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A Process Evaluation of the Tubaramure Program for Preventing Malnutrition in Children under 2 Approach (PM2A) in Burundi

March 2013

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THE SCIENCE OF IMPROVING LIVES

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Contents

LIST OF TABLES

LIST OF FIGURES

Abbreviations and Acronyms

BCC	behavior change communication
BM	beneficiary mother(s)
BMCG	beneficiary mother care group(s)
CHW	community health worker(s)
CMAM	Community-Based Management of Acute Malnutrition
CRS	Catholic Relief Services
CSB	corn-soy blend
DHA	district health authority(ies)
EHA	Essential Hygiene Actions
ENA	Essential Nutrition Actions
FANTA	Food and Nutrition Technical Assistance III Project
g	gram(s)
GMP	growth monitoring and promotion
FH	Food for the Hungry
IFPRI	International Food Policy Research Institute
IMC	International Medical Corps
IMCI	Integrated Management of Childhood Illness
ISTEEBU	Institut de Statistiques et d'Etudes Economiques du Burundi (Institute of Statistics and Economic Studies of Burundi)
IYCF	infant and young child feeding
kg	kilogram(s)
L	liter(s)
LM	leader mother(s)
LMCG	leader mother care group(s)
MUAC	mid-upper arm circumference
NFP	no food in pregnancy
PAHO	Pan American Health Organization
PHA	provincial health authority(ies)
PM2A	Preventing Malnutrition in Children under 2 Approach
SD	standard deviation
THP	Tubaramure health promoter(s)
USAID	U.S. Agency for International Development
WHO	World Health Organization

1. Introduction

1.1. Background

The Preventing Malnutrition in Children under 2 Approach (PM2A) is a package of health and nutrition interventions aimed at preventing child undernutrition by simultaneously addressing the essential underlying causes of undernutrition. The Tubaramure program, which is being evaluated in this report, is the PM2A program implemented in the provinces of Ruyigi and Cankuzo in Burundi by Catholic Relief Services (CRS), in collaboration with Food for the Hungry (FH), International Medical Corps (IMC), and Caritas-Burundi. The core package of the PM2A includes three main components: distribution of food rations ***(food)***, attendance at preventive health services ***(health)***, and participation in a behavior change and communication (BCC) strategy ***(care)***. These three core components are expected to positively affect maternal and child health and nutrition outcomes through three hypothesized program impact pathways, the ***availability–consumption pathway***, the ***knowledge–use of preventive health care services pathway***, and the ***knowledge–adoption of essential nutrition and hygiene practices pathway***. To understand how the various activities are expected to work together in the Tubaramure program to achieve impact, the International Food Policy Research Institute (IFPRI) together with CRS, FH, IMC, and Caritas-Burundi developed a program theory framework outlining how the primary program components are envisioned to lead from inputs to impact (**Figure 1.1**). More detailed program impact pathways for each of the three primary pathways (described next) were also created and are presented in this report, along with their associated results.

Food component. The food component of the Tubaramure program is expected to increase household availability of micronutrient-rich food and, in turn, consumption of such foods and improved diet diversity (referred to as the ***availability–consumption pathway*** in this report). To achieve these goals, the food component consists of two intervention strategies. The primary intervention strategy is the distribution of a food ration that includes corn-soy blend (CSB) (a micronutrient fortified flour) and oil. The second is an agriculture intervention that includes the provision of agriculture-related training and provision of agriculture inputs (seeds, saplings, and poultry). Both of these interventions are expected to increase the availability of micronutrient-rich foods at the household level, with an emphasis on intake of these foods by pregnant and lactating women, and children between the ages of 6 and 24 months, targeted by the Tubaramure program.

Health component. The health component is designed to improve the provision of preventive health services by health staff and to increase utilization of these services by pregnant and lactating women and children between 0 and 24 months of age (the ***knowledge–use of preventive health care services pathway***). The improved provision and increased utilization of these services are expected to contribute to improvements in maternal and child health outcomes. The Tubaramure program designed this component to strengthen existing health services through the provision of training for health staff, as well as by providing some key supplies for implementing preventive health services. In addition, utilization of preventive health services by pregnant and lactating women (pre- and postnatal services, respectively) and children 0–24 months (growth monitoring and promotion [GMP]) is strongly encouraged by the Tubaramure program through a BCC strategy.

Care component. Tubaramure's BCC strategy was designed specifically to address many of the underlying causes of undernutrition in Burundi and to encourage the adoption of best practices in health, hygiene, and nutrition (the ***knowledge–adoption of essential nutrition and hygiene practices pathway***). The BCC strategy was designed to be implemented by CRS and FH staff members, locally hired Tubaramure health promoters (THP), and leader mothers that are program beneficiaries selected by their fellow beneficiary mothers to teach them. Groups of leader mothers are first trained by the THP during

leader mother care groups (LMCG) in topics related to best practices in health, hygiene, and nutrition. These leader mothers in turn train the beneficiary mothers in beneficiary mother care groups (BMCG) on the topics that they have most recently learned from the THP. All beneficiaries (including leader mothers) are encouraged to adopt optimal health, hygiene, and nutrition practices as part of their participation in the Tubaramure program.

Taken together, these three primary program impact pathways comprise the hypothesized program theory framework that was developed by IFPRI in collaboration with CRS, FH, IMC, and Caritas-Burundi (Figure 1.1). This hypothesized framework and associated program impact pathways were used to identify the primary program components that needed to be in place; the program implementers responsible for each of these components; how the components were intended to be utilized by program beneficiaries; and how, ultimately, the components were expected to contribute to overall program impact on maternal and child health and nutrition outcomes. These hypothetical pathways from program inputs to intended impacts were used to design the process evaluation described in this report. Along each of the three core program impact pathways, this evaluation investigated program delivery; beneficiary utilization of services; and the knowledge, attitudes, and beliefs of both program implementers and beneficiaries, and assessed some key health- and nutrition-related practices among beneficiaries. The results of the process evaluation are presented in the context of the three primary program impact pathways and the overall program theory framework in order to identify potential bottlenecks in program implementation and utilization and to determine if certain components could potentially benefit from being strengthened or modified.

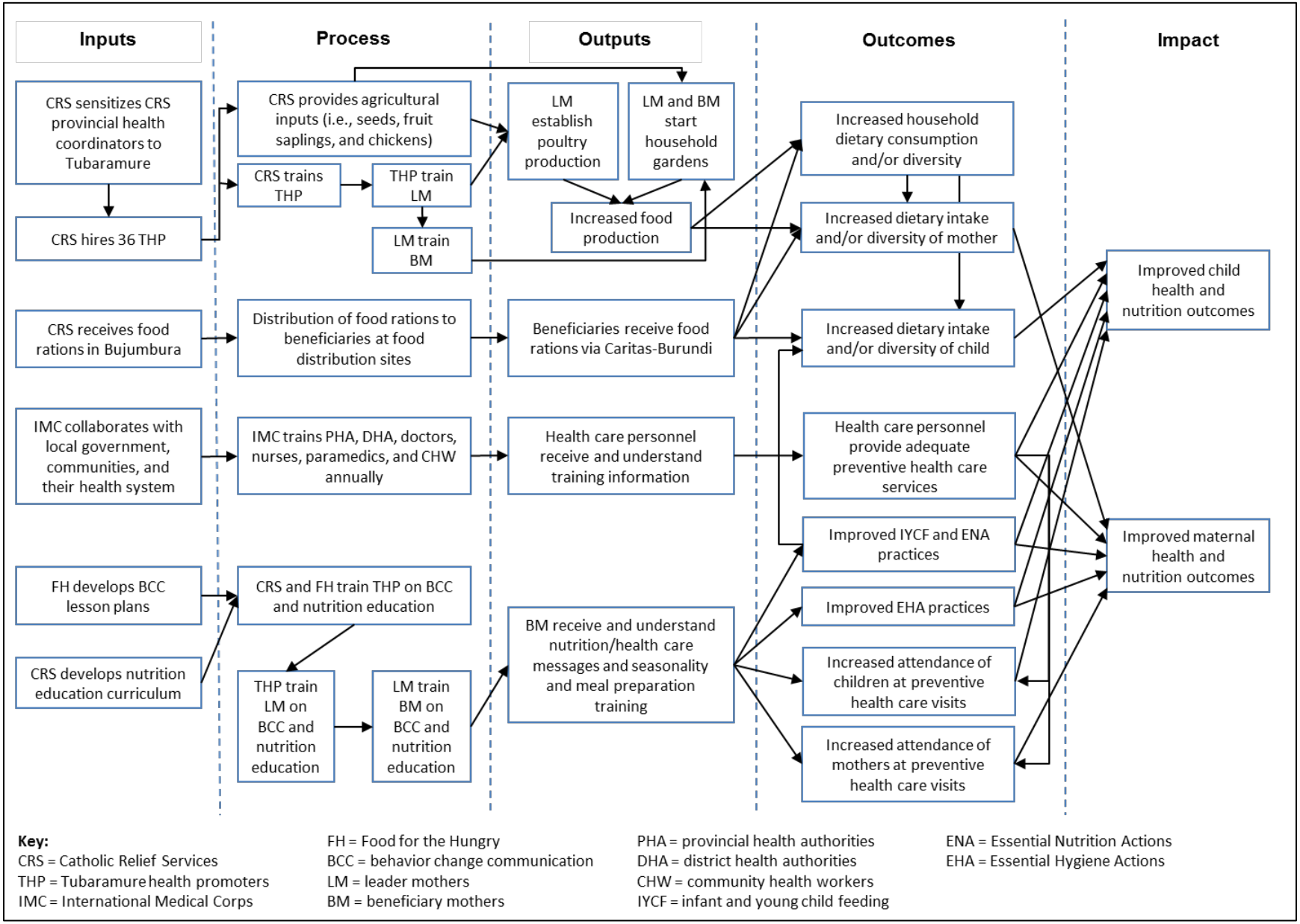
This research was conducted by IFPRI in collaboration with the Tubaramure program consortium members and is part of IFPRI's overall research related to the Tubaramure program. Some of the suggested changes based on the results from this process evaluation will be incorporated into the current Tubaramure program to strengthen specific components and linkages along the three primary program impact pathways and enhance the ability of the program to affect maternal and child nutrition and health outcomes.

1.2. Overall Research Design

The Tubaramure program includes an impact evaluation, two process evaluations, and a cost study. This report provides results from the process evaluation of the delivery and utilization of Tubaramure's primary program components. The *collines* (communities in Burundi)[1] selected to participate in this process evaluation represent all three research groups that were determined by design of the impact evaluation. As part of the impact evaluation that will be conducted, the Tubaramure program includes the following three randomly assigned research groups: (1) Tubaramure-24 (mother receives food rations from pregnancy until the child is 6 months of age, and child between the ages of 6 and24 months of age); (2) Tubaramure-18 (mother receives food rations from pregnancy until the child is 6 months of age, and child between the ages of 6 and 18 months of age); and (3) Tubaramure-NFP (mother receives no food in pregnancy – she receives food rations from the time the child is born until the child reaches 6 months of age, and the child receives rations between the ages of 6 and 24 months). Control groups are not served by the Tubaramure program. General enrollment groups that were not part of the impact evaluation research groups receive food rations for the mother from pregnancy until the child is 6 months of age, and the child between the ages of 6 and 24 months. The impact evaluation will examine the impact of the Tubaramure program on maternal and child health and nutrition outcomes as well as other associated outcomes. In addition, it will examine the differential impact of the timing and duration of participation in the Tubaramure program.

[1] Burundi is divided into provinces, communes, and *collines*.

Figure 1.1. Tubaramure Program Theory Framework



1.3. Organization of the Report

Section 2 of this report presents an overview of the Tubaramure program components under review and the research design and methodology of the process evaluation. Section 3 presents the results according to the three primary impact pathways from inputs to impact, including the program beneficiaries' and staff's perceptions of program organization and management. Section 4 concludes the report with a discussion of findings and offers a set of recommendations that may potentially help improve the quality, implementation, and/or utilization of the primary Tubaramure program components.

2. Methods

2.1. Brief Description of the Tubaramure Program

Tubaramure beneficiaries were originally identified via community sensitization whereby local government officials and *colline* chiefs were informed of the program's activities and eligibility criteria. In turn, these local leaders informed their communities so that pregnant and lactating women could register with their respective THP and enroll in the program. Following the first enrollment event, women were organized into small BMCG within their *colline* and one member was chosen by the group to be the leader mother. After the first enrollment, potential beneficiaries (new pregnancies) were identified by *colline* chiefs and leader mothers and communicated to the respective THP. Potential beneficiaries were given the opportunity to enroll in the program every 2 months between April 2010 and October 2011 in the general enrollment *collines* and every 2 months between December 2010 and June 2012 in the research *collines*. Beneficiaries' participation in the Tubaramure program should consist of: receiving food rations (***food***); attending pre- or postnatal preventive health services and taking their children between 0 and 24 months of age to GMP services (***health***); and participating in bi-monthly BMCG meetings where they receive one lesson per meeting related to nutrition, health, or hygiene (***care***). Detailed descriptions of each of these core components and associated program impact pathways are provided at the beginning of each results section.

2.2. Research Design and Methods

2.2.1. Geographic Area and Study Population

The Tubaramure program operates within Cankuzo and Ruyigi provinces of eastern Burundi. Together, these provinces contain 265 *collines*; 60 *collines* were randomly selected from the total to participate in the impact evaluation of the Tubaramure program, 15 of which are control *collines* (Leroy et al. 2009). Using baseline data, the 45 research *collines* where Tubaramure is being implemented were categorized into six groups based on population size and prevalence of stunting at baseline (Parker et al. 2012). Two *collines* from each of the six combinations of the varying levels of stunting and population size were randomly selected to participate in the process evaluation, for a total of 12 *collines* (**Table 2.1**).

Each of the three research groups (Tubaramure-24, Tubaramure-18, and Tubaramure-NFP) was represented in the sample of *collines* that participated in the process evaluation. The food distribution sites and district health centers that served these *collines* were selected as observation sites for the delivery of food and provision of preventive health services components of the evaluation, respectively (**Table 2.2**). Leader and beneficiary mother care groups were randomly selected from the list of all possible care groups operating within the selected *collines*.

Table 2.1. Selection of *Collines* to Participate in the Process Evaluation Based on Prevalence of Stunting and Population Size

	Prevalence of stunting		
	Highest	**Average**	**Lowest**
Population size > average	n = 2	n = 2	n = 2
Population size < average	n = 2	n = 2	n = 2

Table 2.2. *Collines*, Food Distribution Sites, and Health Centers Selected to Participate in the Process Evaluation by Research Group

Treatment Group	*Colline* number	Food distribution site location	District health center location
Tubaramure-24	1	*Colline* 1	*Colline* 1
	2	*Colline* 2	*Colline* 2
	3	*Collines* 3 and 4	*Colline* 3
	4	*Colline* 5	*Colline* 4
	5	*Colline* 5	*Colline* 5
Tubaramure-18	6	*Colline* 6	*Colline* 6
	7	*Colline* 7	*Colline* 7
	8	*Colline* 8	*Colline* 8
	9	*Colline* 9	*Colline* 9
Tubaramure-NFP	10	*Colline* 9	*Colline* 9
	11	*Collines* 10 and 11	*Colline* 10
	12	*Colline* 7	*Colline* 11

Key informants, including food distribution site managers, nurses, community health workers (CHW), and THP, were identified using purposive sampling methods. Leader and beneficiary mothers were randomly selected to participate in the household interviews within the selected *collines*. Beneficiary mothers were also randomly selected to participate in exit interviews at the BMCG they attended and at preventive health services for pregnant women and children under 24 months of age. Leader mothers were randomly selected to participate in exit interviews following the LMCG they attended. Health promoters that conducted the observed LMCG and the leader mothers that conducted the observed BMCG were also invited to participate in exit interviews following the care group that they had just conducted.

2.2.2. Data Collection Instruments

This process evaluation employed both qualitative and quantitative research methods to generate a comprehensive understanding of program implementation and its utilization among program beneficiaries. The mixed methodology included: (1) structured observations at the food distribution sites and care groups; (2) observations and exit interviews with beneficiaries at food distribution sites, preventive health visits for pregnant women and children under 24 months of age, and care groups; and (3) semi-structured individual interviews with key informants (i.e., site managers, nurses, CHW, and THP) and with leader and beneficiary mothers (**Table 2.3**). Each of the data collection tools is described briefly; the complete instruments will be provided upon request.

Structured observations (combined with exit interviews or semi-structured interviews in some cases). Observations were made at the food distribution sites, care groups, preventive health visits for pregnant women and children under 24 months of age, and participating households. The purpose of the observations was to assess the implementation of the program's core components by program implementers and the utilization and receipt of program components by beneficiaries. Examples of specific aspects that were observed include delivery and availability of commodities at the food

distribution sites, content and conduct of the care groups, interactions between the project implementers and beneficiaries at the various program service delivery points, and implementation of key program recommendations at the household level (e.g., having in place a latrine and handwashing station).

Exit interviews. Exit interviews were conducted with leader and beneficiary mothers. The goals of these interviews were to evaluate the experience of the mothers at the food distribution sites, preventive health visits, and care groups, and to elicit their suggestions for improvements at these key program service delivery points.

Semi-structured interviews. Semi-structured interviews were conducted with key stakeholders, including program implementers and beneficiaries. The goal of the interviews was to evaluate the availability, utilization, and perceived quality of program inputs and services. In addition, stakeholders were asked to suggest ways the program could be improved to make it more accessible and valuable for beneficiaries as well as implementers.

Table 2.3. Summary of Methods Used in the Process Evaluation

Research method	Stakeholder or delivery point	Purpose	Location and sample size
Structured observations	• Food distribution sites • LMCG • BMCG • Preventive health visits for pregnant women and children 0–24 months of age • Households	To assess the implementation, management, flow of activities, time involved in attending services, quality of products and service delivery, and interactions between workers and beneficiaries	• Food distribution site: n = 10 • LMCG: n = 12 • BMCG: n = 24 • Preventive health visits for pregnant women: n = 55 (5 at 11 health centers) • Preventive health visits for children 0–24 months: n = 55 (5 at 11 health centers) • Households: n = 96
Exit interviews with beneficiaries	Beneficiaries at: • Food distribution sites • LMCG • BMCG • Preventive health visits for pregnant women and children 0–24 months of age	To assess the quality of the delivery of the program-related interventions at the food distribution sites, preventive health visits, and care groups To understand the overall experience of beneficiaries in receiving services at the food distribution sites, preventive health visits, and care groups	• Food distribution site: n = 50 (5 at 10 distribution sites) • LMCG: n = 24 (2 at 12 groups) • BMCG: n = 48 (2 at 24 groups) • Preventive health visits for pregnant women: n = 55 (5 at 11 health centers) • Preventive health visits for children 0–24 months: n = 55 (5 at 11 health centers)
Semi-structured interviews	Food distribution site managers	To evaluate the organization of the food distribution process and any problems encountered To elicit their suggestions for improving the process	n = 10 (1 at 10 food distribution sites)

Research method	Stakeholder or delivery point	Purpose	Location and sample size
Semi-structured interviews	THP	To assess the implementation of the BCC component of the program To assess THP health- and nutrition-related knowledge To understand their experiences related to training the leader and beneficiary mothers To elicit perceptions and opinions related to their responsibilities and their ability to do their jobs	n = 10
Semi-structured interviews	Nurses	To assess their understanding of the protocols for the provision of prenatal care and GMP services To assess their participation in health and nutrition training and their related knowledge To understand their perceptions and opinions related to their responsibilities and their ability to perform their jobs	n = 22 (2 at 11 district health centers)
Semi-structured interviews	CHW	To assess their participation in health and nutrition training and their related knowledge To understand their perceptions and opinions related to their responsibilities and their ability to perform their jobs	n = 22 (2 at 11 district health centers)
Semi-structured interviews	Leader mothers at their homes	To assess their participation in the food distribution events, preventive health services, and LMCG To assess their health and nutrition knowledge related to the lessons that should be covered during the LMCG To assess key health and nutrition practices related to the lessons that should be covered during the LMCG and to understand barriers to implementation of optimal practices	n = 24

Research method	Stakeholder or delivery point	Purpose	Location and sample size
Semi-structured interviews	Beneficiary mothers at their homes	To assess their participation in the food distribution events, preventive health services, and BMCG To assess their health and nutrition knowledge related to the lessons that should be covered during the BMCG To assess key health and nutrition practices related to the lessons that should be covered during the BMCG and to understand barriers to implementation of optimal practices	n = 72

2.2.3. Data Collection

The data for the process evaluation were collected between December 2011 and January 2012. The field work was conducted by the Institut de Statistiques et d'Etudes Economiques du Burundi (ISTEEBU) (Institute of Statistics and Economic Studies of Burundi) in collaboration with IFPRI. The field team consisted of local experienced fieldworkers fluent in Kirundi and French. Prior to data collection, extensive training was conducted on general qualitative data collection techniques and on the specific instruments used in the process evaluation. Pilot testing of the semi-structured interviews and observation guides was conducted prior to data collection and revisions were made as necessary. All of the instruments were translated into French and Kirundi and all of the interviews were conducted and recorded in Kirundi. The field team transcribed all of the responses directly into French and used the tape-recorded material as necessary to check completeness and accuracy of recorded responses.

2.2.4. Data Analysis

Quantitative data were analyzed using SPSS version 19 and STATA version 12.1. Qualitative data were coded by grouping similar responses together and looking for common themes among the respondents. Responses from open-ended questions were combined according to common themes. Percentages for stating a particular reason, opinion, or suggestion were calculated either out of the total sample size or of a subset if the question pertained only to people that had or had not been part of the reference activity. The results related to reasons, opinions, and suggestions represent only those that provided a particular response and do not imply that the remaining interviewees were in disagreement with any given reason, opinion, or suggestion.

Results from the quantitative and qualitative data were combined according to major topics and assessed within the context of the primary program components outlined in each of the three primary program impact pathways. Initially, components with a positive response in more than 75 percent of the responses were classified as working well, 25–75 percent as needs improvement, and fewer than 25 percent as not working. If a specific problem or concern was raised by more than a few respondents, that component could be reclassified as needing improvement and/or not working depending on the frequency and/or severity of the problem.

3. Results

The results from this process evaluation are presented in the context of the overall program theory framework, which illustrates how Tubaramure's three core intervention components of ***food***, ***health***, and ***care*** are hypothesized to work in concert toward improving maternal and child health and nutrition outcomes (Figure 1.1). More specifically, the results were analyzed and are presented in the context of the more detailed program impact pathways developed: (1) increased availability of micronutrient-rich foods within the household via increased household production and receipt of food commodities (***availability–consumption pathway***); (2) increased knowledge and use of preventive health services by mothers and children (***knowledge–use of preventive health care services pathway***); and (3) increased knowledge and adoption of essential nutrition and hygiene actions, including infant and young child feeding (IYCF) practices (***knowledge–adoption of essential nutrition and hygiene practices pathway***). Qualitative assessments regarding program components found to be working well and those that needed improvement are also identified and discussed.

