilized. This accounts for approximately 5% of children admitted to Inpatient Care. In these special cases, children are rehabilitated using F-100. F-100 is prepared from locally available ingredients: milk, oil, sugar, and imported combined mineral and vitamin mix (CMV). The hospital buys milk powder, oil, and sugar and then mixes F-100 itself.

Each 23.5 x 24.5 x 28.5 cm storage box contains 4.8 kg of milk powder that is used to prepare F-100.

The region has a double-cab pick-up truck that is used for transporting nutrition supplies. The truck has a capacity of about 3 m<sup>3</sup>. The same type of truck is used for transporting CMAM supplies to the Outpatient Care and Inpatient Care sites.

Ashiedu Keteke Area has a space of 5 m<sup>3</sup> available for storing CMAM supplies.

An average space of 5 m<sup>3</sup> is available for storing CMAM supplies in each Inpatient Care and Outpatient Care site.

**Training for health managers, health care providers, and community outreach workers (COWs).** If training sessions last more than 1 day at the Group-Area and Area levels, training participants stay overnight. Travel costs to the training venue are reimbursed.

#### Worksheet D4. Price Data

The GHS health facilities do not make payments for the wards or storage facilities because they are government-owned facilities. Ghana's CMAM program does not provide bracelets to children receiving CMAM services. Therefore, do not fill in the cell in the worksheet, but instead leave blank. The hospital with Inpatient Care services does not provide food to caregivers. **Table 1** provides a summary of the price data.

**Table 1. Summary of Price Data**

Item/Variable	Cost in Cedi
Hall hire (per day)	120.00
Refreshments (per person per day)	12.00
<b>Per Diem (including meals and overnight accommodation but not transport) per Person per Day</b>	
Overnight for Group-Area, Area, Outpatient Care, or Inpatient Care health care providers	80.00
COW training	10.00
Allowance for Outpatient Care or Inpatient Care staff (excluding transport)	20.00
Monthly reports	0.30
<b>Medicines</b>	
Vitamin A (per 100,000 IU capsule)	0.02 (UNICEF price)
Sugar water (per L) (1 kg of sugar = 2 Cedi)	0.05
Amoxicillin (per g)	1.00 (UNICEF price)
ACT anti-malarial (per course)	3.00
Malaria test (per test)	1.00
Albendazole (per 100 mg tablet)	0.03 (UNICEF price)
ReSoMal (per 84 g sachet)	0.50 (UNICEF price)
Cost of non-malarial tests for SAM cases	5.00
Intravenous (IV) kits	0.60
Nasogastric tubes (per tube)	1.00
Measles vaccine (per dose)	1.00
Measles auto-disable syringe (per syringe)	0.20
Mixing syringes (per syringe)	0.20
<b>Patient Management</b>	
RUTF (per kg)	6.00 (UNICEF price)
F-75 (per kg)	4.50 (UNICEF price)
F-100 (per kg)	5.00
Outpatient treatment card (per card)	0.60
Inpatient treatment card for SAM children (per set)	1.00
RUTF ration card (per card)	0.50
Hand towel	1.00
Soap (per bar)	0.80
Drinking water (per L)	0.05
Stock control forms (per set)	0.10
<b>Training and Supervision</b>	
Materials for Area HQ supervision (supervisory visit)	0.50
Materials for Outpatient Care and Inpatient Care supervision (supervisory visit)	0.50
Materials for COW supervision (supervisory visit)	0.20
Training materials per COW	1.00
Training materials per Outpatient Care trainee	20.00
Training materials per Inpatient Care trainee	20.00
Training materials per Area HQ trainee	40.00
Training materials per Group-Area trainee (full training)	25.00
Training materials per Group-Area trainee (refresher training)	5.00
<b>Transport</b>	
Transport of personnel and patients/car per km per person at all levels (per km per person)	2.00
Transport of supplies of all kinds	2.00

### Worksheet D5. Salaries

**Table 2** provides the average annual salaries of Ghanaian health care providers and managers.

Trainers receive a daily rate of 50 Cedi as honoraria.

Community outreach work is usually done by staff and, in cases where volunteers are involved, they are not paid.