3.1. The Availability–Consumption Pathway

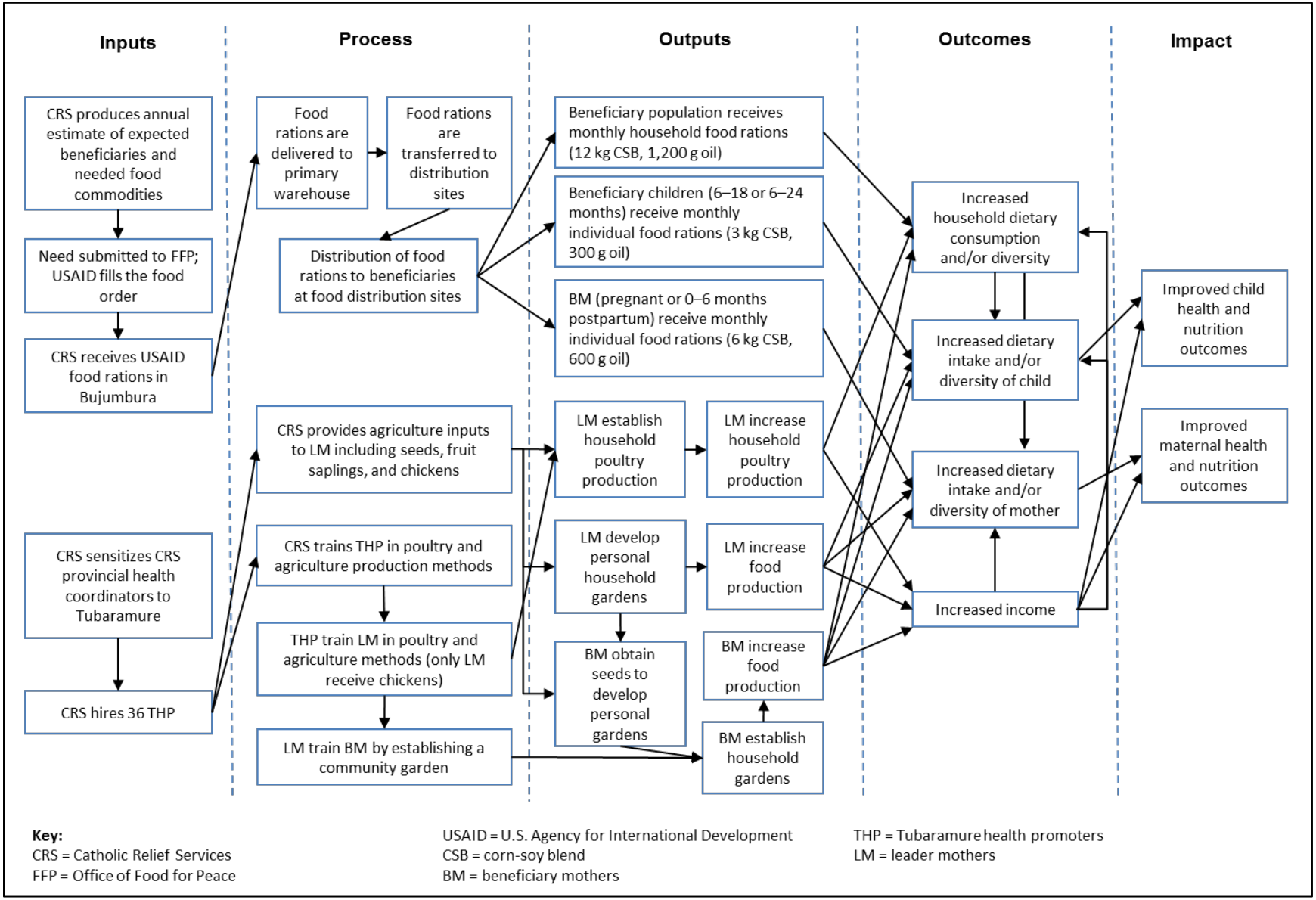
This section examines the first pathway through which the Tubaramure program is expected to increase household availability and consumption of micronutrient-rich food and improve diet diversity through the provision of agriculture inputs for production of micronutrient-rich foods and the provision of micronutrient-fortified CSB and oil. To actualize the ***availability–consumption pathway***, Tubaramure has implemented an agricultural intervention and distributes monthly food rations of CSB and oil (**Figure 3.1**). In this section, results are first presented related to the delivery and utilization of the agriculture intervention and perceived dietary impacts attributed to this intervention. Next, results are presented related to the delivery and utilization of the food commodities provided through the Tubaramure program and perceived dietary impacts related to that component. Lastly, the program components along this pathway that were identified as working well and those that needed some improvement are summarized, including suggestions on how to modify or strengthen these program components.

3.1.1. Description of Tubaramure's Agriculture Intervention

The primary program components related to the agriculture intervention include the provision of agriculture training for the THP, leader mothers, and beneficiary mothers, and provision of agriculture inputs for leader mothers and beneficiary mothers. Specifically, according to the design of the program, CRS is supposed to provide the THP with agriculture-related training. The THP in turn train their respective LM on these same agriculture techniques and at the same time CRS provides them with agriculture inputs. Leader mothers are expected to receive training on three separate agriculture topics: planting vegetable seeds, planting fruit trees, and breeding hens.

When trained, leader mothers must transfer this information to their respective beneficiary mothers during BMCG. Leader mothers are expected to train their respective beneficiary mothers on the agriculture techniques they learned about in their LMCG. Although it was not officially part of the original design of the agriculture intervention, some THP also proposed the idea for leader mothers to develop community gardens with their BMCG as a teaching tool.

Figure 3.1. Tubaramure Program Theory Framework Related to the Availability–Consumption Pathway



The agriculture inputs chosen for distribution by CRS included vegetable seeds (red onions, white onions, amaranth, leeks, cabbage, and eggplant), fruit trees (mango, papaya, avocado, and passion fruit), pineapple plants, and chickens. Each leader mother was given at least three sachets of vegetable seeds (5 g each); the most vulnerable beneficiary mothers also received some vegetable seeds from the program. Due to budgetary constraints, fruit trees and chickens were to be distributed only among leader mothers. Leader and beneficiary mothers were encouraged to use these agriculture inputs, along with the training they received, to create a new home garden or to improve an existing one.

Unfortunately, the implementation of the agriculture intervention among the *collines* participating in the research was delayed and did not start until January 2012. Therefore, at least half of the leader and beneficiary mothers in the study sample were not expected to have received agricultural training or the inputs.

3.1.2. Results Related to Tubaramure's Agriculture Intervention along the Availability–Consumption Pathway

Provision of Agriculture-Related Training and Inputs

CRS Trains Tubaramure Health Promoters

The health promoters received a weeklong training in October 2010 on techniques for planting vegetables and fruit trees and for breeding hens from CRS's national technical advisor for food and nutrition and a consultant hired from the Ministry of Agriculture. During the training, each THP was given two detailed manuals and instructions on how best to train leader mothers on agriculture and poultry-rearing techniques.

Leader and Beneficiary Mothers Receive Agriculture-Related Training

Due to a delay in the implementation of the agriculture intervention, fewer than half of the leader and beneficiary mothers received at least one agriculture training session at the time of the process evaluation (**Table 3.1**). The leader mothers that had received any agriculture-related training reported having received between 1 and 6 sessions, with an average of 3.6 sessions, slightly more than what was required by the program design. Beneficiary mothers that had received any training reported receiving between 1 and 5 sessions, with an average of 2.2.

Leader and Beneficiary Mothers Obtain Inputs to Develop Personal Gardens

At the time of this evaluation, the majority of the leader mothers had received seeds from Tubaramure, but only two of them had received chickens. Only a minority of beneficiary mothers had received seeds. One had received chickens even though the program had not intended for beneficiary mothers to receive chickens (Table 3.1).

Leader and Beneficiary Mothers Establish Community and Home Gardens

Of the 24 leader mothers interviewed, 5 reported having planted a community garden since the start of Tubaramure (Table 3.1). While more than half of the leader mothers sampled had home gardens, they were largely planted prior to the Tubaramure program and only a few of the leader mothers said that they had used any agriculture inputs toward establishing or improving their home gardens. In contrast, fewer than half of the beneficiary mothers had home gardens, but most were new or had been improved since joining the program. Surprisingly, only a few beneficiaries mentioned using inputs received from the Tubaramure program to establish or improve their home gardens.

Table 3.1. Agriculture Training, Inputs, and Garden Development among Beneficiaries Sampled[i]

	Leader mothers (n = 24)	Beneficiary mothers (n = 72)
Agriculture training		
Participated in training	11 (46%)	27 (38%)
Of those that participated, average number of training sessions received	3.6 (1.6)	2.2 (1.2)
Agriculture inputs		
Received seeds	17 (71%)	11 (15%)
Received chickens	2 (8%)	1 (1%)
Garden establishment		
Had a community garden	5 (21%)	0 (0%)
Garden new since joining Tubaramure	5 (100%)	0 (0%)
Had a home garden	13 (54%)	29 (40%)
Garden new since joining Tubaramure	5 (38%)	20 (69%)
Reported using inputs provided by Tubaramure	3 (23%)	3 (10%)

[i] Numbers are presented as n (%) or mean (standard deviation [SD]).

Perceived Changes in Dietary Patterns among Leader and Beneficiary Mothers as a Result of the Agriculture Intervention

Among leader and beneficiary mothers that had received agriculture inputs, such as seeds or chickens, about half said that they thought these inputs had improved their own diets or that of their household in general (**Table 3.2**). As explained by one beneficiary, "We are eating vegetables now; before we ate food without vegetables." About one-third of the beneficiaries also thought that their children's diets had changed as a result of receiving these inputs. Those that reported changes in their children's diets explained that their children's vegetable intake had increased (6/11), that their diet quality improved (4/11), and that they were receiving better nutrition as a result of receiving these inputs (2/11). One beneficiary mother said, "He takes the nutrients contained in the vegetables which guarantee him good health."

Table 3.2. Perception of Impact of Agriculture Inputs on Diet Changes among Households, Children, and Mothers That Received Agriculture Inputs[i]

Dietary impacts	Leader mothers (n = 16)[ii]	Beneficiary mothers (n = 17)[ii]	All mothers (n = 33)[ii]
Household diet has changed	8 (50%)	7 (41%)	15 (45%)
Mother's diet has changed	7 (50%)[iii]	7 (41%)	14 (45%)[iv]
Child's diet has changed	6 (43%)[iii]	5 (29%)	11 (35%)[iv]

[i] Numbers are presented as n (%).
[ii] Maximum sample sizes are presented.
[iii] n = 14.
[iv] n = 31.

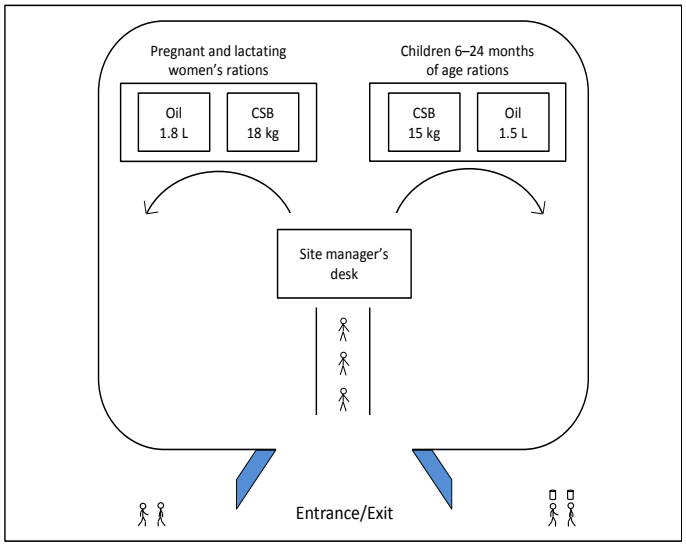
3.1.3. Description of Tubaramure's Food Distribution Process

The distribution of U.S. Agency for International Development (USAID) food commodities to the beneficiary population begins with the arrival of CSB and oil in Burundi. The food commodities must then be distributed to each of the food distribution sites in the provinces of Cankuzo and Ruyigi from where they are distributed to the beneficiaries.

Tubaramure staff members determine the dates that each food distribution site will be open for distribution. The total number of distribution days for a site depends on the total number of beneficiaries to be served within the site's catchment area. Together, the site manager and THP decide on the *collines* that will be served each day; the THP must then inform each *colline* of its respective distribution days. Health promoters are also responsible for compiling an updated beneficiary list every month with the names of all Tubaramure program participants, arranged by *colline* and BMCG.

The beneficiary list is then used to determine women's eligibility and the size of their food ration. The size of the rations is determined by the BMCG category: pregnant women and women 0–6 months postpartum receive 18 kg of CSB and 1.8 L of oil, and mothers with children between the ages of 6 and 24 months receive 15 kg of CSB and 1.5 L of oil. The criteria for being eligible to receive food rations are that a beneficiary's name must appear on the beneficiary list and she must present her ration card, CSB bucket, and oil bottle.

Figure 3.2. CRS Food Commodities Unit Diagram



To streamline the distribution process, beneficiaries enter the food distribution line by BMCG. Beneficiaries first pass the site manager's desk where the four criteria for receiving rations, mentioned previously, are checked. If all four criteria are satisfied, a beneficiary's ration card is stamped to indicate ration receipt for that month. The beneficiaries then separate by BMCG and split into two lines to approach their designated distribution table (**Figure 3.2**).

Each food distribution site should have approximately eight permanent site workers, and can additionally hire day workers as needed to help with the weighing, measuring, and ration distribution process. Every site must be equipped with scales and graduated cylinders to measure the amounts of CSB and oil, respectively. To distribute CSB, the beneficiary's empty yellow bucket is placed on the large scale and CSB is carefully scooped out of the commodity bag into the bucket until the appropriate weight is reached. To distribute oil, large USAID oil cans are opened using a can opener that creates a small slit-like opening, which is ideal for pouring out oil but not ideal for returning excess amounts. Once the USAID oil cans are opened, oil is poured into a graduated cylinder according to the beneficiary's oil ration. Once the correct ration is measured in the graduated cylinder, the oil is then poured into the beneficiary's oil container. CSB and oil must be inspected by the site manager (or site workers) to determine if it is fit for distribution (i.e., valid expiration date, appropriate color, no visible

mold, and no insects). Once each care group member has received her rations, the leader mother must sign a distribution list to confirm the correct amount was received by each member.

3.1.4. Results Related to the Food Distribution Process along the Availability–Consumption Pathway

Distribution of Food Rations to Beneficiaries at Food Distribution Sites

Food Distribution Site Management

At the start of Tubaramure, Caritas-Burundi signed a contract with a local parish (church) in each area chosen to distribute food. The priest of the local parish was then charged with choosing a local person to manage the site for the duration of Tubaramure. Nine site managers were hired to manage the 10 food distribution sites that were evaluated, which includes one site with an affiliated mobile site. About half of the site managers interviewed had more than 1 year of experience with the Tubaramure program (5/9, 56%), three were appointed within the previous 6 months (3/9, 33%), and the remaining site manager could not remember the date of his appointment (1/9, 11%). All site managers interviewed reported having received some job-specific training. Topics included management of food distribution events (6/9, 67%), providing assistance and respect to beneficiaries (5/9, 56%), ration quantities (4/9, 44%), storeroom maintenance (4/9, 44%), stock inventory (4/9, 44%), hygiene (i.e., food and equipment) (4/9, 44%), Tubaramure program objectives (3/9, 33%), report writing (2/9, 22%), and use of the beneficiary inventory list (2/9, 22%).

Most site managers (8/9, 89%) believed that they were prepared to perform their duties, stating so because of their motivation (6/9, 67%), training (2/9, 22%), ability to work well with supervisors (2/9, 22%), previous experience and abilities (2/9, 22%), and desire to help others (2/9, 22%). However, most (8/9, 89%) explained that they would benefit from continuous training (5/9, 56%); receipt of sufficient work materials, such as soap and distribution tools (3/9, 33%); and secure employment (2/9, 22%). One site manager did not feel well prepared to perform duties due to lack of experience with food distributions.

Interactions between Food Distribution Site Managers and Staff

An average of 7.3 (standard deviation [SD] 2.8) permanent staff and 7.2 (SD 3.0) day laborers worked at the 10 sampled food distribution sites. None of the site managers had experienced any problems with their permanent staff or day laborers during the previous 4 months. Additionally, none of the site managers reported any problems with other distribution site workers, nor were there problems reported between the distribution site workers and the beneficiaries attending the distribution at which they were interviewed.

Food Distribution Site Locations, Materials, and Organization

Food distribution events were held at outdoor venues located on parish premises (6/10, 60%), outside schools (2/10, 20%), or at a rented venue near the local market (1/10, 10%); one distribution event was held inside a school (1/10, 10%). All sites had a roof structure to protect the rations from rain and most were described as clean by the observers (one site had some evidence of feces). Most sites (8/10, 80%) had seating available for beneficiary mothers. Although beneficiary mothers made use of the seating provided, there were always empty spaces where women could sit (**Table 3.3**). Most site managers perceived the current site location to be appropriate (9/10, 90%), three of whom said that the site provided sufficient shelter to protect the food and beneficiaries, two said that it was a large enough area and that there were no disturbances at the site, one said that the space was contained (closed) to ensure beneficiaries could be served in order of arrival, and another noted the covered seating area. The only reason provided by the site manager who was dissatisfied with the location of the site was that the space was too narrow.

Table 3.3. Observation of the Food Distribution Site[i]

	Food distribution site (n = 10)
Observations of environment	
Distributions conducted outdoors	9 (90%)
Sites with a clean outdoor environment	9 (90%)
Sites with visible human/animal feces	1 (10%)
Sites with a roof to protect food rations from rain	10 (100%)
Sites that provide seating for beneficiaries	10 (100%)
Observations of materials	
Sites that had beneficiary lists	10 (100%)
Sites with scale to weigh CSB	10 (100%)
Sites with graduated cylinders to measure oil	10 (100%)
Observations of organization	
Sites with separate lines for pregnant and lactating women (0–6 months postpartum) and for mothers with children 6–24 months of age	2 (20%)
Sites with one line	1 (10%)
Sites that used both one and two lines	7 (70%)

[i] Numbers are presented as n (%).

Nearly 80 percent of beneficiaries considered the location of their food distribution site to be a good location. Being well covered (mentioned by 46%) and clean (mentioned by 41%) were the most important reasons given. Of the 11 beneficiaries that were dissatisfied with their site location, 9 said it was because the area was not well covered, although all sites at least had roofs to cover the commodities. According to one respondent, "There is no overhead structure so when it rains, it's hard to continue the distribution." Another woman said that, "There is no area where we can take shelter." Lack of cleanliness and the far distance were other complaints, each mentioned by three beneficiaries.

Over the course of the last four distributions, the most commonly reported problem had to do with rainfall, either with people not being able to attend the distribution because of rain or because there was not sufficient roof covering to protect the food and beneficiaries from rain. Half of the site managers reported having had problems with rain at one of the past four distributions (5/10, 50%). One site manager also mentioned having had problems with theft at least once over the course of the past four distributions and another with rations that were already expired before arriving at the site. To minimize the impact of rain on the distribution event, site managers suggested constructing solid roof coverings (3/10, 30%) or having authorities locate a better site where there is shelter (1/10, 10%).

All of the food distribution sites observed had scales to weigh the CSB and cylinders to measure the oil. Although the quantities of oil to be distributed are cited in kilograms, the actual distribution of oil relied on measures in liters. All sites had a list of beneficiary names expecting to receive rations during the observed distribution. All sites reported that their beneficiary list was updated every month and provided by the THP approximately 2.8 (SD 1.5) days prior to the distribution event, which, on average, is earlier than the 2 days required by the program. Across the 10 sites, 9 sites used two separate ration lines for at

least part of the distribution process; among these 9 sites, the majority (7/9, 78%) also used the one ration line system for part of the distribution process (Table 3.3). Although all of the sites observed had beneficiary lists and generally received them on time, the majority of site managers stated that they had experienced problems with these lists (6/10, 60%), such as registered participants missing from the list or that they received the incorrect quantity (4/6, 67%) and delayed receipt of the list (2/6, 33%).

In the event that a beneficiary's name was absent from the list or an incorrect ration quantity had been assigned to her, site managers reported often correcting such problems with the THP at the time of the distribution (3/4, 75%) or, alternatively, refusing service until the problem could be resolved (1/4, 25%). One site manager also explained that he had started viewing the prenatal health cards of pregnant women to confirm eligibility.

Timeliness of Operations at Food Distribution Sites

On average, each food distribution site serves about 2,000 beneficiaries per month and an average of 431 beneficiaries on the distribution day observed (**Table 3.4**). On average, the distribution on the day of the interview started at 8:24 am. Three of the 10 sites reported the day's start time to be their usual time. Reasons for the delayed start time in 7 of the 10 sites were tardy beneficiaries (6/7, 86%), beneficiaries being informed late (3/7, 43%), and a delayed delivery truck (1/7, 14%).

Table 3.4. Population Served at Food Distribution Sites[i]

	Food distribution sites (n = 10)
Population served	
Collines served (per site)	14.3 (8.2)
Days per month open for distribution (per site)	6.3 (5.2)
Beneficiaries to receive rations during the month of observation (per site)	1,946 (1,004)
Beneficiaries to receive rations on the day of observation (per site)	431 (86)
Beneficiary attendance (of the last four distributions)	
Sites that reported beneficiaries had arrived on the wrong day or at the wrong time	6 (60%)
Distribution events at which beneficiaries arrived at the wrong time or on the wrong day (at six sites with late arrivals)	2.2 (1.5)
At the last occurrence, proportion of beneficiaries that came to the distribution site at a different day or time than planned (at six sites with late arrivals)	14.2 (22.6)

[i] Numbers are presented as n (%) or as mean (SD).

As intended by the program design, the date and time of most (8/10, 80%) food distribution events were communicated to program participants via the THP. Multiple communication methods were used by the THP to notify beneficiaries. Seven sites used the church (via news and announcements), three used the local market, three relied on the *colline* chief, and one used local bars and health centers in addition to churches and markets.

Notwithstanding the multiple communication channels, six of the food distribution sites observed had received beneficiaries on the wrong day or at the wrong time over the last four food distribution events;

among these six sites, this problem had occurred at two of the past four distributions and the last time it occurred, site managers estimated that about 14 percent of the recipients had arrived on the wrong day or at the incorrect time (Table 3.4). Two site managers stated that they advised such beneficiaries to respect their appointments, three made them wait until after (the others) to be served, and two gave the beneficiaries another appointment. Two site managers explained that beneficiary or leader mothers that arrive early are made to wait for their respective care group members before receiving their rations.

Beneficiaries Receive Food Rations at Food Distribution Sites

Understanding of Beneficiary Category

Of the 50 beneficiaries interviewed at the food distribution sites, 7 (14%) were pregnant or lactating (i.e., had a child under 6 months of age) and 43 (86%) had a child between the ages of 6 and 24 months. Among the pregnant and lactating women surveyed, about half correctly responded that the mother was the primary beneficiary; the others thought that it was both the mother and the child. Among the mothers of children between 6 and 24 months of age, the majority (25/43, 58%) correctly responded that the child was the primary beneficiary; about one-third (15/43, 35%) incorrectly responded that the mother was the primary beneficiary; two (5%) said that both the mother and the child were the primary beneficiaries; and one said that the mother, the child, and the family were the primary beneficiaries.

Beneficiaries Inputs to Receive Food Rations

All the sampled beneficiaries came to the observed food distribution sites prepared with their CSB bucket, oil bottle, and ration card. There were no negative opinions on the use of the ration cards. The majority of the women reported that the ration cards were the best way to identify program beneficiaries (35/50, 70%), one-third said that ration cards helped identify people that wrongfully claim to be in the program (17/50, 34%), and another third said the cards were helpful because they show the quantity each beneficiary receives (19/50, 38%). Site managers also had positive opinions of the ration card system for similar reasons.

At the last four distributions (past 4 months), four of the sites had received beneficiaries seeking rations without ration cards at least once. At these four sites, only an estimated 5 percent of beneficiaries had arrived without a ration card. Three site managers reported that they explained to beneficiaries that they could not distribute rations to anyone without a ration card and that the beneficiaries needed to ask their THP for a replacement ration card. However, one site manager explained that he could distribute rations if the missing ration card was reported. When asked how to improve the current method of managing beneficiaries without ration cards, two of the four site managers suggested immediately replacing the ration card, one explained that it was not within the manager's jurisdiction to change the process, and the other said there was no other method.

Time Spent Traveling to Food Distribution Sites and Collecting Food Rations

Nearly all of the beneficiaries interviewed at the food distribution sites (45/50, 90%) were satisfied with the distribution time. About half of those that were satisfied said that they were able to return home early (21/45, 47%); some said that the time of the distribution gave them time to prepare meals at home (11/45, 24%); and some mentioned that the distribution was held on a convenient day, such as a weekend or a day that doesn't coincide with a market day (6/45, 13%). Among the five dissatisfied beneficiaries, three were dissatisfied because they were given too early an appointment time and two said that they had to give up work.

Beneficiaries estimated traveling approximately 2 hours to reach their respective food distribution sites (**Table 3.5**). As indicated by the travel time estimates, long distances were covered between beneficiaries'

homes and their respective sites. During the 4 months prior to this survey, most of the beneficiaries made their site trips by foot (334/380, 88%) and only a minority of trips were made by bicycle (34/380, 9%) or public transportation (12/380, 3%). Only a small number of program recipients were able to access public transportation (4/95, 4%). Whether walking or on a bicycle, all but one beneficiary said that they faced no problems reaching their site.

Beneficiary mothers were observed to assemble into their BMCG before joining the food distribution line. On average, beneficiaries were observed to have waited in line for almost 1 hour before receiving their food rations. The average total amount of time spent by a beneficiary at the site (i.e., time spent waiting for care group members and waiting in the food ration line) was almost 2.5 hours. The total amount of time varied by site. At half of the sites, total time was less than 2 hours; at one site, however, recipients spent an average time of more than 4 hours (Table 3.5).

Overall, most of the beneficiaries thought that the time they spent at the food distribution site was acceptable and went by fairly fast (30/50, 60%). As stated by one beneficiary, "Taking into account the hour I arrived and the [number] of beneficiaries served at this site, the time I spent here is all right." However, about one-third of the beneficiaries did think that the distribution process took too long (16/50, 32%). Of these, three-quarters complained about a long wait (12/16, 75%), appointment times not being respected (1/16, 6%), and having to wait on fellow beneficiary mothers from their BMCG before they could be served (2/16, 13%).

Notwithstanding the potentially large time commitment to participate in the food distributions, only a small proportion of the women interviewed reported that attending the distribution days interfered with their usual activities (7/50, 14%), including work in the fields (5/50, 10%), preparing meals for their children or families (4/50, 8%), child care (2/50, 4%), and household work (2/50, 4%). Two women reported having to have their children do the work they couldn't do (4%). One of these women stated that she had to make a child skip school to watch her younger child.

Table 3.5. Time Commitment for Beneficiaries at the Observed Food Distribution Site[i]

	Beneficiaries at site (n = 50)
Total time spent traveling to the site on the day of observation	2 hr 02 min (1 hr 02 min)
Total time spent waiting in the commodity line	57 min (1 hr 07 min)[ii]
Total time spent at the site on the day of observation	2 hr 20 min (1 hr 35 min)[ii]

[i] Numbers are presented as mean (SD).
[ii] n = 39.

Beneficiaries Receive Food Rations

On the observed distribution days, all food distribution sites distributed CSB and oil. None of the observed sites ran out of CSB or oil before the last beneficiary received her ration. Ration cards were stamped and rations were measured during distribution.

Quantity of Corn-Soy Blend and Oil Received

Five beneficiary mothers incorrectly received the larger 18 kg CSB ration size; none incorrectly received the smaller 15 kg CSB ration. All pregnant or lactating women correctly received the large oil ration; interestingly, almost all mothers of children between 6 and 24 months of age (37/43, 86%) received the large oil ration as well. Receipt of the large oil ration may have been caused by the inability to return

excess oil to the original USAID oil can. On average, beneficiary mothers received an additional 0.39 L (SD 0.19) of oil.

Quality of Corn-Soy Blend and Oil Being Distributed at Observed Food Distribution Sites

At half of the sites, all five CSB bags sampled for quality tests lacked an expiration date. However, these 25 bags of CSB were still deemed fit for distribution by the site managers (**Table 3.6**). At the remaining sites, all CSB bags sampled had valid expiration dates. The observers saw no insects or mold present in any of the 50 CSB bags sampled. At one site, two of the five bags exhibited an abnormal color. At all sites, the oil cans displayed valid expiration dates and none exhibited an abnormal color (Table 3.6). Fieldworkers reported that at two of the sites some bags of CSB were put off to the side to avoid distribution to the beneficiary population. These CSB bags were deemed unfit for distribution because they had expired or were infested with insects.

Table 3.6. Observations of Food Commodities Being Distributed at Food Distribution Sites[i]

Observations of food commodities	5 bags sampled at 10 sites (n = 50)
CSB bags lacking an expiration date	25 (50%)
CSB being distributed that was infested with insects	0 (0%)
CSB being distributed that was discolored	2 (4%)
CSB being distributed that was moldy	0 (0%)
Oil bottles lacking an expiration date	0 (0%)
Oil being distributed that was expired	0 (0%)
Oil being distributed that was discolored	0 (0%)

[i] Numbers are presented as n (%).

Interactions between Food Distribution Site Staff and Beneficiaries

The beneficiaries' interactions with the site workers were largely positive. The vast majority of the beneficiaries reported that they felt respected by the workers (44/50, 88%). Of these, two-thirds emphasized feeling respected by the staff as a result of receiving the correct quantity of their rations (30/44, 68%). Some beneficiaries also mentioned that they feel respected by the welcoming behavior of the site workers (11/44, 25%). It is important to note, however, that half of the beneficiaries that felt respected (22/44, 50%) reported feeling respected on the day the interviews were conducted, but that this was not always the case. One respondent said that she "felt respected on that specific day because the workers did not maltreat [the beneficiary mothers], manhandle them, or insult them." Nine women claimed that they were respected on the day the interviews were conducted because the staff knew that there were visitors. As stated by one woman, "Today there are no clashes between the workers of Tubaramure and the beneficiaries because of the visitors." The one beneficiary that reported having a problem with staff on the day of the interview said that she was forced to wait even longer for her food rations because she had stepped out to get water when her BMCG was called. Of all 50 women, only a few (6/50, 12%) did not feel respected by the distribution site workers. Interestingly, five of the six women that did not feel respected were interviewed at the same site, which means that every single woman (5/5, 100%) interviewed at this site replied that she did not feel respected by the staff. When asked about the interaction between staff and beneficiaries, none of the site managers reported any problems on the days of the observations.

Attendance at Food Distributions over the Past 4 Months by Beneficiaries Interviewed at Home

CSB and oil were received by everyone at every distribution event attended over the past 4 months. The only participant who had not yet participated in a food distribution event was pregnant and living in a Tubaramure-NFP *colline*. In general, personally missing a food distribution event for any cause was a rare occurrence and happened only when faced with illness (3/95, 3%). In this situation, the Tubaramure program allows every woman to send a replacement person to collect the rations on her behalf, and each of the beneficiaries who reported illness mentioned having made use of this policy.

Perceptions of the Quantity of Corn-Soy Blend and Oil Received over the Past 4 Months by Beneficiaries Interviewed at Home

Although all beneficiary and leader mothers received a CSB and oil ration at each of the distribution events attended, some believed that they had received the wrong quantity of CSB at least once (12/95, 13%) and a few reported receiving the wrong quantity at every distribution (3/95, 3%). The same proportion of beneficiaries had complaints with regard to the quantity of oil received at the last four distributions.

Perceptions of the Quality of Corn-Soy Blend and Oil Received over the Past 4 Months by Beneficiaries Interviewed at Home

More than one-third of beneficiaries (35/95, 37%) reported having experienced a problem with CSB quality over the last 4 months. The majority of those with perceived quality issues reported it from only one of the past four distributions (31/35, 89%). The majority of the problems reported had to do with an off-taste of the CSB (28/35, 80%). Other less common problems regarding the CSB quality included presence of bugs, presence of seeds or stones, or a bad odor. It is possible that these reported problems were due to storage conditions at home. Perceived problems with the oil were much less common. Only one beneficiary mother reported a problem (taste and consistency) with the oil she received on two occasions over the past 4 months.

Site Manager Opinions of Quality at Food Distributions over the Past 4 Months

One site manager reported problems with CSB quality in the 4 months preceding the study. This problem was contained to only one occasion when some of the CSB was reportedly spoiled before reaching the warehouse due to heavy rains. The site manager suggested avoiding this problem in the future by having the program deliver only food rations that are in good condition. None of the sites had experienced problems with oil over the past 4 months. None of the site managers reported experiencing problems with the storage of CSB or oil during the past 4 months.

Non-Beneficiaries Attempting to Receive Food Rations over the Past 4 Months

During the past 4 months, four of the food distribution sites experienced at least one non-beneficiary attempting to receive food rations. The two site managers that could estimate the number of non-beneficiaries that tried to receive food rations reported an average of seven non-beneficiaries. To manage this issue, site managers informed non-beneficiaries that the Tubaramure program served only registered beneficiaries that have met specific eligibility criteria (2/4, 50%), that non-registered women could not receive food rations (2/4, 50%), and that they could consult with the THP to determine eligibility (1/4, 25%). Three of the site managers that had experienced this problem (75%) responded that the current process for dealing with non-beneficiaries could not be changed; the remaining site manager suggested taking actions to sensitize the community and posting signs to indicate that non-beneficiaries are prohibited from entering the food distribution site.

Perceptions of the Food Distribution Process by Beneficiaries Interviewed at the Food Distribution Sites

All the beneficiaries (50/50, 100%) liked participating in the distribution. Reasons given were related to receiving the food rations (31/50, 62%), having run out of the previous month's rations (12/50, 24%), the nutritious quality of CSB (7/50, 14%), and because their children like to eat CSB (2/50, 4%). A few women were happy to participate in distributions because, as stated by one woman, it allowed them to "meet up with other beneficiaries that are friends" (3/50, 6%).

The majority of women were generally encouraged by their spouses to go to the food distribution site, and the husbands valued the food received as part of their wives' participation in the program, both for nutrition and economic reasons. Some women also said that their husbands specifically encouraged them to go by reminding them of the distribution day, waking them up in the morning, or relieving them of their other household duties (7/50, 14%). As one woman said, "He told me not to do any other work." A few of the beneficiaries reported that their husbands also provide help by watching the kids while the women go to get the food, by sending someone to help the women carry the food rations, or by going themselves with their wives to pick up the food (4/50, 8%).

The majority of the women (40/50, 80%) were pleased with how the distribution went and all but one of them planned on participating in the next distribution (49/50, 98%). The top reasons mentioned for motivating them to attend the next food distribution included to receive food rations (14/50, 28%) and because the CSB improves the health of their children (14/50, 28%). One woman said, "My children are able to study well when they eat some bouillie [porridge] made from CSB in the morning."

Suggestions on How to Improve the Food Distribution Events

About one woman per observed food distribution site (10/50, 20%) said that if some things were different their experience receiving their food rations would have improved. Things that could be improved from the beneficiaries' perspectives were availability of transportation for them to take their rations home (3/10, 30%), not having to wait for all of the mothers in their BMCG (2/10, 20%), and having child care provided while they are at the food distribution site (1/10, 10%).

Use of Food Rations

Ration Consumption

Most beneficiaries surveyed understood that the food rations were primarily intended for consumption by the mother and the beneficiary child between the ages of 6 and 24 months (**Table 3.7**). Only minor differences existed between the beneficiary and leader mothers' responses.

Table 3.7. Beneficiaries' Understanding of Who Is Intended to Eat the Tubaramure Food Rations[i]

Intended recipient	Leader mothers (n = 24)	Beneficiary mothers (n = 71)	All mothers (n = 95)
Mother	22 (92%)	68 (96%)	90 (95%)
Husband	12 (50%)	47 (66%)	59 (62%)
Beneficiary child between the ages of 6 and 24 months[ii]	19 (95%)[iii]	47 (90%)[iv]	66 (92%)[v]
Other children	17 (71%)	54 (76%)	71 (75%)
Other household members	0 (0%)	9 (13%)	9 (9%)
Does not know	0 (0%)	0 (0%)	0 (0%)

[i] Numbers are presented as n (%).
[ii] Only families with a beneficiary child between the ages of 6 and 24 months of age were included in this question.
[iii] n = 20.
[iv] n = 52.
[v] n = 72.

As would be expected from their understanding of the intended recipients of the CSB, rations were consumed by nearly all of the beneficiary mothers and children (**Table 3.8**). Other household members also ate the CSB, as would also be expected. One practice of concern is that some of the women that had children under 6 months of age were giving those children CSB and oil, which is contrary to the recommendation promoted by the Tubaramure program that children should be exclusively breastfed for the first 6 months of life. Mothers typically dictated how the Tubaramure rations were used within the household; in approximately one-tenth of the households, fathers controlled how the rations were consumed.

Table 3.8. Household Members That Reportedly Eat the Tubaramure CSB and Oil Rations[i]

	Leader mothers (n = 24)	Beneficiary mothers (n = 71)	All mothers (n = 95)
CSB			
Beneficiary mother	24 (100%)	68 (96%)	92 (97%)
Child 0–6 months of age[ii]	0 (0%)[iv]	4 (22%)[vi]	4 (19%)[viii]
Child 6–24 months of age[iii]	20 (100%)[v]	48 (92%)[vii]	68 (94%)[ix]
Other household members	20 (83%)	52 (73%)	72 (76%)
Relatives	3 (13%)	3 (4%)	6 (6%)
Oil			
Beneficiary mother	24 (100%)	68 (96%)	92 (97%)
Child 0–6 months of age[ii]	0 (0%) [iv]	4 (22%)[vi]	4 (19%)[viii]
Child 6–24 months of age[iii]	20 (100%)[v]	46 (88%)[vii]	66 (92%)[ix]
Other household members	20 (83%)	53 (75%)	73 (77%)
Relatives	0 (0%)	2 (3%)	2 (2%)

[i] Numbers are presented as n (%).
[ii] Only households with a child between the ages of 0 and 6 months were included in this response.
[iii] Only households with a child between the ages of 6 and 24 months were included in this response.
[iv] n = 3.
[v] n = 20.
[vi] n = 18.
[vii] n = 52.
[viii] n = 21.
[ix] n = 72.

Intake and Use of Corn-Soy Blend and Oil

The vast majority of beneficiary mothers and children between the ages of 6 and 24 months ate CSB in the previous 24 hours. The majority also reportedly ate oil in the previous 24 hours (**Table 3.9**). Although CSB and oil can both be added to a variety of recipes, beneficiaries typically used the CSB and oil to prepare porridge (89/95, 94%) eaten primarily by themselves and their children 6–59 months of age. Approximately one-tenth (12%) of the households added CSB to amaranth dishes. A couple of respondents said that they incorporated CSB into dishes using small fish (such as sardines) and fruit dishes (such as bananas and pineapples). There was little difference in the use of CSB between beneficiary and leader mother households, except that more leader mothers reported incorporating CSB into amaranth dishes. Since oil is a slightly more versatile ingredient than CSB, it was added to a wider range of recipes, but only by a small fraction of the group**.**

Table 3.9. Intake of CSB and Oil during the Previous 24 Hours[i]

	Leader mothers (n = 24)	Beneficiary mothers (n = 72)	All mothers (n = 96)
CSB			
Child 6–24 months of age[ii]	14 (82%)[iii]	44 (88%)[iv]	58 (87%)[v]
Beneficiary mother	19 (79%)	60 (83%)	79 (82%)
Oil			
Child 6–24 months[ii]	13 (76%)[iii]	32 (64%)[iv]	45 (67%)[v]
Beneficiary mother	21 (88%)	49 (68%)	70 (73%)

[i] Numbers are presented as n (%).
[ii] Only households with children between the ages of 6 and 24 months were included in this response.
[iii] n = 17.
[iv] n = 50.
[v] n = 67.

Amount of Time the Monthly Food Rations Last in the Household

Both CSB and oil rations usually lasted about 4 weeks among the beneficiary households sampled (**Table 3.10**). These results indicate that the rations they receive are likely sufficient to cover their needs for the month as intended by Tubaramure.

Table 3.10. Time the CSB and Oil Last in the Household[i]

	Leader mothers (n = 24)	Beneficiary mothers (n = 72)	All mothers (n = 96)
CSB			
Number of days CSB lasted from last distribution	24.7 (7.8)	26.0 (5.5)[ii]	25.7 (6.2)
Number of days CSB usually lasts	28.3 (3.7)	27.9 (5.8)[iii]	28.0 (5.3)[iv]
Oil			
Number of days oil lasted from last distribution	25.1 (6.7)[v]	26.0 (6.8)[vi]	25.8 (6.8)[iv]
Number of days oil usually lasts	27.2 (5.4)	27.5 (6.2)[vii]	27.4 (6.0)[viii]

[i] Numbers are presented as mean (SD).
[ii] n = 68.
[iii] n = 67.
[iv] n = 91.
[v] n = 22.
[vi] n = 69.
[vii] n = 65.
[viii] n = 89.

Non-Consumption Patterns of Food Rations: Sharing and Selling of Commodities

Almost half (45/95, 47%) of the beneficiaries reported sharing the CSB received from one of the last four distributions with individuals outside of their household; among these beneficiaries, the CSB ration was shared more often than not (2.8 out of 4 times). The typical amount of CSB shared was 0.9 kg. Beneficiary mothers shared their CSB more often than leader mothers, but they shared smaller quantities (0.81 kg vs. 1.78 kg). The main reason beneficiaries shared CSB was that the receiving person was a family member (13/95, 14%). Other reasons were to maintain good relations with their neighbors (9/95, 9%), to show courtesy (8/95, 8%), and to help other families with their children (8/95, 8%). One woman stated that she shares with her neighbors because "[i]t is our culture; if we receive something we have to

share with our neighbors." There was also a group of people that said that they shared their food in return for help transporting the rations home from the distribution site (7/95, 7%) and another group that shared out of fear (7/95, 7%). Sharing of the oil ration was less common (5/95, 5%). None of the beneficiaries reported selling their CSB or oil rations.

The majority of the beneficiary mothers (62/71, 87%) did not find that the food rations cause social problems for them or their families. Of the nine beneficiary mothers that did report social problems, five mentioned jealousy (5/9, 56%), four said they were insulted if they do not share their rations (4/9, 44%), and two reported that they were looked at badly (2/9, 22%). However, almost half of the leader mothers reported that receiving the food rations had caused social problems for them (10/24, 42%). Among the leader mothers that reported facing social issues, three mentioned that people often wanted a share of their rations (3/24, 13%), three said that they received insults if they did not share (3/24, 13%), two explained that other families around them felt excluded (2/24, 8%), and one mentioned that receiving rations had caused her to lose friends (1/24, 4%).

Beneficiaries' Perceptions of Dietary Changes

Overall, the majority of the mothers believed that the CSB and oil rations had improved their own diet (67/95, 71%), their beneficiary child's diet (68/95, 72%), and their household's diet (66/95, 69%). Leader mothers were more likely than beneficiary mothers to report these positive effects (data not shown).

When asked for the reasons why the food rations had a positive effect on the various household members' diets, responses were very similar between the leader and beneficiary mothers. The most commonly reported reason was that the food rations improved their own diets by providing them with a meal that they might not have otherwise had (26/67, 39%), breakfast being the most mentioned. As one beneficiary said: "It helps us a lot, especially with the morning's meal, breakfast." Other mentioned effects of the food rations were improved health (16/67, 24%), increased amounts of breast milk (13/67, 19%), and giving birth to a healthy child (2/67, 3%).

With regard to the perceived impacts of the food rations on their children's diets, the majority of beneficiaries stated that because of the food rations the beneficiary child was healthy (54/68, 79%). Some also mentioned that the rations provide a meal for the beneficiary child that he or she might not otherwise have received (10/68, 15%) and that the child receives enough breast milk from the mother as a result of her having access to the rations (10/68, 15%). One mother said that compared to her other children, the beneficiary child was born with good health.

Improved health (31/66, 47%) was the most mentioned effect of the rations on other household members. The rations also improved the nutrition of household members (10/66, 15%) and provided members of the household with a meal that they might not have otherwise had (26/66, 39%), breakfast again being the most frequently mentioned. One beneficiary said, "If we have taken CSB in the morning, we can make it to lunch in good form."