**Table 2. Average Annual Salaries in Ghana**

Health Care Providers and Other Staff	Provided Type and Functions They Perform	Average Annual Salary in Cedi
<b>At Central Headquarters</b>		
Senior Central HQ staff (head/deputy head of department)	Manage and advocate for CMAM at national level	18,000
Mid-level Central HQ staff (program manager)	Establish, coordinate CMAM activities	14,400
<b>At Group-Area Headquarters</b>		
Senior Group-Area HQ staff (graduation nutrition officers –more experienced)	Regional Nutrition Officer - management of CMAM	12,000
Mid-level Group-Area HQ staff (technical officers)	Assistant Nutrition Officer - supervision and training of Area HQ staff	9,600
Junior Group-Area HQ staff (community health nurse or officer at regional level)	Technical officer - monitoring/data collection and analysis and assisting with other management tasks	4,800
<b>At Area Headquarters</b>		
Senior Area HQ staff (district nutrition officer, graduate with 1–3 years)	Nutrition officer (graduate/technical officer) - Management of CMAM	9,600
Mid-level Area HQ staff (technical officers)	Technical officers/National service - Supervision and training of Outpatient Care sites/Inpatient Care sites	4,800
Junior Area HQ staff (community health nurse or officer at district level)	Technical officers/community health nurse - Monitoring/data collection and analysis and support to mid-level and senior staff	4,800
<b>At Outpatient Care Site - Health Care Providers</b>		
Senior Outpatient Care staff (senior nurse, medical assistant – health facility in-charges)	Medical assistant/midwives/clinical nurses - management of SAM cases, establishing community outreach, training of COWs, data management	10,200
Junior Outpatient Care staff (community health nurses, community health officers, and public health nurses)	Community health nurses - assisting with management of SAM cases, supervision of COWs, helping establish community outreach, data collection	4,800
COW	CMAM outreach in the community (volunteer)	0
<b>At Inpatient Care Site - Health Care Providers</b>		
Senior Inpatient Care staff (clinician, pediatrician, or other medical specialist)	Physician/pediatricians - in-house supervision of health care providers, managing SAM children with complications, data analysis	21,600



Health Care Providers and Other Staff	Provided Type and Functions They Perform	Average Annual Salary in Cedi
Mid-level Inpatient Care staff (clinical nurses, dieticians, graduate nutritionist)	Clinical nurses/graduate dietician/graduate nutritionist – day-to-day management of SAM in Inpatient Care, nursing care supervision of feeds and preparation, monitoring, and reporting	9,600
Junior Inpatient Care staff (health aids, health extension workers)	Health aid/health extension worker - assisting in care of SAM cases with complications, preparation of therapeutic foods, data collection	3,000
<b>Other Workers (All Levels)</b>		
Driver	Driving vehicles carrying supplies or people	1,800
Store guard	Guarding stores of RUTF	1,200

#### Worksheet D6. Fixed Supplies (for Outpatient Care and Inpatient Care Sites)

Ghana has adopted use of mid-upper arm circumference (MUAC) and bilateral pitting edema as indicators of SAM. Height is not taken, therefore weight-for-height/length is not retained as an indicator for wasting.

A checklist of CMAM supplies for Ghana with corresponding prices is provided in **Table 3**, along with their prices. The quantities needed are similar to the recommended numbers provided in the Tool (**Worksheet D6**), and the average length of useful life of these supplies is assumed to be the same as suggested in the Tool.

**Table 3. Outpatient Care and Inpatient Care Supplies with Prices in Ghana Cedi**

Supplies	Actual Number Used	Price per Unit in Cedi
Strong file to store admission/treatment cards	4	4.00
Small clock or watch with second hand	1	15.00
Bucket – plastic, graduated, lid, 8.5 L	1	6.00
Jug – transparent plastic, graduated, L	2	3.00
Marker pens (permanent ink)	1	2.00
Notebook	1	4.00
Metal spoons	2	1.00
Teaspoons	2	0.20
Nail clippers	1	10.00
Water carrier – plastic, 20 L (Veronica bucket)	1	10.00
Water jug (with lid)	2	4.00
Small metal bowl	2	0.50
Thermometer – electronic	1	5.00
Adult scale/electronic scale	1	175.00
Infant scale with 10 g indication	1	193.00
MUAC band	10	1.50
Calculator	1	5.00
Scissors	1	1.50

Supplies	Actual Number Used	Price per Unit in Cedi
Stapler and staples	1	5.00
Beaker – orange plastic (500 ml)	2	1.00
Set of communication materials for counseling on health and nutrition	1	20.00
Set of Job Aids	1	30.00
Copy of CMAM guidelines	1	50.00
Registration book	1	2.50
Monthly reporting forms	12	0.20
Tally sheets (weekly)	52	0.20
Set of cups and spoons	6	2.00
Food scale (up to 10 kg) for weighing milk powder (Inpatient Care only)	1	50.00

#### Worksheet D7. Frequency of Therapeutic Food Deliveries

CMAM supplies, including RUTF, are delivered from the Central level to the Group-Area every 3 months (i.e., 4 times per year), and from the Group-Area to the Area every 2 months (i.e., 6 times per year). The Area delivers CMAM supplies, including RUTF, to the Outpatient Care and Inpatient Care sites every 2 months (i.e., 6 times per year).

#### Worksheet D8. Group-Area and Central-Level Statistics

Eight health care providers are trained in the Greater Accra Region (Group-Area) to act as Inpatient Care and Outpatient Care facilitators (i.e., trainers of health care providers from other Inpatient Care and Outpatient Care sites). Facilitators are provided overnight accommodation during training that takes longer than 1 day.

The distance between the GHS Nutrition Department and Greater Accra Region is 5 km; with average traffic, it takes about 15 minutes to reach the Group-Area by car.

There is approximately 50 m<sup>3</sup> of space available for storing RUTF for Greater Accra Region.

Once every 6 months, the Ministry of Health provides the Nutrition Department with a truck (15 m<sup>3</sup>) to transport the RUTF from the Central warehouse to Greater Accra Region.

#### Worksheet D9. Time-Dependent Variables

This exercise predicts the first year costs. Therefore, it is only necessary to run the Tool once using the value of “1.”