3.1.5. Summary of Results Regarding the Availability–Consumption Pathway

Overall, the components along the ***availability–consumption pathway*** related to the food distribution process were being delivered and utilized as planned and were assessed to be working well overall. This includes the program components related to the distribution of food rations to beneficiaries at food distribution sites and the beneficiaries' receipt of CSB and oil. The majority of food distribution sites were observed to be clean and to have roofs to cover at least the food commodities. Some beneficiaries and site managers did, however, mention that the coverings were not always sufficient to protect both the commodities and the beneficiaries.

Despite the potential barriers presented by the distances to the sites and the time spent waiting to collect rations, it was rare for a beneficiary to personally miss a distribution event, indicating the value they place on receiving these food commodities. At the observed sites, beneficiaries always received the correct amount of CSB and, on average, received more oil than they were supposed to. This was contrary to perceptions of some beneficiaries, who thought that they did not always receive enough CSB or oil. There were very few problems seen with the quality of the CSB or oil being distributed on the days sites were observed.

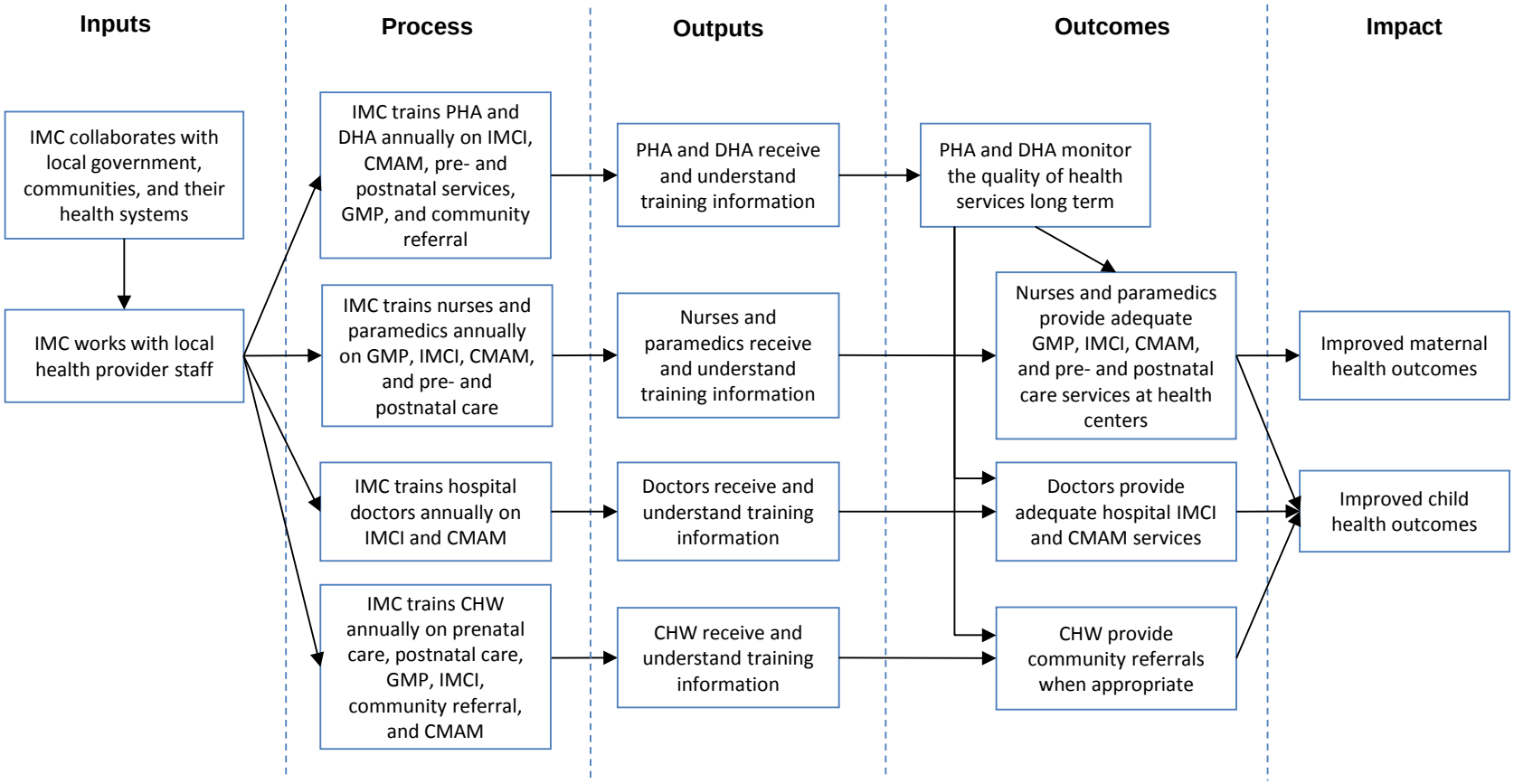
The majority of leader and beneficiary mothers and their beneficiary children had eaten both CSB and oil in the past 24 hours, indicating that the micronutrient-rich foods distributed by Tubaramure were reaching the targeted populations. Although a majority of beneficiaries had eaten CSB and oil in the past 24 hours and nearly three-quarters of the people interviewed thought that their diets had been improved through this intervention, the program component related to increased dietary intake and/or diversity of the beneficiary mothers and children could use some improvement. Promotion of the use of the CSB and oil by the beneficiary mothers and children (starting at the age of 6 months) should continue.

The results related to the implementation and utilization of the agricultural component must be viewed in light of the reported delayed implementation of that program component in the *collines* included in the process evaluation. The program components related to the provision of training for leader mothers and provision of seeds and chickens were classified as needing some improvement due to the fact that not all of the leader mothers had received training or vegetable seeds, and only two had received chickens. The program components related to the establishment of community gardens and provision of seeds for beneficiaries were classified as not working, although it was unclear if these program components were formally part of the program design, and, thus, may need to be reclassified. About half of the leader and beneficiary mothers had home gardens. This practice could use some improvement and should continue to be encouraged by Tubaramure to help beneficiaries produce their own micronutrient-rich food for home consumption. This may be especially important when the micronutrient-rich food commodities provided by Tubaramure are no longer available. Only about one-quarter of the leader mothers interviewed reportedly used the program inputs to either establish or improve their gardens and even fewer beneficiary mothers did the same. Among those that had received agriculture inputs, about half reported that they thought their diets had improved as a result of receiving these inputs.

3.2. The Knowledge–Use of Preventive Health Care Services Pathway

This section examines the second pathway through which Tubaramure is expected to improve the quality of preventive health services provided to the beneficiary population and to increase utilization of these services. To actualize the ***knowledge–use of preventive health care services pathway***, Tubaramure has provided training to provincial and district health authorities, doctors, nurses, and CHW (**Figure 3.3**). In addition, to ensure use of these preventive health services, Tubaramure strongly encourages all of the program beneficiaries to attend pre- and postnatal visits and to take their children under 24 months of age for GMP services. For this pathway, the evaluation focused on training provided for nurses and CHW, their knowledge related to the training, the provision of prenatal and GMP services to the beneficiary population, and the use of these services by the leader and beneficiary mothers.

Figure 3.3. Tubaramure Program Theory Framework Related to the Knowledge–Use of Preventive Health Services Pathway



Key:
IMC = International Medical Corps
PHA = provincial health authorities
DHA = district health authorities
IMCI = Integrated Management of Childhood Illness
CMAM = Community-Based Management of Acute Malnutrition
GMP = growth monitoring and promotion
CHW = community health workers

3.2.1. Description of Tubaramure's Program Components along the Knowledge–Use of Preventive Health Services Pathway

The national health system in Burundi is organized as a pyramid with three levels: central, intermediate, and peripheral. The Tubaramure program operates to improve the quality of health care at the peripheral level via district health centers and district hospitals. Government establishments provide free health care for pregnant women and children under 5 years of age. The Tubaramure program has fortified the provision of these free health care services within Cankuzo and Ruyigi by providing the district facilities with training and equipment. More specifically, the Tubaramure program has focused on improving the provision of prenatal care, postnatal care, GMP services for children under 24 months of age, Integrated Management of Childhood Illness (IMCI), and Community-Based Management of Acute Malnutrition (CMAM) in Cankuzo and Ruyigi. All Tubaramure institutional strengthening activities are carried out by IMC.

Provision of Training for Doctors, Nurses, Health Officers and Community Health Workers

IMC provincial technical assistants provide medical training for two nurses and two nurses' assistants working within each district health center and two doctors working within each district hospital. IMC largely focuses its efforts on training nurses and paramedics working in the health centers because they are the frontline staff for each community. They receive annual training on prenatal care, postnatal care, GMP, IMCI, and CMAM. IMC also trains the provincial and district health officers to monitor health care activities within the health centers and hospitals to ensure that services are implemented according to the components of the IMC training.

At the *colline* level, CHW are responsible for making home visits to provide health and nutrition education to the local population, identify antenatal and postnatal danger signs, and identify cases of child malnutrition for the purpose of making necessary referrals. On average, two CHW are responsible for each *colline*. As part of the Tubaramure program, IMC provides annual training for CHW on prenatal care, postnatal care, GMP, IMCI, and CMAM using a simplified Kirundi curriculum. CHW are supervised by provincial health technicians working at the district health center.

Utilization of Preventive Health Services by Beneficiary Mothers and Children

For optimal results, Tubaramure beneficiaries are strongly encouraged to routinely participate in preventive health care services. Although the use of such services is not a requirement for receiving food commodity rations, participation is promoted by all program staff during care groups and home visits provided by leader mothers and CHW. During pregnancy, beneficiaries are expected to register for prenatal services and complete four prenatal visits. During the first 6 months following delivery, beneficiaries are expected to register for postnatal services, complete two postnatal visits, and register the infant for GMP services. Children under 24 months of age are expected to attend monthly GMP services.

Prenatal Services Provided at District Health Centers

Prenatal services are also provided by nurses and their assistants. Women are advised to complete four prenatal visits. At these visits women should be weighed; given an obstetrical exam; and given advice related to their delivery plan, health and nutrition during pregnancy, and danger signs during pregnancy. During their first visit, women should receive a tetanus vaccine, if necessary, and a bed net. Anemic women should also be given iron-folate tablets during their first two trimesters of pregnancy (ideally visits one and two), and all women should receive them during their third trimester (ideally visits three and four). During their last trimester, women should also receive advice related to breastfeeding and family planning.

Growth Monitoring and Promotion Services Provided at District Health Centers

At district health centers, GMP services are administered by nurses and their assistants. Tubaramure beneficiaries are counseled to take their children under 24 months of age to the health center every month for GMP services to consult with a health worker for advice on child growth, nutrition, and feeding. At each GMP event, the children in attendance are weighed and their weight should be recorded on both the child's blue health card (which stays at the health center) and yellow health card (which the mother keeps). When the child's weight is obtained, it is plotted on the weight-for-age graph located on the child's blue health card; if, based on the child's weight, the child's nutritional status is categorized as malnourished, then the family should be advised to return for the next malnutrition assessment event. Children should then receive the necessary vaccinations according to their age and a twice yearly dose of vitamin A.

3.2.2. Results Related to the Knowledge–Use of Preventive Health Services Pathway

Background and Sex of Nurses and Community Health Workers

There were very few female nurses; however, nearly half of the CHW were female (**Table 3.11**). All but one of the nurses had completed secondary school. CHW on the other hand were unlikely to have reached secondary school. About half had completed primary school and some had never attended (Table 3.11). While the majority of nurses had nursing as their only career, most CHW had income-generating work that they did in addition to their voluntary work as a CHW (Table 3.11).

Table 3.11. Qualifications of Nurses and CHW Surveyed at Health Centers[i]

	Nurses (n = 22)	CHW (n = 22)
Female	4 (18%)	10 (45%)
Attended school	22 (100%)	18 (82%)
Highest level of school completed		
Primary incomplete	0 (0%)	4 (18%)
Primary complete	0 (0%)	10 (46%)
Some secondary	1 (5%)	3 (14%)
Secondary complete	21 (95%)	0 (0%)
Informal	0 (0%)	1 (5%)
Qualifications[ii]		
Level A1	0 (0%)	–
Level A2	4 (18%)	–
Level A3	18 (82%)	–
Have alternate occupations	2 (9%)	18 (82%)
Alternate occupations		
Mason	0 (0%)	1 (5%)
Carpenter	0 (0%)	1 (5%)

	Nurses (n = 22)	CHW (n = 22)
Literacy teacher	0 (0%)	1 (5%)
Community development agent	0 (0%)	1 (5%)
Student	0 (0%)	1 (5%)
Farmer	1 (5%)	10 (45%)
Store owner	1 (5%)	3 (14%)
Colline chief	0 (0%)	2 (9%)

[i] Numbers are presented as n (%).
[ii] A1 level nurses complete high school and 2 years of nurse training at the university level. A2 level nurses complete 4 years of nurse training after completing the 10th grade. A3 level nurses complete 2 years of nurse training after completing the 10th grade.

Nurses and Community Health Workers Receive Training on Health- and Nutrition-Related Topics and Understand the Information Presented

Nurses and Community Health Workers Receive Training on Health- and Nutrition-Related Topics

All of the nurses and CHW had received training in the past year in accordance with the intent of Tubaramure. They all reported that the training they had received was useful for them. The nurses explained that the training built on the knowledge they acquired during school (11/22, 50%), strengthened their capacity (9/22, 41%), and improved the quality of the services they deliver (7/22, 32%). CHW focused on the importance of receiving the lessons to help them educate those in their communities (9/22, 41%). As a result of being trained, the knowledge they provide has contributed to encouraging more women to attend pre- and postnatal care services and to deliver their babies at health centers rather than at home (8/22, 36%), as well as contributing to perceived reductions in malnutrition in their communities (8/22, 36%). As explained by one CHW, “The children are healthy; they no longer suffer from malnutrition.”

Barriers to Participation in Health- and Nutrition-Related Training

About one-third of both the nurses (8/22, 36%) and CHW (8/22, 36%) said that they sometimes faced barriers in being able to attend training sessions. Nurses primarily explained that when they have had trouble attending training it was because they lacked personnel to cover their jobs (8/22, 36%). As explained by one nurse, “We can’t abandon the sick patients if training is taking place; we have to stay at the health center.”

CHW, on the other hand, primarily mentioned having trouble with transportation (6/22, 27%) or being notified late (2/22, 9%). Some of them stated that they had been given bicycles to do their work, but that they were old and often broken.

Health- and Nutrition-Related Topics Reportedly Covered in Training Sessions of Nurses and Community Health Workers

In response to an open-ended question regarding what topics they had been trained on in the past year, fewer than one-half of the nurses and CHW reported receiving training related to postnatal care, GMP, CMAM, or IMCI, as intended by the program. About two-thirds of the CHW said that they received training in prenatal care, while only a few of the nurses said that they had received training on this topic in the past year. CHW had received training related to a variety of other topics, including HIV, malaria,

hygiene, malnutrition, and vaccinations. With the exception of malaria, a few of the nurses also mentioned receiving training on most of these same topics (**Table 3.12**). Although the vast majority of the CHW (21/22, 95%) and nurses (20/22, 91%) found many of the topics easy to understand, some of them found at least one of the topics difficult to understand. Topics that nurses reported being the most difficult to understand included those related to GMP, CMAM, IMCI, HIV, and malnutrition. CHW were less likely to mention that they had trouble understanding the topics that had been presented during their training, although a few mentioned having some difficulty with understanding postnatal care, HIV, and malaria.

Table 3.12. Topics Nurses and CHW Reported Having Received Training on in the Past Year, Those They Found Difficult to Understand, and Those for Which They Requested Additional Training[i]

	Nurses			CHW		
	Received training (n = 22)	**Difficult to understand (n = 22)**	**Requested more training (n = 22)**	**Received training (n = 22)**	**Difficult to understand (n = 22)**	**Requested more training (n = 22)**
GMP	9 (41%)	3 (14%)	6 (27%)	9 (41%)	0 (0%)	2 (9%)
CMAM	3 (14%)	1 (5%)	1 (5%)	9 (41%)	1 (5%)	4 (18%)
IMCI	9 (41%)	5 (23%)	14 (64%)	4 (18%)	1 (5%)	3 (14%)
Prenatal services	8 (36%)	1 (5%)	3 (14%)	14 (64%)	1 (5%)	4 (18%)
Postnatal services	6 (27%)	0 (0%)	2 (9%)	7 (32%)	4 (18%)	3 (14%)
Vaccinations	1 (5%)	0 (0%)	2 (9%)	7 (32%)	0 (0%)	4 (18%)
HIV	8 (36%)	8 (36%)	9 (41%)	16 (73%)	3 (14%)	9 (41%)
Nutrition	2 (9%)	1 (5%)	4 (18%)	9 (41%)	0 (0%)	4 (18%)
Malnutrition	3 (14%)	1 (5%)	2 (9%)	11 (50%)	1 (5%)	5 (23%)
Hygiene	2 (9%)	1 (5%)	0 (0%)	10 (46%)	0 (0%)	3 (14%)
Malaria	0 (0%)	0 (0%)	3 (14%)	12 (55%)	2 (9%)	7 (32%)
Family planning	3 (14%)	0 (0%)	5 (23%)	1 (5%)	1 (5%)	4 (18%)

[i] Numbers are presented as n (%).

Suggestions to Improve Nurse and Community Health Worker Skills and the Training Sessions They Receive

All of the nurses and CHW interviewed requested more training to review topics, to reinforce what they know, and to increase their knowledge. They requested additional training on all of the primary topics that should be included in their annual training sessions, such as GMP and pre- and postnatal care. The topics that are likely to be more technical and complex, such as IMCI and HIV, seemed to be the most challenging to understand and those for which the most requests for additional training were made (Table 3.12).

While all of the nurses and CHW found the training they received to be useful, the majority had suggestions for how it could be improved (16/22 nurses, 73%; and 17/22 CHW, 77%). Nurses primarily asked for additional training (7/22, 32%), to have more access to books or brochures explaining the topics (5/22, 23%), an increase in the per diem to attend the training (5/22, 23%), and that all nurses have an equal opportunity to attend training (4/22, 18%). CHW interviewed also asked for additional training sessions (5/22, 23%) and financial encouragement (4/22, 18%).

Health and Nutrition Knowledge among Nurses and Community Health Workers

On average, nurses and CHW knew that women should receive four prenatal visits and almost all knew that vaginal bleeding was a danger sign during pregnancy (**Table 3.13**). However, fewer than half of the nurses reported any of the other danger signs during pregnancy when asked to name all that they knew. While more than half of the CHW knew that severe stomach aches are a danger sign during pregnancy, fewer than a quarter of them reported that severe headaches or persistent vomiting are danger signs that require medical attention (Table 3.13).

Table 3.13. Prenatal Care Knowledge among Nurses and CHW[i]

	Nurses (n = 22)	CHW (n = 22)
Total number of prenatal care visits recommended	3.8 (0.4)	3.8 (1.0)
Danger signs during pregnancy; % that said:		
Vaginal bleeding	20 (91%)	20 (91%)
Severe headaches	9 (41%)	5 (23%)
Severe stomach aches	7 (32%)	13 (59%)
Persistent vomiting	10 (45%)	3 (14%)

[i] Numbers are presented as n (%) or mean (SD).

Aside from the presence of fever, the danger signs of childhood illness were not well known among nurses or CHW, although about 60 percent of nurses did know that a child not being able to drink or breastfeed is a danger sign that requires medical attention (**Table 3.14**). Unsurprisingly, all of the nurses and CHW interviewed knew that oral rehydration salts could be used in the treatment of diarrhea. Although the vast majority of nurses and the majority of CHW knew that children should be given more breast milk and liquids when they are sick, only about half reported that children should also receive more food when they are sick. Knowledge regarding best practices for feeding children during recovery was similar to CHW knowledge related to feeding children during illness, although a few more CHW stated that children should receive more food in addition to more breast milk and other liquids. Among the nurses interviewed, on the other hand, only about half of them thought that children should receive more breast milk, liquids, or food when they are recovering from an illness (Table 3.14).

Table 3.14. Knowledge of Child Health Care Practices among Nurses and CHW[i]

	Nurses (n = 22)	CHW (n = 22)
Danger signs of childhood illness; % that said:		
Cannot drink/breastfeed	13 (59%)	8 (36%)
Symptoms intensify	4 (18%)	0 (0%)
Fever	21 (95%)	19 (86%)
Rapid breathing	6 (27%)	4 (18%)
Trouble breathing	8 (36%)	7 (32%)
Bloody stools	4 (18%)	11 (50%)
Treating diarrhea; % that knew:		
The purpose of oral rehydration salts	22 (100%)	22 (100%)
Feeding a sick child; % that knew:		
To give more food	11 (50%)	10 (45%)
To give more liquids	20 (91%)	14 (64%)
To give more breast milk	18 (82%)	16 (73%)
Feeding a child immediately following recovery; % that knew:		
To give more food	10 (45%)	15 (68%)
To give more liquids	11 (50%)	13 (59%)
To give more breast milk	12 (55%)	18 (82%)

[i] Numbers are presented as n (%).

Nurses and CHW alike correctly stated that breastfeeding should begin immediately after birth and should continue exclusively for the first 6 months of life (**Table 3.15**). While the majority of nurses knew that children should begin receiving complementary foods at 6 months of age, fewer than half of the CHW knew that this was the optimal time for children to begin receiving complementary foods. Instead, they mainly believed that children should not be given food until after 6 months of age, with some saying children should not be given foods until as late as 9 months of age (6/22, 27%). In general, both nurses and CHW thought that children between the ages of 6 and 9 months should receive an average of four or three meals per day, respectively, and that children 1 year of age should receive about four meals per day (Table 3.15). This is more than the established minimum meal frequency for these two age groups, which is two and three, respectively (World Health Organization [WHO] 2008), and close to what the Tubaramure program promotes, which is three times per day for children between the ages of 6 and 9 months and four or five times per day for children 1 year of age or older.

Table 3.15. Breastfeeding and Infant and Young Child Feeding Knowledge of Nurses and CHW[i]

	Nurses (n = 22)	CHW (n = 22)
Breastfeeding		
Begin breastfeeding immediately after birth (< 1 h)	22 (100%)	21 (95%)
Age of introduction of liquids		
Before 6 months of age	0 (0%)	0 (0%)
At 6 months of age	21 (95%)	17 (77%)
After 6 months of age	1 (5%)	5 (23%)
Age of introduction of complementary foods		
Before 6 months of age	0 (0%)	0 (0%)
At 6 months of age	19 (86%)	9 (41%)
After 6 months of age	3 (14%)	13 (59%)
Appropriate meal frequency		
Children 6 to 9 months of age	4.2 (1.6)	3.4 (0.7)
Children 1 year of age	3.9 (1.1)	3.5 (0.8)

[i] Numbers are presented as n (%) or mean (SD).

In general, nurses and CHW were familiar with some optimal hygiene-related practices in that they all knew that soap should be used when washing hands and that hands should be washed before eating and after using the bathroom (**Table 3.16**). The majority of CHW interviewed also knew that people should wash their hands before feeding children, but only half of CHW and nurses knew that a person should wash his or her hands after cleaning a child who had defecated (Table 3.16).

Table 3.16. Hygiene Knowledge among Nurses and CHW[i]

	Nurses (n = 22)	CHW (n = 22)
Timing for handwashing		
Before eating	22 (100%)	22 (100%)
After using the bathroom	22 (100%)	21 (95%)
Before feeding a child	11 (50%)	17 (77%)
After cleaning a child who defecated	11 (50%)	10 (45%)
Handwashing products		
Soap	22 (100%)	22 (100%)
Ash	3 (14%)	5 (23%)

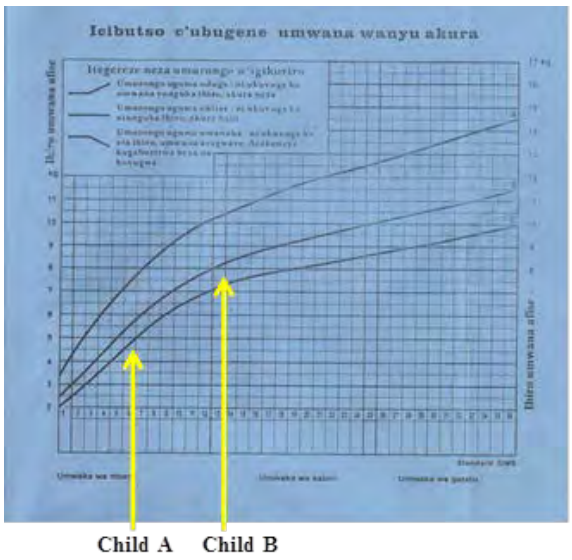
[i] Numbers are presented as n (%).

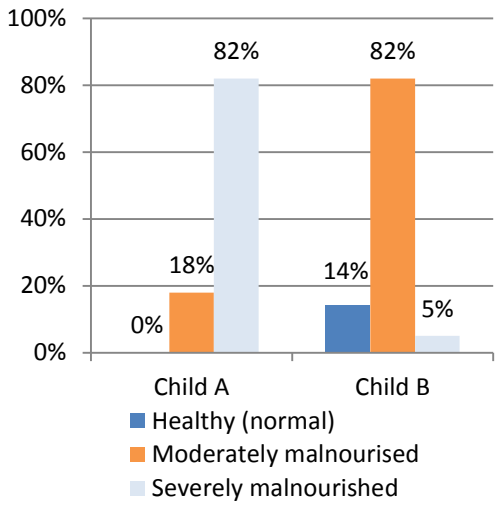
Practical Demonstration of Knowledge in Assessing Children's Nutritional Status among Nurses and Community Health Workers

Nurses are responsible for weighing children and for charting their weight-for-age on the children's blue and yellow health cards at their GMP visits. CHW are responsible for identifying children in their communities that are at risk of being malnourished and for assessing their nutritional status using a mid-upper arm circumference (MUAC) tape. At the end of their respective interviews, nurses and CHW were given details about two children that were necessary to chart either their weight-for-age or MUAC and were asked to report whether the children were healthy, moderately malnourished, or severely malnourished.

In general, nurses were competent with both calculating children's ages given their date of birth and the date of the interview and were able to correctly classify the children as moderately or severely malnourished according to weight-for-age criteria (**Figure 3.4**). Although all but two of the CHW interviewed stated that they were familiar with how to use the MUAC tape, most were unable to correctly classify children as either severely malnourished or healthy using MUAC (**Figure 3.5**).

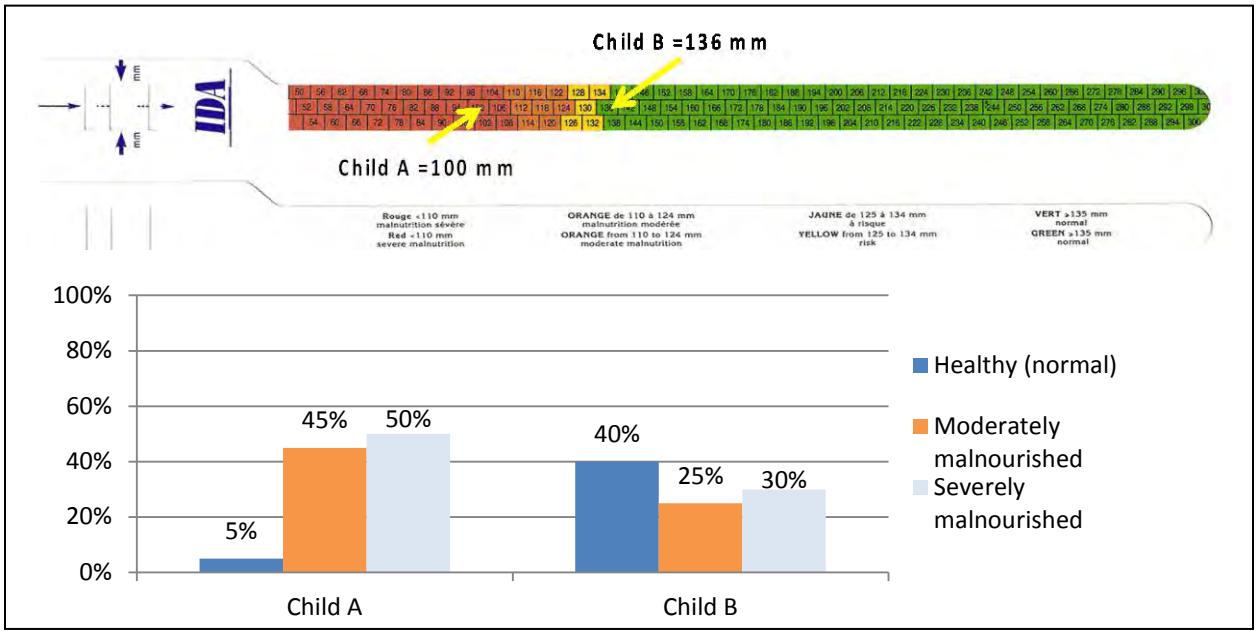
Figure 3.4. Nurse's Classification of Children as Healthy, Moderately Malnourished, or Severely Malnourished Using the Blue Health Card[i]





[i] Child A should have been classified as severely malnourished and child B as moderately malnourished.

Figure 3.5. CHW's Classification of Children as Healthy, Moderately Malnourished, or Severely Malnourished using a MUAC Tape[i]



[i] Child A should have been classified as severely malnourished and child B should have been classified as healthy.

Home Visits Provided by Community Health Workers for Women and Children under 24 Months of Age

All of the CHW interviewed stated that they make home visits to the people living in their communities. All of them also said that during these home visits they give advice to women about women and children's' nutrition and health. They reported encouraging women to attend their pre- and postnatal care visits and to take their children under 24 months of age to receive GMP services, vaccinations, and medical care when they are sick (**Table 3.17**). In addition, many of them stated that they also provide advice on a wide range of health- and nutrition-related topics, including hygiene, with regard to personal care and food preparation, the importance of immediate and exclusive breastfeeding for the first 6 months of life, and the importance of providing diverse and balanced foods for women and children. A few of the CHW also mentioned that they advised mothers of young children to increase the frequency of feeding as children get older (Table 3.17).

Table 3.17. Services Provided by CHW[i]

	CHW (n = 22)
Provided home visits	22 (100%)
Health and nutrition advice for children < 24 months of age	
Provided health and nutrition advice for children < 24 months of age	22 (100%)
Reported health and nutrition advice given for children < 24 months of age[ii]:	
Hygiene for children	10 (45%)
Taking children to receive GMP, vaccinations, or medical care when they are sick	13(59%)
Immediate and exclusive breastfeeding for children between 0 and 6 months of age	13 (59%)
Feeding children balanced food, including CSB	17 (77%)
Making enriched porridge with CSB, fruits, vegetables, and other foods	8 (36%)
Increasing the frequency of feeding for children as they get older	4 (18%)
Health and nutrition advice for women	
Provided health and nutrition advice for women	22 (100%)
Reported health and nutrition advice given for women[ii]:	
How to prepare balanced/diverse food	19 (86%)
Hygiene-related advice	19 (86%)
Importance of pre- and postnatal care	12 (55%)
Family planning, especially for those that have had previous complications	9 (41%)
Importance of HIV screening	4 (18%)
Use of bed nets to prevent malaria	3 (14%)

[i] Numbers presented are n (%).
[ii] Responses come from open-ended questions.

In general, the CHW had the impression that the women they visited believed what they told them and that they generally followed their advice. However, there were some women that they did not think followed their advice. They believed that the primary reasons women may not have followed their advice were due to ignorance (11/22, 50%), poverty (8/22, 36%), and in some cases negligence (6/22, 27%). As explained by one CHW, “They are preoccupied with their own activities and forget about their children.”

Home Visits Received by Beneficiaries from Community Health Workers

Although all of the CHW reported making home visits, fewer than half of the leader and beneficiary mothers reported having received a visit from a CHW since joining Tubaramure (**Table 3.18**). Those that had received visits primarily reported that they had received between one and three visits over the past 4 months. Leader mothers were most likely to report having received either one (4/10, 40%) or three visits (4/10, 40%) over the past 4 months, and beneficiary mothers received either one (6/20, 30%) or two visits (10/20, 50%) over the same period. Leader and beneficiary mothers primarily reported that the CHW gave them advice related to either health or hygiene during their visits, with some receiving

instructions or follow-up regarding the construction and maintenance of some of the hygiene-related items promoted by Tubaramure (Table 3.18). In addition, two women specifically mentioned that the CHW came to visit them to ensure that the lessons that they had been taught were being implemented. As explained by one beneficiary mother, "They give those who have forgotten to practice reminders so that they can do the practices that are taught." The vast majority of the leader and beneficiary mothers believed that the visits that they had received from the CHW were useful for themselves, as well as for their children. One mother explained that the visits were helpful because they taught her "how to ensure the good health of [her] child." Some of the leader mothers explained that the CHW can help them get assistance when someone is sick. As stated by one leader mother, "If your child is sick and you do not want to take him to the hospital, the [CHW] can persuade you to do so." And another explained, "When you are sick and do not have any money, the CHW gives us a paper that can help us receive medication."

Table 3.18. Home Visits Provided by CHW to Leader and Beneficiary Mothers Interviewed at Home[i]

	Leader mothers (n = 24)[ii]	Beneficiary mothers (n = 72)[ii]
Home visits		
Received a CHW home visit since joining the Tubaramure program	10 (42%)	20 (28%)
Advice received from CHW during last visit[iii]		
Health-related advice	5 (50%)[iv]	8 (40%)[v]
Hygiene-related advice	2 (20%)[iv]	8 (40%)[v]
Family planning	1 (10%)[iv]	2 (10%)[v]
Prevention of HIV	1 (10%)[iv]	2 (20%)[v]
Prevention of malaria	2 (20%)[iv]	1 (5%)[v]
Construction and maintenance of a dish rack, tippy tap, or latrine	3 (30%)[iv]	5 (25%)[v]
Told the mother to attend BMCG	0 (0%)	2 (10%)[v]
Told the mother to take children for GMP visits	0 (0%)	2 (10%)[v]
Nutrition-related advice	0 (0%)	1 (5%)[v]
Attitudes and beliefs		
Believe CHW are helpful with regard to their (maternal) health	9 (90%)[iv]	19 (95%)[v]
Believe CHW are helpful with regard to their child's health	9 (90%)[iv]	17 (85%)[v]

[i] Numbers are presented as n (%).
[ii] Maximum sample sizes are presented.
[iii] Responses are from open-ended questions.
[iv] n = 10.
[v] n = 20.

Beneficiaries Taking Their Children for Growth Monitoring and Promotion Visits

All of the leader mothers interviewed at home that had a child under 24 months of age had taken their child to at least one GMP visit; the majority of beneficiary mothers had done the same (**Table 3.19**). Those that had taken their children said they did it primarily to see the child's growth and to have the

child's health checked. Two leader mothers and two beneficiary mothers mentioned that they did this because they learned of its importance from the Tubaramure program. Among those that have not taken their children to a GMP visit (12/70, 17%), the reasons for not going were that they were not aware that they should go (3/12, 25%), their children were too young (3/12, 25%), they had plans to visit a health center soon (2/12, 17%), the health center was too far (1/12, 8%), the nurse was not there when they went (1/12, 8%), or simply that it was not something people in the community did (1/12, 8%).

Table 3.19. Attendance to GMP Visits[i]

(0%)	Leader mothers (n = 23)[ii]	Beneficiary mothers (n = 70)[ii]
Growth monitoring and promotion visits		
Attended at least one visit since birth	23 (100%)	58 (83%)
Number of growth monitoring visits attended in past 4 months		
Attended at least one visit in the past 4 months	22 (96%)	44 (63%)
Attended four visits in the past 4 months	7 (30%)	8 (11%)
Curative care		
% that take their child to a health center when the child has diarrhea		
Never	0 (0%)	1 (1%)[v]
Sometimes	0 (0%)	3 (4%)[v]
Always	21 (100%)[iii]	63 (90%)[v]
% that take their child to a health center when the child has a fever		
Never	0 (0%)	1 (1%)
Sometimes	0 (0%)	2 (3%)
Always	22 (100%)[iv]	66 (96%)

[i] Numbers are presented as n (%).
[ii] Maximum sample size presented.
[iii] n = 21.
[iv] n = 22.
[v] n = 67.

Leader mothers were more likely than beneficiary mothers to have taken their children for a GMP visit in the past 4 months and to have attended the recommended one visit per month over the past 4 months, although those taking their children for four visits in the past 4 months was low among leader mothers and extremely low among beneficiary mothers (Table 3.19). Use of curative health services for the treatment of diarrhea and fever were reportedly nearly universal among the leader and beneficiary mothers interviewed (Table 3.19).

Quality of Growth Monitoring Services Provided at the District Health Center

Growth Monitoring Services and Recordkeeping Provided by Nurses

Nearly all of the mothers of the children observed had their yellow health card with them and had a blue health card available at the health center (**Table 3.20**). During the observed GMP visits, all of the children were weighed and all of their mothers were told how much their children weighed. In most cases, their

weight was recorded on the blue health card. However, it was less likely to also be recorded on the yellow health card. A little more than three-quarters of the children that had their weight recorded on the blue health card also had their weight-for-age charted on this card and fewer than half had it charted on the yellow health card (Table 3.20). Among the children whose weight-for-age was charted, three children were identified as being severely malnourished. According to the protocol, mothers should be told to have their child attend treatment and should be given some advice related to care for their child. None of the mothers of these three children were observed to have received any advice from the nurses, nor was there any indication that they had been told to return for treatment. In general, very few women received any advice from the nurse during the observed GMP consultations (Table 3.20). All of these women were told that their children were growing well, one was told to continue breastfeeding, and one was told to feed her child three times per day. Recording of vaccines on the yellow health cards was more likely to occur than it was of weight. Nearly all of the children that received vaccines had them recorded on both the blue and yellow health cards (Table 3.20). In fact, only one child who had the yellow health card and received a vaccine was not observed to have had it recorded by the nurse responsible for doing so. In the other cases where the vaccinations were not recorded on the blue or yellow health card, it was because the child did not have the card on the day of the visit. With the exception of vaccinations, records were more likely to be made on the blue health cards that stay at the health center than on the yellow health cards that the mothers keep with them.

Table 3.20. Provision of GMP Services by Nurses[i]

	Beneficiary children 0–24 months of age (n = 55)[ii]	Recorded on blue health card (n = 50)[ii]	Recorded on yellow health card (n = 47)[ii]
Had blue health card	50 (91%)	–	–
Had yellow health card	47 (85%)	–	–
Weight measured	55 (100%)	49 (98%)	35 (74%)
Weight-for-age charted on blue health card	–	39 (80%)[iii]	14 (41%)[vii]
Height measured	9 (16%)	–	4 (57%)[viii]
Charted as being severely malnourished	3 (5%)	–	–
If classified as severely malnourished, received advice	0 (0%)	–	–
Received any health or nutrition advice	3 (5%)	–	–
Received vaccines	41 (75%)	38 (93%)[iv]	37 (90%)[iv]
Received vitamin A	18 (33%)	17 (94%)[v]	12 (67%)[v]
Received deworming medication	5 (9%)	3 (60%)[vi]	2 (40%)[vi]

[i] Numbers are presented as n (%).
[ii] Maximum sample size presented.
[iii] n = 49.
[iv] n = 41.
[v] n = 18.
[vi] n = 5.
[vii] n = 34.
[viii] n = 7.

Beneficiaries' Perceptions and Opinions Related to Services Received at the Observed Growth Monitoring and Promotion Visits

Overall, beneficiary mothers observed and interviewed at the GMP visits were satisfied with their experience (54/55, 98%). Only one mother said that she was not satisfied and explained that she thought her child should have received vaccinations that the child did not receive. A few mothers also mentioned that they would have liked to have received more care for their sick children (4/55, 7%) and one mentioned that she "wanted to receive some advice regarding how to properly feed her child."

Barriers to Taking Children to Growth Monitoring and Promotion Visits

None of the beneficiary mothers reported having any problems getting to the health centers and only two thought that they had spent too much time there. The others thought either that it was a reasonable amount of time (45/55, 82%) or that it was fast (7/55, 13%). All but 1 of the 55 observed beneficiary mothers felt respected by the health staff, and only one reported having any problems during her child's GMP visit. The one that did not feel respected stated that she had an argument with one of the nurses regarding the notebook she wanted to use to record her child's vaccinations. The beneficiary who said she had a problem with a staff member said that she had been humiliated by the staff member in question.

Although nearly one-third of the beneficiary mothers observed and interviewed at the GMP visit said that bringing their children to the health center on that day had interfered with some of their other activities (16/55, 29%), such as farming and household responsibilities, all reported that they plan to bring their children for their next GMP visit.

Nurses' Perceptions and Opinions Related to Their Ability to Provide Optimal Growth Monitoring and Promotion Services

Although those that attended their children's GMP visits were generally satisfied and had good experiences with the nurses at the health centers, the majority of nurses reported barriers to providing optimal GMP services (17/22, 77%). In terms of their ability to provide high-quality GMP services, nurses repeatedly mentioned shortage of staff as a key problem. This is a challenge because nurses then have to work extra hours to attend to all of the patients and it prevents them from being able to attend training or to take leave because there are no staff to cover their duties if they were absent. Shortages in supplies necessary to conduct GMP consultations were also mentioned as barriers to providing optimal care.

Beneficiaries Attendance at Pre- and Postnatal Care Visits

Leader and beneficiary mothers alike reportedly attended their four required prenatal visits during their pregnancy (**Table 3.21**). The majority also said that they had delivered their babies at either a hospital or a health center, as opposed to delivering at home. Both leader and beneficiary mothers were less likely to seek postnatal care as compared to prenatal care and only about one-quarter of the beneficiary mothers interviewed at home said that they had attended a postnatal visit within 6 weeks of giving birth.

Table 3.21. Prenatal and Postnatal Care Practices among Beneficiary Mothers Sampled[i]

	Leader mothers (n = 23)[ii]	Beneficiary mothers (n = 70)[ii]
Prenatal care visits with a health professional		
Total number of visits	4.2 (1.5)	4.1 (1.4)[iii]
Had four visits	17 (74%)	50 (72%)[iii]
Location of delivery		
Health center	13 (57%)	40 (58%)[iii]
Hospital	6 (26%)	16 (23%)[iii]
At home	2 (9%)	9 (13%)[iii]
In transit	2 (9%)	4 (6%)[iii]
Postnatal care		
Received postnatal care from a health professional within 6 weeks of giving birth	11 (48%)	19 (27%)

[i] Numbers are presented as n (%) or mean (SD).
[ii] Maximum sample sizes presented.
[iii] n = 69.

Quality of Prenatal Care Provided at Health Centers

Prenatal Care Provided by Nurses

Overall, the nurses generally followed the standard steps in providing prenatal care (**Table 3.22**). They measured the height of the women at their first prenatal visit and in some cases during their second or third visits, especially if this had been missed at the first visit. They almost always weighed the women as per standard procedure and in all cases when height or weight was measured it was recorded. In the majority of cases, women's blood pressure and heartbeat were checked, although this was not as common during the fourth visit. All women were given a pelvic exam as expected at their first three visits, as were the majority of women attending their fourth prenatal visit. During nearly all of the observed prenatal visits the baby's heartbeat was checked (Table 3.22).

Half of the nurses interviewed stated that they faced barriers in providing optimal prenatal services (11/22, 50%). Barriers mentioned included lack of iron or prenatal consultations forms (2/11, 18%); too small an area for giving consultations (2/11, 18%); women coming too late in their pregnancy for prenatal services (4/11, 36%); women that prefer to be assessed by women, while the majority of nurses are male (1/11, 9%); and some women that decline sensitive parts of the exam (1/11, 9%). The other half of nurses that did not mention barriers thought that they had adequate materials and equipment to provide the necessary services (6/11, 55%) and that regular prenatal services are available (4/11, 36%); a few said that they did not see any problems with the prenatal services since the women served by their health centers utilize these services (3/11, 27%).

Table 3.22. Provision of Prenatal Care by Nurses[i]

	Pregnant beneficiary women			
	First visit (n = 14)	**Second visit (n = 17)**	**Third visit (n = 13)**	**Fourth visit (n = 10)**
Height measured	9 (64%)	2 (12%)	3 (23%)	0 (0%)
Height recorded	9 (100%)	2 (100%)	3 (100%)	0 (0%)
Weight measured	14 (100%)	16 (94%)	13 (100%)	9 (90%)
Weight recorded	14 (100%)	16 (100%)	13 (100%)	9 (100%)
Blood pressure taken	11 (79%)	14 (82%)	11 (85%)	3 (30%)
Woman's heartbeat checked	12 (86%)	13 (76%)	12 (92%)	5 (50%)
Pelvic exam conducted	14 (100%)	17 (100%)	13 (100%)	7 (70%)
Baby's heartbeat measured	12 (86%)	15 (88%)	13 (100%)	10 (100%)
Woman asked if she was having any health problems	8 (57%)	4 (24%)	8 (62%)	3 (30%)
Woman given advice related to her health	1 (7%)	1 (6%)	2 (15%)	0 (0%)

[i] Numbers are presented as n (%).

One thing that seemed to be lacking were discussions with women regarding health and nutrition problems and/or advice. In fact, very few observations were made of pregnant women receiving any health or nutrition advice during their prenatal consultations (Table 3.22). The advice that was given included to eat more food, including vegetables, proteins, fats, carbohydrates, and CSB (4/55, 7%); that vaginal bleeding was a danger sign during pregnancy (3/55, 5%); and to use a mosquito net (1/55, 2%). During the observed summary of the visit given by the nurses to the beneficiaries, six women were told that they had different types of problems with their health and/or pregnancy; of these women, only two had received any health or nutrition advice during their visit. One of these women had been told to eat more vegetables because she was losing weight and the other was told to seek treatment because she was sick.

Beneficiaries' Perceptions and Opinions Related to Services Received at the Observed Prenatal Visits

For the most part, the women that were interviewed following their prenatal visits received the services that they were expecting to receive (51/55, 93%). Among those that did not, two wanted to be treated for their illnesses; two thought that they would be given iron; and one thought that she should have received a paper so that she could deliver at the hospital, but was told she that would get it later. Only 7 of the 55 women interviewed said that they would have liked to have received additional services, such as medicine for stomach pain (1/55, 2%), vitamins (1/55, 2%), or a mosquito net (1/55, 2%); to have her blood pressure measured (1/55, 2%); to be screened for HIV (1/55, 2%); or to be treated for illness (2/55, 4%).

Overall, women were satisfied with the prenatal visits they received (52/55, 95%). Among those that were not satisfied, one said that the nurse had not done everything that she was supposed to, one said that she was not weighed, and one person complained that "[the nurse] did everything too quickly without asking me any questions." Those that thought that the services they received could have been improved (16/55, 29%) discussed wanting the health centers to have all the necessary equipment (4/16, 25%), provide iron (4/16, 25%), have more nurses (2/16, 13%), give training to the nurses (1/16, 6%), provide health and

nutrition advice (2/16, 13%), and treat pregnant women that are sick (1/16, 6%). The majority of women said that they would return for their next prenatal visit (48/55, 87%) and those that were not planning to return all stated that it was because they were at their fourth visit. One woman who had just completed her fourth prenatal visit correctly explained that "normally a person only comes for four visits unless there are problems with the pregnancy."

Barriers to Attendance at Preventive Health Visits

When asked whether or not they were able to access health care services when needed, the majority of leader mothers and beneficiary mothers said that they could (22/24, 92%, and 69/72, 96%, respectively). Those that could not said that it was too far, that they were sometimes not well received, that it depended on the availability of nurses or equipment, or that it depended on whether or not they had money when they needed to use the services. Likewise, it was rare for either leader mothers or beneficiary mothers to report that they had been turned away when trying to receive medical care (2/22, 9%, and 7/72, 10%, respectively). Of those that were turned away, three said that it was because they had run out of vaccines, one was told that she arrived too late, another arrived on a day that they were not open, one said that it was due to a political problem, and one said that it was because she did not have money.

Some of the CHW interviewed (7/22, 32%) and about half of the nurses (10/22, 45%) thought that at least some mothers face barriers to attending preventive health visits for themselves or for their children. The primary reasons, which were mentioned by two CHW each, were religious beliefs against receiving medical care, preoccupation with other activities and no time for taking care of their health, and poverty and ignorance. CHW believed that providing more training to the women in their communities (10/22, 45%); constructing health centers close to villages, where they do not already exist (5/22, 23%); and ensuring that health care for women and children is free (3/22, 14%) would improve the ability of the women in their communities to attend the necessary preventive health visits. Nurses echoed CHW's responses regarding the problem of ignorance (4/22, 18%) and transportation issues (2/22, 9%), and also mentioned the use of traditional medical treatments as a barrier (2/22, 9%). They also agreed with the CHW that raising awareness in the communities was the best way to improve the situation (9/22, 41%) and that the provision of free health care would also likely encourage women to utilize services for themselves and their children (3/22, 14%).

Motivations of Health Care Providers

Community Health Workers

Although the majority of CHW enjoy their work (21/22, 95%) and all of them plan to continue in their role as a CHW, nearly half of them stated that it takes too much time and that they do not have time to attend to their other responsibilities (10/22, 45%), including their income-generating activities (9/22, 41%), household responsibilities (5/22, 23%), or other community responsibilities (2/22, 9%). Furthermore, the majority of CHW have faced challenges in doing their work. These challenges include a lack of teaching materials (5/22, 23%), difficulty in dealing with the weather and what they describe as a lack of adequate rain gear (5/22, 23%), and lack of a salary and of transport means or allowances (4/22, 18%). CHW believed that the provision of additional training (6/22, 27%) and a salary (17/22, 77%), from 10,000 to 100,000 Burundi Franc per month, would help them better fulfill their roles. A couple of CHW also mentioned the provision of uniforms or identification cards (4/22, 18%), transportation (2/22, 9%), or visits and follow-ups in their communities (2/22, 9%) as things that would help them do their jobs better.

Nurses

About half of the nurses said that they faced problems with their work (10/22, 45%), primarily citing a lack of staff (7/22, 32%) and a lack of materials for providing optimal care (4/22, 18%). Those that discussed a lack of staff emphasized that they are sometimes unable to provide services and that they feel overworked. As stated by one nurse, "There are services that are not available every day because of the lack of staff." Another explained, "[I am] overloaded. According to the WHO, a nurse should deal with 1,500 people per year, but I deal with 5,425 per year." Despite these problems, all but one of the nurses interviewed planned to continue in their jobs. They all felt capable of doing their jobs and appreciated for the work that they do. However, more than half thought that they did not receive sufficient compensation for the work that they do (13/22, 59%). They asked for increased salaries (13/22, 59%), performance-based bonuses (10/22, 45%), more training (1/22, 5%), or free health care for themselves (1/22, 5%). Aside from the compensation issue, many of the nurses asked that more qualified staff be hired (10/22, 45%) and that they have more access to training (6/22, 27%) and sufficient supplies (4/22, 18%).

3.2.3. Summary of Results Related to the Program Components along the Knowledge–Use of Preventive Health Care Services Pathway

While all of the nurses and CHW interviewed reported that they had received at least one health- and nutrition-related training as per Tubaramure's intent, fewer than half of them said that they had received training on the vast majority of the key topics that should be covered in their training sessions. As these responses came from open-ended questions in which nurses and CHW were asked to describe all of the topics that they had received training on, it is possible that they had in fact received the training and just did not remember at the time the question was asked. The results do, however, give some indication as to which topics were most likely to be remembered and understood, and those that posed some difficulty in terms of understanding and for which nurses and CHW asked to receive more training.

Results from the knowledge tests given to the nurses and CHW indicated that they could benefit from receiving further training related to danger signs during pregnancy and childhood illness and related to optimal child feeding practices, both in general and specifically when children are sick or recovering from illness. The nurses' seeming lack of knowledge related to washing hands before feeding a child and both nurses' and CHW's seeming lack of knowledge related to washing hands after cleaning a child who defecated should also be addressed, as these are common routes through which children get exposed to infectious agents. In addition, nurses and CHW requested receiving additional training related to the prevention, screening, and treatment of HIV, and with regard to IMCI. These topics were the ones that nurses were the most likely to report being difficult for them to understand. CHW should also be provided with further training in the use of the MUAC tapes, as they did not seem to know how to read their measurements correctly even though they are expected to screen children for severe acute malnutrition using this method. Practical demonstrations and verification of their ability to correctly use this method for classifying children's nutritional status should be included in the training provided to them and any other program implementers that are expected to use this method to screen for severe acute malnutrition, such as leader mothers. As nurses and CHW are the health workers that beneficiaries are most likely to come in contact with, it is essential that they are well trained in all of the health and nutrition practices promoted by Tubaramure, both to increase their general knowledge related to these topics and to reinforce the messages received by the beneficiary population through other channels.

Although all of the CHW interviewed reported making home visits, fewer than half of the leader mothers and fewer than one-quarter of the beneficiary mothers interviewed at home said that they had received a visit from a CHW since joining Tubaramure. Those that had received visits had positive things to say; they generally thought that the visits were useful and provided them with good information related to

hygiene, health, and nutrition. A few also mentioned that the CHW were helpful when beneficiaries needed to seek curative care. To make CHW visits as useful as possible, their technical training should be improved. Once their technical training is reinforced, means of transportation and other small items, such as reference materials, uniforms, and identification cards that aid them in doing their work, should be provided because these health workers seem to like doing their job and their visits were found to be helpful. Increasing coverage of home visits by better trained CHW among the beneficiary population would also likely help Tubaramure reach its goals related to improving health- and nutrition-related knowledge and practices among the beneficiary population.

Although the majority of both leader and beneficiary mothers reported that they had attended the recommended four prenatal visits during their last pregnancy, they were far less likely to report having taken their children under 24 months of age to the recommended four GMP visits over the past 4 months. The majority of mothers had taken their children at least once since birth; however, fewer than two-thirds of the beneficiary mothers had taken their children for a GMP visit in the past 4 months. The importance of attending GMP visits should continue to be encouraged by Tubaramure.

The provision of preventive health services could be improved both for prenatal services and for GMP services. The primary aspect that could use improvement in both cases is the provision of health- and nutrition-related advice. During the observations of both types of visits, very little advice was observed to be given, even in cases where pregnant women were told that they were having a problem or when children were charted as being severely malnourished. The seeming lack of provision of health- and nutrition-related advice was likely at least partially due to the time constraints that the nurses reported facing. Nevertheless, this is something that should be addressed. Although it is outside the scope of Tubaramure, the potential that the promotion of attendance at preventive health services may place increased demand on an already stretched health system should be considered. Ways to address this potential challenge is something that should be considered in the design phase of similar programs. With regard to the provision of GMP services, nurses should be encouraged to record weights and services received on both the blue and yellow health cards because mothers found it useful to have this information.

3.3. The Knowledge–Adoption of Essential Nutrition and Hygiene Practices Pathway

This section evaluates the program components that lie along Tubaramure's third program impact pathway, the ***knowledge–adoption of essential nutrition and hygiene practices pathway***. To actualize this pathway, Tubaramure began by creating a BCC strategy and associated program materials. Health promoters hired by the program to implement the BCC strategy were trained in adult education techniques as well as the technical material contained in the BCC strategy. Health promoters were then expected to provide training to leader mothers on individual topics twice a month. After receiving the lesson during their LMCG, leader mothers teach their BMCG the same lesson they learned (**Figure 3.6**). It is expected that the provision of the training to the different groups will improve their health- and nutrition-related knowledge and practices and contribute to improvements in maternal and child health and nutrition outcomes. Along this pathway, the implementation and utilization of the LMCG and BMCG were evaluated. In addition, health- and nutrition-related knowledge covered in the LMCG and BMCG lessons were assessed among THP, leader mothers, and beneficiary mothers, and health- and nutrition-related practices were assessed among leader mothers and beneficiary mothers.

3.3.1. Description of Tubaramure's Primary Program Components along the Knowledge–Adoption of Essential Nutrition and Hygiene Practices Pathway

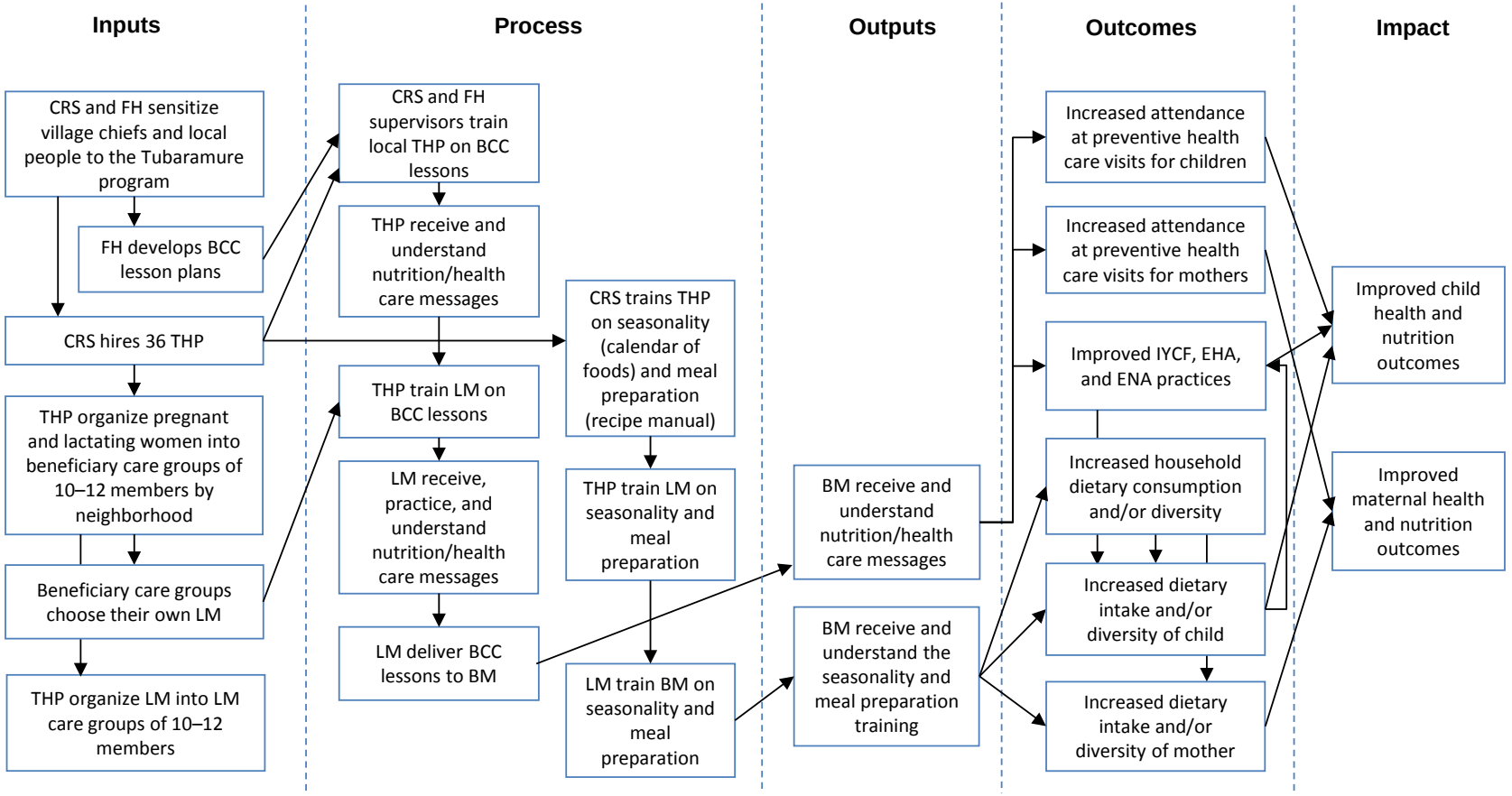
Leader and Beneficiary Mother Care Groups

The BCC strategy for Tubaramure was designed as a cascade training system in which the THP hired by the program receive training from CRS and FH in BCC, seasonality, and meal preparation ; the THP then teach the same lessons to groups of leader mothers, who in turn teach the lessons to groups of beneficiary mothers. Given the low levels of education among the leader and beneficiary mothers, it was decided that they should learn one lesson per care group meeting to ensure that the lessons would be understood and that those responsible for teaching the messages to the next group would be able to do so.

LMCG were formed based on village location and were supposed to consist of between 10 and 12 leader mothers that were elected by their peers to lead their BMCG. The LMCG should be held every 2 weeks. At these meetings, the THP teaches them the lesson for that 2-week period. The leader mothers then teach the same lesson to their BMCG, which meet every 2 weeks. Each BMCG should, therefore, learn two lessons per month, but it is possible for the group to request two sessions to adequately learn one lesson. Leader mothers were further expected to follow up with beneficiary mothers in between formal BMCG meetings.

Evaluation of a program in Haiti found that it was more effective to form groups based on women's physiological status (pregnant/lactating) or on the age of the beneficiary child so that they could receive lessons that corresponded to their particular needs (Ruel et al. 2008). However, given the geography of Cankuzo and Ruyigi, it was thought that a significant barrier to attendance would have been created if women had to walk great distances to attend care group sessions. It was therefore decided to limit the size of BMCG to a maximum of 10–12 women that lived within close proximity of each other. To meet beneficiaries' individual needs, a card with key messages was created and this was supposed to be used in the one-on-one consultations with beneficiary mothers.

Figure 3.6. Tubaramure Program Theory Framework Related to the Knowledge–Adoption of Essential Nutrition and Hygiene Practices Pathway



Key:
CRS = Catholic Relief Services
FH = Food for the Hungry
THP = Tubaramure health promoters
LM = leader mothers
BCC = behavior change communication
BM = beneficiary mothers
IYCF = infant and young child feeding
EHA = Essential Hygiene Actions
ENA - Essential Nutrition Actions

Behavior Change Communication Strategy and Materials

The curriculum contains five BCC modules, each with between 6 and 12 lessons. Each lesson was developed by FH with detailed illustrations to explain the core messages. The first module, "Care Group Orientation," contains six lessons on the program's objectives, teaching techniques, leader mother responsibilities, watching for change and monitoring groups, the value of children, and the ability to change. The second module, "Essential Nutrition, Hygiene, and Care Practices during Pregnancy," has nine lessons on antenatal care services and developing a birthing plan, maternal nutrition, micronutrients (iron and iodine), handwashing with soap (or ash), the creation of household handwashing stations, malaria prevention, preparing for delivery and birth, immediate breastfeeding and the use of colostrum, and newborn care practices. The third module, "Essential Nutrition, Hygiene, and Care Practices during Infancy," contains 12 lessons on the importance of postpartum care, various aspects of exclusive breastfeeding, childhood illness danger signs, overcoming breastfeeding problems, GMP, men's involvement in breastfeeding and child care, child spacing, point-of-use water treatment and safe water sources, proper disposal of feces, malaria transmission and prevention, malarial danger signs and treatment, and home care. The fourth module, also titled "Essential Nutrition, Hygiene, and Care Practices during Infancy," has seven lessons largely focused on nutrition, including complementary feeding for children between 6 and 8 months of age, 9 and 11 months of age, and 12 and 23 months age; preparing CSB with local foods; the importance of vitamin A and good food sources of vitamin A; worms and de-worming medication; and preparing, cooking, and storing foods. The final, fifth module, "Management of Childhood Infections," contains six lessons related to the signs and dangers of child dehydration, dehydration prevention using oral rehydration salts, proper feeding of sick children, dysentery and persistent diarrhea, pneumonia prevention, and developing a kitchen garden.

3.3.2. Results Related to the Knowledge–Adoption of Essential Nutrition and Hygiene Practices Pathway

Catholic Relief Services Hires Local Health Promoters

All of the interviewed THP were hired by CRS between September and November 2009 prior to the program's start date of April 2010. The Tubaramure consortium requested each commune's development committee to submit the names of nine potential candidates for the position of THP; after interviewing each candidate, three THP were hired per commune. The THP confirmed that their skills were tested (9/10, 90%) and that they were interviewed prior to being hired (6/10, 60%). Their motivations for choosing this job were primarily financial (6/10, 60%), but some had previous experience in public health and adult education and were eager to work in this field again (4/10, 40%).

All THP interviewed felt comfortable performing their job. Health promoters mentioned that they were equipped with the necessary skills from training (2/10, 20%) or that they had the necessary experience to fulfill their duties (4/10, 40%). Many stated that they were content seeing changes within their respective communities (7/10, 70%) and three specifically mentioned the joy of seeing the children they work with in good health. To increase their comfort level, THP suggested a lighter workload (1/10, 10%) and increased salary (3/10, 30%), more materials and improved office space (4/10, 40%), an opportunity to voice their concerns (2/10, 20%), roof coverings for outdoor care group meetings (2/10, 20%), multiple sessions to teach one lesson (1/10, 10%), and greater community sensitization regarding the Tubaramure objectives to let community members know that it is more than just food distribution (1/10, 10%).

Tubaramure Health Promoters Are Trained on BCC Lessons

Health promoters had received an average of 10 training sessions during their 2.1 years of employment. In response to open-ended questions, they reported that their training focused on the Essential Nutrition

Actions (ENA), such as breastfeeding, food groups, and dietary diversity (9/10, 90%); Essential Hygiene Actions (EHA) (3/10, 30%); culinary demonstrations (5/10, 50%); adult education methods (2/10, 20%); and the importance of pre- and postnatal consultations (6/10, 60%). Training was delivered by CRS, FH, and IMC.

Tubaramure Health Promoters Train Leader Mothers on BCC Lessons

Health promoters reported that they taught an average of 10 (SD 6) LMCG over the past 4 months. These LMCG were typically held within structures providing shelter, such as community field huts, schools, watchmen alcoves, or health centers, but were also conducted at outdoor venues, such as churches and open fields, where they were vulnerable to rain.

Attendance and Time Commitment for Observed Leader Mother Care Groups

The Tubaramure program intended for THP to teach LMCG of 10–12 participants each. The observed LMCG averaged 13 leader mothers each, but could have as many as 28 leader mothers in attendance. At least one leader mother arrived late to almost all of the observed LMCG (11/12, 92%). Every LMCG had at least three, and an average of nine, children under 5 years of age in attendance; older children were less likely to attend. During the observations, men from the community also attended LMCG (**Table 3.23**). On average, the sessions lasted about 1 hour and 26 minutes, but for leader mothers that arrived on time, the time commitment could be longer since leader mothers arriving late often delayed the start of the care group (Table 3.23). The average total time commitment (not including travel time) was 2 hours, 37 minutes.

Table 3.23. Attendance at and Time Commitment to Participate in LMCG[i]

	Observed LMCG (n = 12)
Attendance	
Number of leader mothers in attendance	13 (6)
Number of leader mothers that arrived after the lesson start time	2 (2)
Number of children < 5 years present	9 (5)
Number of children 5–10 years present	1 (2)
Number of children 10–15 years present	1 (3)
Number of adult men > 15 years present	2 (3)
Time	
Gap between arrival time of first leader mother and actual start time	1 hr 15 min (44 min)[ii]
Duration of LMCG	1 hr 26 min (31 min)
Average total time commitment	2 hr 37 min (59 min)[ii]

[i] Numbers are presented as mean (SD).
[ii] n = 11.

Quality of Leader Mother Care Groups Provided by Tubaramure Health Promoters

Overall, LMCG were well managed by THP, were interactive, allowed leader mothers a chance to practice their skills, and kept the leader mothers' interest throughout the sessions (**Table 3.24**). Health

promoters were dynamic in their facilitation of LMCG and always communicated the lesson's correct technical content (according to that outlined in the modules). Sessions typically began with an introductory game to energize the group. To facilitate the session, THP always defined the lesson at hand and almost always spoke loudly and clearly when educating leader mothers. The majority of THP created a participatory environment by using open-ended questions and having the leader mothers practice teaching the lessons they had learned. The THP observed used many didactic teaching methods and used most of the relevant illustrations, but were not solely reliant on these images. Most leader mothers committed to making the behavior change requested of them (Table 3.24).

Table 3.24. Quality of Education Provided during Observed LMCG[i]

	Observed LMCG (n = 12)
Session management	
Had all teaching materials ready for use	10 (83%)
Took attendance	10 (83%)
Completed all of the learning session steps	9 (75%)
Facilitation and teaching skills	
Played introductory game	9 (75%)
Ensured that all participants could see the visual materials	10 (83%)
Clearly defined question/topic to be discussed	12 (100%)
Used open-ended questions to encourage participation	10 (83%)
Had leader mothers practice teaching the lesson	8 (67%)
Asked participants if they had any questions	11 (92%)
Participants asked questions related to the lesson	7 (58%)
Requested a commitment from participants regarding the new lesson	12 (100%)
Attitudes displayed	
Provided praise or affirmation to participants	10 (83%)
Demonstrated respect for participants	11 (92%)
Helped participants feel at ease with participating	12 (100%)
Attempted to create a dialogue and/or limit lecture style	10 (83%)
General atmosphere	
Participants appeared comfortable	11 (92%)
Laughter was present during the session	7 (58%)
Distracting side-conversations were present during the session	5 (42%)
Distracting children were present during the session	8 (67%)
Mothers appeared bored during the session	0 (0%)

[i] Numbers are presented as n (%).

Topics Taught at the Observed Leader Mother Care Groups

A variety of lessons were taught by the THP at the observed LMCG, but most came from Modules 2 and 3 of the materials created by FH; the remaining sessions were culinary demonstrations (**Table 3.25**). A little more than half of the leader mothers interviewed following the LMCG said that they easily understood their lessons (14/24, 58%). Half of the women that received the lesson about resting after birth specifically mentioned that this topic was easy to understand. The leader mothers that had participated in cooking demonstrations found them to be helpful and reported that these demonstrations helped them understand how to prepare the CSB and how to use the correct quantities of CSB, oil, and vegetables when making porridge. They felt confident that they could prepare the recipes they learned at home. The only thing that they reported that would keep them from being able to do so was access to the necessary ingredients and supplies.

Table 3.25. Topics Discussed during Observed LMCG[i]

	Observed LMCG (n = 12)
Module 2 lessons	
Antenatal care	1 (8%)
Creation of household washing station	1 (8%)
Immediate breastfeeding at birth and use of colostrum	1 (8%)
Newborn care practices	2 (17%)
Module 3 lessons	
Postpartum care	4 (33%)
Other lessons	
Culinary demonstration	3 (25%)

[i] Numbers are presented as n (%).

Leader Mothers' Perceived Understanding of Topics Covered during the Observed Leader Mother Care Groups

The THP's teaching styles reportedly helped leader mothers understand the lessons (12/24, 50%). One-third of the leader mothers specifically stated that the lesson was clear (8/24, 33%), and therefore easy to understand. Only three women reported that there was a lesson that was hard to understand. Of the three, two of the women did not understand well the lesson about resting after giving birth, and the other woman did not understand well how to prepare CSB with other foods like vegetables. Nevertheless, all of the leader mothers found the lessons helpful.

Leader Mothers' Perceived Ability to Teach the Topics Covered during the Observed Leader Mother Care Groups

After learning the lessons themselves, the leader mothers are expected to teach the lessons to the beneficiary mothers. In response to open-ended questions, about half of the women interviewed following their LMCG believed that they could teach the whole lesson they had just learned (13/24, 54%). Others mentioned that they would be able to teach specific topics they learned, such as preparing the CSB (6/24, 25%), hygiene (5/24, 21%), and caring for a newborn (4/24, 17%). Leader mothers explained that it was

easy for them to teach the lessons when they had the necessary teaching materials (19/24, 79%) and understood the lesson themselves (9/24, 38%). One leader mother also specifically mentioned that teaching the lesson to the beneficiary mothers shortly after the LMCG with the THP helped her to teach the lesson.

Only one of the 24 leader mothers interviewed following her LMCG reported that teaching the beneficiary mothers how to prepare the CSB mixed with vegetables was difficult because of a lack of CSB, vegetables, pots, and spoons.

To help further facilitate their teaching efforts, the leader mothers asked that the teaching materials be readily available (10/24, 42%). One leader mother mentioned that if the beneficiaries were literate, it would help her teach the lesson better. Another leader mother suggested that having the THP around while she teaches would help her as well.

Interactions between Leader Mothers and Tubaramure Health Promoters

All of the leader mothers interviewed had positive things to say with regard to their relationship with their respective THP. All of the women interviewed following their LMCG felt respected by their THP. When asked for reasons why they felt this way, leader mothers explained that the THP taught with kindness (14/24, 58%), never cursed at the mothers (11/24, 46%), and answered their questions (6/24, 25%). Half of the women mentioned that they were pleased that their THP taught them well (12/24, 50%) and that they visited them at home (5/24, 21%). Some leader mothers also mentioned that their THP never missed a meeting, which they appreciated (4/24, 17%). All of the leader mothers explained that they believed what the THP taught them; because they used the module book, the lessons must be true. They also have seen improvements in their own (20/24, 83%) and their children's (2/24, 8%) health, which they attributed to the lessons they learned at their LMCG. The majority of women were also positive about their relationships with the other leader mothers in their care groups (21/24, 88%). Some of them said that they help each other (8/24, 33%), discuss how to teach their beneficiary mothers (6/24, 25%), and visit each other at home (4/24, 17%).

The good relationship between the THP and leader mothers, and among the leader mothers themselves, likely facilitated leader mother participation in their LMCG (24/24, 100%). When asked why they participated in their LMCG, many said that they were free to ask and answer questions during these meetings, which made them feel comfortable participating (17/24, 71%). They also explained that they felt at ease because they were all women, making them comfortable to share their problems (7/24, 29%). One leader mother also mentioned that she enjoyed playing a game in the beginning because it gave her the courage and morale to get through the lesson.

Leader Mothers' Opinions about Participating in Leader Mother Care Groups

All of the leader mothers interviewed following their LMCG reportedly enjoyed participating in their meetings and planned to attend the next meeting. The majority of these leader mothers also stated that they have the support of their husbands to attend (17/22, 77%). Leader mothers mentioned that their husbands appreciate the program and what it teaches the women (7/22, 32%). While learning was the main reason leader mothers mentioned for their participation in the LMCG (24/24, 100%), a few also mentioned the importance of the social aspect of the meetings, explaining that it is an opportunity for them to gather with their friends (4/24, 17%). In addition, some of the leader mothers went on to say that they enjoy participating in these meetings because they have seen the positive impacts the lessons have on their households (7/24, 29%); some of their husbands reportedly observed the same positive impacts (7/22, 32%). Almost all of the leader mothers were enthusiastic about their participation in their care

group meetings; even the one mother who said that she had learned nothing from the Tubaramure program did not state that she disliked attending the meetings.

Leader Mothers Teach Their Beneficiary Mother Care Groups

On average, the 24 leader mothers interviewed at the BMCG had participated in the Tubaramure program for more than 1 year (13.8 months), obtained the position of leader mother within 1 month of registration (0.7 months), attended their first LMCG during their second month in the program (1.6 months), and taught their first BMCG after completing 2 months in the program (2.0 months). The majority of the leader mothers were chosen to be in their leadership positions by their fellow beneficiary mothers, as intended by the program design (21/24, 88%). Some mothers said that they were chosen because they were literate (5/24, 21%) and one leader mother mentioned that she was chosen to replace a leader mother who was doing a poor job. Leader mothers accepted the position because they felt that the other mothers had put their trust in them (12/24, 50%) and because they wanted to help others (10/24, 42%). Leader mothers were also interviewed following the LMCG (n = 24) and at their homes (n = 24), and gave similar responses regarding length of participation in the program and reasons for being elected and for taking on the role of leader mother.

Participation in Beneficiary Mother Care Groups among Beneficiary Mothers Interviewed at Home

All of the beneficiary mothers interviewed at home had attended at least one BMCG since joining Tubaramure (**Table 3.26**). In response to open-ended questions, those interviewed said that they participated in the meetings to learn in general (36/72, 50%), to specifically learn about child nutrition and hygiene (5/72, 7%), or to learn about mother's nutrition (2/72, 3%). Other reasons that were mentioned for participating in the meetings were to learn about the program itself (11/72, 15%) and because the information received during the meetings was believed to be very useful (14/72, 19%).

Beneficiary mothers interviewed at home that had been enrolled in the program for more than 4 months had attended only an average of 5.1 BMCG over the past 4 months, just a little more than half of those intended by the program design; only one out of four beneficiary mothers had attended the eight required sessions (Table 3.26).

Although some of the mothers interviewed at home mentioned that to miss a BMCG a mother must have a solid excuse (14/72, 19%), a little more than half of the women interviewed had missed at least one BMCG since joining Tubaramure (Table 3.26). A number of beneficiary mothers mentioned that with a valid excuse, their leader mother would go over the missed lesson afterwards (13/72, 18%). Some beneficiary mothers also relied on their fellow beneficiaries to explain what the missed lesson was about (9/72, 13%).

Table 3.26. Attendance at BMCG by Beneficiary Mothers Interviewed at Home[i]

	Beneficiary mothers (n = 72)
Attended at least one BMCG	72 (100%)
Missed at least one BMCG	37 (51%)
Number of BMCG attended over the past 4 months (among beneficiaries that have been with the program for at least 4 months)	5.1 (3.0)[ii]
Attended 8 BMCG over the past 4 months (among beneficiaries that have been with the program for at least 4 months)	14 (26%)[ii]

[i] Numbers are presented as n (%) or mean (SD).
[ii] n = 54.

Location of Observed Beneficiary Mother Care Groups

BMCG were typically held outside in open fields on clear days, and sometimes even when it rained. Other common venues were leader mother homesteads and schools. Less common locations included an outdoor church, a community field hut, an adult education house, and even an abandoned bar found in haste during a rain storm. The majority of leader and beneficiary mothers interviewed were satisfied with the location of their meetings. Those that were not satisfied mentioned the location not being covered as their primary concern. The importance of areas being covered was mentioned throughout the interviews, as bad weather conditions can often disrupt a meeting. One leader mother complained that "if it rains, the meeting stops."

Attendance and Time Commitment for Observed Beneficiary Mother Care Groups

Like LMCG, BMCG were intended to have between 10 and 12 members. Although the observed BMCG ranged in size from 3 to 17 beneficiary mothers, on average, they had 8 beneficiary mothers in attendance; the two largest groups resulted from combining two neighboring BMCG. Groups reportedly sometimes joined together to provide beneficiary mothers with a different leader mother's perspective. At about half of the observed BMCG, the lesson did not begin until everyone had arrived (13/23, 57%); typically one beneficiary mother arrived late to a BMCG. On average, the number of beneficiary mothers and the number of children under 5 years of age in attendance were the same. On average, the BMCG observed welcomed one (and sometimes up to five) non-beneficiaries, which confirmed reports that these sessions functioned as a social event for women in the community. Older children and adult men were unlikely to attend BMCG (**Table 3.27**).

Beneficiary mothers spent up to an average of 1 hour waiting for their group members to arrive and for the lesson to begin. The majority of BMCG started between 11:00 am and 1:00 pm. BMCG lessons typically lasted about three-quarters of an hour, but could be as short as 10 minutes. The total time commitment (i.e., wait time plus lesson) across the observed BMCG averaged less than 2 hours (Table 3.27). The majority of the women interviewed following the BMCG and at home said that they were happy with the amount of time their meetings lasted (38/48, 79% interviewed after the meeting; 60/72, 83% interviewed at home). A fraction of the women interviewed following the BMCG (but none of the beneficiary mothers interviewed at home) said the meeting was too long and that they learned too many things in one meeting (3/48, 6%). The remainder of the women complained that their meetings were too short (7/48, 15% interviewed after the meeting; 12/72, 17% interviewed at home). Leader mothers held similar views about the length of the meetings, with most mentioning that it was an okay amount of time (19/24, 79%), but others being concerned that the time was too short (4/24, 17%), that the beneficiaries did not understand everything, and that they did not have a chance to participate.

Table 3.27. Attendance at and Time Commitment to Participate in Observed BMCG[i]

	Observed BMCG (n = 23)
Attendance	
Number of beneficiary mothers in attendance	8 (4)
Number of beneficiary mothers that arrived after the lesson start time	1 (2)
Number of children < 5 years present	8 (3)
Number of children 5–10 years present	0 (1)
Number of children 10–15 years present	0 (0)
Number of adult men > 15 years present	0 (0)
Number of non-beneficiary women > 15 years present	1 (1)
Time	
Gap between arrival time of first beneficiary mother and lesson start time	1 hr 01 min (43 min)
Duration of BMCG	43 min (28 min)
Average total time commitment	1 hr 45 min (54 min)

[i] Numbers are presented as mean (SD).

Quality of Observed Beneficiary Mother Care Groups Provided by Leader Mothers

Observations of the BMCG showed that leader mothers were much more timid and unsure in their facilitation of BMCG than the THP had been in the observed LMCG. Although nearly all of the leader mothers observed had the BCC modules available to use and relied on illustrations to communicate the lessons, most did not follow all of the steps outlined for the lessons observed (**Table 3.28**). For example, most did not open the BMCG with an introductory game, did not clearly define the topic that would be presented, and did not request a commitment from the beneficiary mothers for behavior change. In addition, only about half of the leader mothers communicated all of the lesson's correct technical information according to the outlined lesson. The majority of leader mothers encouraged participation via open-ended questions, but fewer than one-third specifically asked their beneficiary mothers if they had questions, and beneficiaries rarely posed questions themselves. Furthermore, at about one-third of the observed BMCG, some of the mothers appeared bored (Table 3.28).

Table 3.28. Quality of Education Provided during Observed BMCG[i]

	Observed BMCG (n = 23)
Session management	
Had all teaching materials ready for use	22 (96%)
Took attendance	2 (9%)
Completed all of the learning session steps	1 (4%)
Facilitation and teaching skills	
Played introductory game	9 (39%)
Ensured that all participants could see the visual materials	20 (87%)
Clearly defined question/topic to be discussed	7 (30%)
Used open-ended questions to encourage participation	14 (61%)
Teacher asked participants if they had any questions	7 (30%)
Participants asked teacher questions related to the lesson	3 (13%)
Requested a commitment from participants regarding the new lesson	2 (9%)
Attitudes displayed	
Provided praise or affirmation to participants	4 (17%)
Demonstrated respect for participants	20 (87%)
Helped participants feel at ease with participating	8 (35%)
Attempted to create a dialogue and/or limit lecture style	17 (74%)
General atmosphere	
Participants appeared comfortable	14 (61%)
Laughter was present during the session	6 (26%)
Distracting side-conversations were present during the session	4 (17%)
Distracting children were present during the session	13 (57%)
Mothers appeared bored	8 (35%)

[i] Numbers are presented as n (%).

Although leader mothers were given some training on teaching methods to use in their BMCG and were provided with good examples of how to teach through the THP's facilitation of their LMCG, it is clear that they could benefit from more training in the didactics of adult education, in addition to continued technical training. At BMCG, like LMCG, the presence of children distracted mothers from paying attention. The majority of the beneficiary mothers interviewed following the BMCG felt that it was necessary to have their children under 2 years of age with them, because they were too young to be left with others or because they had no one else to leave them with while they attended the sessions. Although many mentioned that this was distracting, they also thought it was the best choice given the circumstances.

Topics Taught at the Observed Beneficiary Mother Care Groups

Among the 23 BMCG observed, most sessions were spent learning lessons from Module 2. The BCC lesson on newborn care practices was taught during 10 of the observed sessions (**Table 3.29**), but almost half (4/10, 40%) of the time it was taught in conjunction with an earlier lesson. The majority of beneficiaries interviewed following their BMCG said that none of the topics they learned were difficult to understand (33/42, 79%), although a couple of mothers found the topics related to hygiene and what not to feed a baby difficult to understand.

Table 3.29. Topics Discussed during Observed BMCG[i]

	Observed BMCG (n = 23)
Module 1 lessons	
Care Group Orientation	1 (4%)
Module 2 lessons	
Antenatal care and health center births	3 (13%)
Maternal nutrition	1 (4%)
Handwashing practices	5 (22%)
Creation of household handwashing stations	3 (13%)
Malaria prevention	2 (9%)
Preparing for delivery and birth[ii]	2 (9%)
Immediate breastfeeding and use of colostrum[ii]	2 (9%)
Newborn care practices[iii]	10 (43%)
Module 3 lessons	
Improved water source	1 (4%)

[i] Numbers are presented as n (%).
[ii] The "Preparing for delivery and birth" lesson was always taught during the same care group session as the lesson on "Immediate breastfeeding and use of colostrum."
[iii] The "Newborn care practices" lesson was sometimes taught in addition to other lessons, such as those on antenatal care, handwashing practices, malaria prevention, preparing for delivery and birth, and immediate breastfeeding and use of colostrum.

Beneficiary Mothers' Perceived Understanding of Topics Covered during the Observed Beneficiary Mother Care Groups

When asked open-ended questions after their BMCG regarding what helped them understand the lesson, one-third of the beneficiary mothers mentioned that the pictures that they were shown helped them understand the lesson that was presented (14/48, 29%). Some said that it would help them more if they could see all of the images well (6/44, 14%), indicating that this was not always the case. This is in agreement with observations made during the BMCG (Table 3.28). One person mentioned that it was harder for her to understand the messages when she heard them for the first time, and some of the beneficiaries specifically mentioned that reviewing the topic helps them understand the topics (11/48, 23%). Others noted the importance of the leader mother's teaching style in facilitating their understanding

(11/48, 23%), highlighting the importance of leader mothers learning not only the technical content but also how to teach adults.

Cooking Demonstrations

Although no cooking demonstrations were held at any of the observed BMCG, more than half of the beneficiary mothers interviewed at home said that they had participated in one at some point since joining the Tubaramure program (43/72, 60%). The women that had participated in a cooking demonstration all found the demonstrations to be helpful because they learned how to better prepare food (16/43, 37%) and, specifically, because it showed them how the CSB is supposed to be prepared (15/43, 35%) and the correct quantities of CSB to prepare (5/43, 12%). Some of the beneficiary women also mentioned that they enjoyed learning how to cook more diverse and mixed meals (9/43, 21%). All of the women that participated in a cooking demonstration reported that they had been able to prepare the recipes at home. The most common barriers reported to preparing the recipes at home were lack of access to the food or materials necessary (10/43, 23%) or forgetting how to prepare the recipes (4/43, 9%).

Interactions between Beneficiary Mothers and Leader Mothers and among Beneficiary Mothers

Beneficiary mothers had mostly positive things to say about their relationships with their leader mothers and with their fellow beneficiary mothers. Leader mothers also shared this view, noting that their interactions with the beneficiary mothers were positive and that they generally felt respected and supported by the beneficiary women in their groups. Some of the leader mothers said that they also helped each other when necessary (5/24, 21%). As one leader mother explained, “If I have a problem, one of the beneficiaries goes to the care group meeting with the health promoter for me.” Notwithstanding the overwhelming positive feedback, a few beneficiaries did note that they did not think that their leader mother taught them well. Nearly half of the beneficiaries interviewed at home mentioned that some of their fellow beneficiaries did not attend their BMCG (29/72, 40%).

Given the level of respect and interaction between the leader mother and her beneficiary mothers, it is not surprising that almost all of the women interviewed following their BMCG (43/48, 90%) and at home (63/71, 89%) felt comfortable participating in the BMCG. These mothers explained that they felt comfortable participating because they could ask questions when they did not understand something, because the lessons were interactive, and because the leader mothers let the beneficiaries know when something they said or did was wrong. The few people that did not feel comfortable participating mainly said that it was either because they were new to the program, because they were afraid to answer incorrectly, or because the leader mother did not encourage participation by posing questions.

Beneficiaries’ Confidence in What the Leader Mothers Teach Them

An overwhelming majority of the beneficiary mothers interviewed following their BMCG (44/48, 92%) or at home (64/71, 90%) reported that they had confidence in what their leader mothers taught them. In response to open-ended questions, many beneficiaries explained that they believed what they were taught because they had already seen the positive impact of the messages on their lives. Interestingly, the proportion of mothers reporting positive impacts was larger in the group interviewed after the BMCG (33/44, 75%) than in the group of women visited at home (25/64, 39%). Some of the beneficiaries also mentioned that since the leader mother taught from the book provided by Tubaramure, the lessons must be true. As one mother put it, “She [the leader mother] doesn’t invent the lessons; she reads what is written.”

Leader and Beneficiary Mothers' Opinions about Teaching and Participating in Beneficiary Mother Care Groups

Overall, leader mothers enjoyed teaching their BMCG and all planned to teach the next one (24/24, 100%). Likewise, all of the beneficiary mothers enjoyed participating in the BMCG and planned to attend the next scheduled meeting (48/48, 100%). The beneficiary women interviewed following the BMCG explained that they enjoyed participating because they learned new things (40/48, 83%), because they got to be with other beneficiary mothers (11/48, 23%), and because the Tubaramure program helped their families (10/48, 21%). These beneficiaries went on to say that the lessons learned during the BMCG increased their knowledge (29/48, 60%), improved their lives (16/48, 33%), and improved their children's health (10/48, 21%). Some also specifically said that the lessons they learned at the BMCG helped them change their behaviors (9/48, 19%). One such changed behavior was giving alcohol to babies; one beneficiary said the BCC lesson about the disadvantages of giving alcohol to babies helped her stop.

The beneficiary women interviewed following their BMCG also explained that they enjoyed the support of their husbands to participate in their BMCG. In response to open-ended questions, some beneficiary mothers reported that their husbands encouraged them to go to their BMCG (15/48, 31%), while some simply said that their husbands give them permission to go (9/48, 19%). As explained by one beneficiary, "He allows me to forego all my other work so that I can attend [the meeting]." Some of the beneficiaries reported that they shared with and/or taught their husbands what they learned (4/48, 8%). A few also mentioned that their husbands helped implement the lessons taught in the program, such as building a bathroom or washing station (3/48, 6%).

Although both leader and beneficiary mothers generally had positive things to say about the LMCG and BMCG, and planned to continue to teach and/or participate in the meetings, some did mention that the meetings sometimes interfered with other activities. Eight of the 24 leader mothers interviewed following the BMCG said that teaching the meetings interfered with their other activities, including farming (8/8, 100%), cooking and cleaning (4/8, 50%), and getting water (2/8, 25%). Five of these leader mothers skipped doing the affected activity (5/8, 63%), while two chose to postpone the affected activity to later in the day (2/8, 25%). One leader mother said that her husband had to work by himself in the field while she taught her BMCG. Beneficiary mothers were similarly affected by participating in the BMCG. Ten of the 48 interviewed following their BMCG said that their other activities were affected and again mentioned farming (10/10, 100%) and cooking and cleaning (4/10, 40%). They also mainly chose to skip the activity for the day (9/10, 90%) and two said they fulfilled their duties once they returned from the BMCG (20%).

Leader and Beneficiary Mothers' Suggestions to Improve Their Beneficiary Mother Care Groups

Leader mothers interviewed following the BMCG and beneficiary mothers interviewed at home had two primary recommendations for improving the BMCG. First, they both wanted to be notified more in advance as to when the BMCG would be held (3/24, 13% of leader mothers; 13/72, 18% of beneficiary mothers) and, second, they wanted to have more time for meetings or more frequent meetings so that they had time to cover the lessons (4/24, 17% of leader mothers; 9/72, 13% of beneficiary mothers). One leader mother suggested that, "We should have meetings at least three times per month so that the beneficiary mothers can understand well." A few of the leader mothers also asked to be compensated for teaching the BMCG (3/24, 13%).

Health and Nutrition Knowledge among Tubaramure Health Promoters, Leader Mothers, and Beneficiary Mothers

Health promoters, leader mothers, and beneficiary mothers were well versed in the timing and frequency of prenatal care visits. On average, they reported that prenatal visits should begin during the third month

of pregnancy and that women should attend four prenatal visits (**Table 3.30**). The THP, leader mothers, and beneficiary mothers were also very aware that vaginal bleeding and severe stomach aches were danger signs during pregnancy that require immediate medical attention. Beneficiary mothers were less likely to report severe headaches and persistent vomiting as additional danger signs. This indicates that they had retained some, but not all, of the messages related to danger signs during pregnancy.

Table 3.30. Comparison of Prenatal Care Knowledge between THP, Leader Mothers, and Beneficiary Mothers[i]

	THP (n = 10)	Leader mothers (n = 24)	Beneficiary mothers (n = 72)
Prenatal care visits			
Total number of visits recommended	4.0 (0.0)	4.3 (1.1)	4.5 (1.4)
Danger signs of pregnancy; % that said:			
Vaginal bleeding	10 (100%)	22 (92%)	60 (83%)
Severe headaches	10 (100%)	18 (75%)	32 (44%)
Severe stomach aches	10 (100%)	18 (75%)	58 (81%)
Persistent vomiting	8 (80%)	13 (54%)	10 (14%)

[i] Numbers are presented as n (%) or mean (SD).

Danger signs during childhood were considerably less well known than those during pregnancy, especially among leader and beneficiary mothers. The only danger sign during childhood that was cited by the vast majority of THP, leader mothers, and beneficiary mothers was fever. While the majority of THP mentioned bloody stools, the inability to drink, and rapid breathing as symptoms requiring immediate medical attention, fewer than half of the leader and beneficiary mothers cited these same symptoms as danger signs, with the exception of bloody stools, which was mentioned by about half of the beneficiary mothers (**Table 3.31**). Only half of the THP listed the intensification of symptoms and difficulty breathing as danger signs, and almost none of the leader or beneficiary mothers cited these same danger signs.

Knowledge regarding the treatment of diarrhea was high among THP and leader mothers; almost all of them knew that oral rehydration salts could be used to treat diarrhea. However, only about half of the beneficiary mothers were able to explain that oral rehydration salts could be used to treat diarrhea. Regarding the nutritional needs of sick children, knowledge was very high among THP but decreased along the knowledge dissemination chain. While the majority of program staff and participants knew that sick children required more breast milk, only the majority of THP knew they also required more food and liquids. This same trend was observed regarding the nutritional needs of children during convalescence (Table 3.31). Participants appeared unfamiliar with the BCC lessons regarding the proper feeding of sick children and those recovering from illness, which should be taught in Module 5 of the FH BCC materials.

The knowledge that newborns should be breastfed immediately after birth and fed colostrum was ubiquitous across THP, leader mothers, and beneficiary mothers. On average, THP, leader mothers, and beneficiary mothers recommended breastfeeding a child until 24 months of age or longer; this finding satisfies the WHO international recommendation of continued breastfeeding for the first 2 years of life and beyond for optimal child health outcomes (Pan American Health Organization [PAHO]/WHO 2003).

Table 3.31. Comparison of Health Care Knowledge Regarding Childhood Illness between THP, Leader Mothers, and Beneficiary Mothers[i]

	THP (n = 10)	Leader mothers (n = 24)	Beneficiary mothers (n = 72)
Danger signs of childhood illness; % that said:			
Cannot drink/breastfeed	7 (70%)	11 (46%)	16 (22%)
Symptoms intensify	5 (50%)	2 (8%)	10 (14%)
Fever	9 (90%)	19 (79%)	57 (79%)
Rapid breathing	6 (60%)	1 (4%)	3 (4%)
Trouble breathing	5 (50%)	2 (8%)	4 (6%)
Bloody stools	9 (90%)	5 (21%)	37 (51%)
Treating diarrhea; % that knew:			
The purpose of oral rehydration salts	9 (90%)	21 (88%)	42 (58%)
Feeding a sick child; % that knew:			
To give more food	10 (100%)	9 (38%)	11 (15%)
To give more liquids	9 (90%)	9 (38%)	20 (28%)
To give more breast milk	10 (100%)	20 (83%)	39 (54%)
Feeding a child immediately following recovery; % that knew:			
To give more food	10 (100%)	7 (29%)	24 (33%)
To give more liquids	10 (100%)	9 (38%)	17 (24%)
To give more breast milk	10 (100%)	20 (83%)	40 (56%)

[i] Numbers are presented as n (%).

Appropriate complementary feeding practices, on the other hand, were not as well understood as breastfeeding practices. Although nearly everyone knew that children should not be given liquids or foods other than breast milk until 6 months of age, many people, especially beneficiary mothers, stated that complementary foods should not be introduced until after 6 months of age. Leader and beneficiary mothers, on average, both said that children 1 year of age should be given only three meals per day, which meets the recommended minimum meal frequency for this age group (WHO 2008), but is fewer than the four or five meals recommended by the FH BCC messages (**Table 3.32**). Knowledge regarding micronutrient-rich foods and the consequences of vitamin A and iron deficiency was also limited among those interviewed (data not shown).

Table 3.32. Comparison of Breastfeeding and Complementary Feeding Knowledge among THP, Leader Mothers, and Beneficiary Mothers[i]

	THP (n = 10)	Leader mothers (n = 24)	Beneficiary mothers (n = 72)[ii]
Breastfeeding			
Baby should be breastfed immediately (< 1 hr) after birth	10 (100%)	24 (100%)	71 (99%)
Age of introduction of liquids			
Before 6 months	0 (0%)	0 (0%)	3 (4%)
At 6 months	10 (100%)	19 (79%)	58 (81%)
After 6 months	0 (0%)	5 (21%)	10 (14%)
Age of introduction of complementary food			
Before 6 months	0 (0%)	0 (0%)	2 (3%)
At 6 months	7 (70%)	16 (67%)	22 (31%)
After 6 months	3 (30%)	8 (33%)	48 (67%)
Appropriate meal frequency			
Children 6.0–8.9 months	3.9 (1.0)	2.8 (0.7)	2.7 (0.8)[iii]
Children 1 year of age	4.0 (0.8)	3.0 (0.7)	2.9 (0.8)

[i] Numbers are presented as n (%) or mean (SD).
[ii] Maximum sample size presented.
[iii] n = 71.

Hygiene knowledge in relation to handwashing was high and fairly similar across the THP, leader mothers, and beneficiary mothers interviewed. All mothers knew that soap should be used for handwashing, and the majority understood the importance of this practice in relation to food preparation and after they had defecated. However, only about half of the leader mothers and fewer than one-third of the beneficiary mothers correctly stated that it was important to wash one's hands after cleaning a child who had defecated (**Table 3.33**). Almost all THP and leader mothers mentioned boiling water as an appropriate purification method, but only about 60 percent of beneficiary mothers also cited this method (Table 3.33).

Table 3.33.Comparison of Hygiene Knowledge between THP, Leader Mothers, and Beneficiary Mothers[i]

	THP (n = 10)	Leader mothers (n = 24)	Beneficiary mothers (n = 72)
Timing for handwashing			
Before eating	7 (70%)	17 (71%)	50 (69%)
After using the bathroom	10 (100%)	23 (96%)	65 (90%)
Before feeding a child	10 (100%)	17 (71%)	54 (75%)
After cleaning a child who defecated	10 (100%)	13 (54%)	22 (31%)
Handwashing products			
Soap	10 (100%)	24 (100%)	72 (100%)
Ash	10 (100%)	19 (79%)	39 (54%)
Water purification methods			
Boiling	9 (90%)	23 (96%)	44 (61%)
Chlorine	2 (20%)	1 (4%)	0 (0%)

[i] Numbers are presented as n (%).

Feeding, Care, and Health Practices among Leader and Beneficiary Mothers

Leader and Beneficiary Mothers' Perceived Ability to Implement Lessons Learned in Their Care Groups

Better maternal knowledge is an important goal of the Tubaramure's BCC component, but improved nutrition and health outcomes ultimately depend on leader and beneficiary mothers being able to implement what they learn. An overwhelming majority of both leader and beneficiary mothers reported that they would be able to implement at least some of the lessons that they had learned at their care group meetings (**Table 3.34**). Hygiene, which includes washing hands using a tippy tap (a hands-free handwashing station that uses a recycled plastic bottle or jug), was the lesson most often mentioned as being implementable by both leader and beneficiary mothers. Beneficiary mothers interviewed at home especially focused on building the hygiene-related items promoted by Tubaramure, including a dish drying rack, latrine, and handwashing station. Other lessons that leader and beneficiary mothers mentioned as being feasible for implementation at home included taking care of a newborn, resting after child birth, and taking a sick child to the hospital. Understanding the lessons and reviewing lessons at their care group meetings or with their leader mothers or THP, having the necessary materials, and having support from their husbands were the things that were reported as being most likely to help beneficiary and leader mothers implement the lessons that they learned during their care group meetings (Table 3.34).

Table 3.34. Leader and Beneficiary Mothers' Ability to Implement Lessons Learned at Their Care Groups, and Factors That Help Implementation[i]

	Leader mothers interviewed at:		Beneficiary mothers interviewed at:	
	LMCG (n = 24)	BMCG (n = 24)	BMCG (n = 47)	Home (n = 72)
Believed they could implement lessons learned	24 (100%)	22 (92%)	46 (98%)	68 (94%)
Lessons that they could implement[ii]				
Hygiene	16 (67%)	10 (42%)	18 (38%)	35 (49%)
Building a handwashing station	0 (0%)	0 (0%)	0 (0%)	28 (39%)
Building a latrine	0 (0%)	0 (0%)	0 (0%)	29 (40%)
Building a dish drying rack	0 (0%)	0 (0%)	5 (11%)	21 (29%)
Immediate breastfeeding	0 (0%)	5 (21%)	4 (9%)	0 (0%)
Resting after child birth	8 (33%)	0 (0%)	0 (0%)	0 (0%)
Taking care of a newborn	0 (0%)	6 (25%)	16 (34%)	0 (0%)
Taking a sick child to the hospital	9 (38%)	0 (0%)	14 (30%)	0 (0%)
Attending prenatal consultations	3 (13%)	0 (0%)	0 (0%)	0 (0%)
Attending postnatal consultations	3 (13%)	0 (0%)	0 (0%)	0 (0%)
Nutrition and feeding for children	0 (0%)	0 (0%)	5 (11%)	8 (11%)
Factors that help mothers implement lessons learned[ii]				
Understanding the lesson well	0 (0%)	0 (0%)	8 (17%)	7 (10%)
Reviewing the lessons	5 (21%)	4 (17%)	3 (6%)	0 (0%)
Attending all care group meetings	0 (0%)	0 (0%)	7 (15%)	0 (0%)
Having the necessary materials (such as soap, food, and books)	9 (38%)	0 (0%)	3 (6%)	37 (51%)
Having transportation means	0 (0%)	3 (13%)	0 (0%)	0 (0%)
Having money	0 (0%)	2 (8%)	0 (0%)	0 (0%)
Having their husband's support	4 (17%)	1 (4%)	3 (6%)	0 (0%)

[i] Numbers are presented as n (%).
[ii] Responses come from open-ended questions.

Only a few of the leader and beneficiary mothers mentioned that there were lessons that would be difficult for them to implement. Two leader mothers said that resting after giving birth would be hard since they did not have help and they had a lot of work to do. Beneficiaries interviewed following their BMCG primarily referred to the lessons related to having a balanced diet (3/48, 6%), complementary feeding (1/48, 2%), and hygiene (1/48, 2%) as being challenging to put into practice. Reasons given in response to open-ended questions were that either they lacked the resources or food (4/48, 8%) or had

issues with the cost of implementing a particular practice (1/48, 2%). Beneficiary mothers interviewed at home were a little more likely than those interviewed at the BMCG to report difficulty with implementing what they learned in their BMCG; they primarily mentioned building a bathroom (5/72, 7%), having a handwashing station (4/72, 6%), building a dish rack (4/72, 6%), and vaccinating children (2/72, 3%) as being difficult to implement at home. The reasons they gave were lack of time (4/72, 6%), lack of means/poverty (3/72, 4%), and sometimes lack of understanding the lessons (2/72, 3%). A couple of women (2/72, 3%) also mentioned that the task was too difficult for them to implement at home. One of the women who mentioned that getting vaccinations for her child was a hard lesson to implement said that it was because she could not read or write, which therefore made it hard for her to follow the vaccination schedule.

Assessed Feeding, Care, and Health Practices

All of the children of the beneficiary and leader mothers interviewed at home reportedly began receiving breast milk on their first day of life and almost all of the mothers had begun breastfeeding their child within the first hour of life, as recommended (**Table 3.35**). In addition, the majority of leader and beneficiary mothers interviewed with children under 6 months of age had exclusively breastfed their children for the previous 24 hours, which is also in line with the recommendation promoted by Tubaramure (Table 3.35). The vast majority of leader and beneficiary mothers with older children also reported that they had not begun giving their children liquids or foods other than breast milk until their children were 6 months of age or older (Table 3.35). These results are in accordance with the maternal knowledge findings presented in the previous section on health and nutrition knowledge.

Program participants' breastfeeding practices are largely in line with the recommendations taught in the program. However, their complementary feeding practices could be improved. Leader and beneficiary mothers typically began giving their children semi-solid foods at 7.2 and 7.5 months of age, respectively, which is later than the ideal introduction of complementary foods at 6 months of age. In addition to introducing foods later than recommended, fewer than half of the leader or beneficiary mothers reported giving their children between the ages of 6.0 and 8.9 months semi-solid or solid food two or more times in the past 24 hours. About three-quarters of the leader mothers that had children between the ages of 9.0 and 23.9 months of age did feed their children semi-solid or solid foods three times in the past 24 hours, in accordance with the minimum meal frequency for that age group (WHO 2008). However, fewer than half of the beneficiary mothers fed their children between the ages of 9.0 and 23.9 months the minimum recommended three times in the past 24 hours (Table 3.35).

Table 3.35. Nutrition Practices of Tubaramure Program Children Sampled[i]

	Leader mothers	Beneficiary mothers
Breastfeeding		
Child ever breastfed	23 (100%), n = 23	70 (100%), n = 70
Early initiation of breastfeeding (< 1 hour of birth)	22 (96%), n = 23	67 (96%), n = 70
Exclusive breastfeeding in the past 24 hours	3 (100%), n = 3	15 (88%), n = 17
Complementary feeding		
Month of age of introduction of non-breast milk liquids	6.5 (0.7), n = 21	6.2 (1.2), n = 17
Month of age of introduction of semi-solid foods	7.2 (1.0), n = 19	7.5 (1.7), n = 52
Children 6.0–8.9 months of age that received 2 meals in the past 24 hours	2 (40%), n = 5	5 (38%), n = 13
Children 9.0–23.9 months of age that received 3 meals in the past 24 hours	11 (73%), n = 15	13 (39%), n = 33

[i] Numbers are presented as n (%) or mean (SD).

The majority of mothers reported washing their hands before eating, after using the toilet, and before feeding a child. Only around one-third of the mothers, however, washed their hands after cleaning a child who had defecated. These findings are very similar to the handwashing knowledge shown in the previous section regarding health and nutrition knowledge. Most mothers reported that they had changed their handwashing practices in response to the BCC lessons received through the Tubaramure program (**Table 3.36**).

Every beneficiary household observed had a latrine in place for the family, but not all had built handwashing stations. Leader mother households, on the other hand, had both a latrine and a handwashing station (Table 3.36).

Table 3.36. Water and Hygiene Practices among Beneficiary Households[i]

	Leader mothers (n = 24)	Beneficiary mothers (n = 72)
Hygiene practices; % that reported washing their hands:		
Before eating	21 (88%)	53 (74%)
After using the toilet	21 (88%)	67 (93%)
Before feeding a child	16 (67%)	49 (68%)
After cleaning a child who had defecated	9 (38%)	23 (32%)
Before preparing meals	5 (21%)	13 (18%)
Changed their handwashing practices since starting the Tubaramure program	22 (92%)	60 (83%)
Household observation		
Households with a latrine	24 (100%)	72 (100%)
Households with a handwashing station	24 (100%)	60 (83%)

[i] Numbers are presented as n (%).

The majority of leader and beneficiary mother households were observed to have at least one bed net, and almost all Tubaramure mothers and children with bed nets had slept under one the night before (**Table 3.37**). Almost 70 percent of the leader mothers and about half of the beneficiary mothers reported having changed their bed net practices since joining the Tubaramure program. One woman said, "Today we put a mosquito net to protect against the mosquitoes thanks to the lessons from Tubaramure." Another commented, "Before Tubaramure, we had mosquito nets, but we only used them sometimes."

Table 3.37. Household Bed Net Practices among Beneficiary Households Sampled[i]

	Leader mothers	Beneficiary mothers
Households with one or more bed nets inside the house at the time of the interview	15 (71%), n = 21	53 (78%), n = 68
In households owning at least one bed net		
Beneficiary mothers that slept under the bed net the night before	14 (93%), n = 15	47 (89%), n = 53
Beneficiary children that slept under the bed net the night before	14 (93%), n = 15	46 (90%), n = 51
Reported changing their bed net practices since starting the Tubaramure program	16 (67%), n = 24	30 (42%), n = 72

[i] Numbers are presented as n (%).

All of the leader mothers and the majority of beneficiary mothers interviewed at home had taken their children under 24 months of age for at least one GMP visit since birth (Table 3.19). Nearly all of the leader mothers had also taken their child for at least one visit in the past 4 months, whereas only about two-thirds of beneficiary mothers had done the same. Only about one-third of leader mothers and 11

percent of beneficiary mothers had taken their children for the recommended four visits over the past 4 months.

Almost three-quarters of the leader mothers and beneficiary mothers reportedly attended at least four prenatal visits during their pregnancy, as recommended. The majority also said that they had delivered their babies at either a hospital or a health center, as opposed to delivering at home. Seeking postnatal care was much less common than seeking prenatal care; only about half and one-quarter of leader mothers and beneficiary mothers interviewed at home, respectively, had attended a postnatal visit within 6 weeks of birth (Table 3.21).

3.3.3. Conclusions Related to the Knowledge–Adoption of Essential Nutrition and Hygiene Practices Pathway

The steps along this pathway were being implemented as planned. The THP were hired and trained by CRS and FH and then, in turn, trained the leader mothers as outlined in the program design. They delivered high-quality training sessions for the leader mothers that were observed to be interactive, engaging, and technically sound. Leader mothers enjoyed participating in these sessions and reported that they valued what they learned. However, on average, they had attended only six rather than eight LMCG as expected by the program design. While leader mothers reportedly held their BMCG, observations of the sessions demonstrated that the leader mothers did not have the same level of technical expertise or teaching skill as the THP did. Providing additional opportunities for leader mothers to practice teaching what they learned could help improve the quality of the BMCG. Better-quality BMCG would likely improve beneficiaries' understanding of the topics being discussed, and could possibly increase attendance. Although all of the beneficiaries interviewed said that they had attended at least one BMCG, they had attended only an average of five of the required eight sessions over the past 4 months.

Knowledge of hygiene-related topics and use of related practices was generally high among both beneficiary and leader mothers. This is not surprising because these were among the first topics introduced in the care group sessions, and the building of latrines, handwashing stations, and dish drying racks were strongly encouraged by the Tubaramure program. Although hygiene-related knowledge was generally high, beneficiaries should be reminded about the importance of washing hands after cleaning a child who has defecated.

Optimal breastfeeding practices were also well known and largely practiced by the leader and beneficiary mothers interviewed. However, complementary feeding practices were less well known and practiced. Complementary feeding generally began after 7 months of age, and fewer than half of the children between the ages of 6.0 and 8.9 months received the minimum of two meals in the past 24 hours recommended for this age group. Although the majority of leader mothers that had children between the ages of 9.0 and 23.9 months fed their children at least the minimum of three times in the past 24 hours, fewer than half of beneficiary mothers did the same. The delayed introduction of complementary foods coupled with suboptimal meal frequency puts these children at risk of becoming malnourished. The importance of giving children more food and liquids during illness and recovery was also not widely known among the leader or beneficiary mothers, although the THP did seem to be familiar with the importance of increasing not only breast milk during illness and recovery but also food.

Adequate complementary feeding practices and optimal practices related to feeding children during illness and recovery should be more strongly encouraged by the Tubaramure program. Messages related to complementary feeding and feeding during illness and recovery should be immediately and widely disseminated. It is essential that beneficiary mothers learn about optimal practices while their children can still benefit from them. Messages related to giving children more breast milk than usual when they are

sick or recovering from an illness should be provided to all mothers of children under 24 months of age. In addition, mothers should begin learning about optimal complementary feeding practices before their children reach 6 months of age to ensure the timely introduction of complementary foods as well as other optimal complementary feeding practices.

While definite strengths were discovered along this pathway, especially with the high level of knowledge and skill among the THP interviewed, it was clear that as knowledge passed down the chain, from THP to leader mothers to beneficiary mothers, that a smaller proportion was generally familiar with the ideal practices, with the exception of some of the hygiene-related issues and topics related to breastfeeding.

4. Recommendations

This section consists of recommendations to Tubaramure program management to increase Tubaramure's potential for optimal impact on improving maternal and child health and nutrition outcomes.

4.1. Availability–Consumption Pathway

Given that the program components along the ***availability–consumption pathway*** related to the food distribution process were generally being implemented and utilized as planned, there are few recommendations for program improvements along this pathway. The two recommendations presented relate to (1) improving the utilization of the food commodities for children between 6 and 24 months of age and (2) the continued promotion of the production and use of locally available micronutrient-rich foods.

Improve utilization of food commodities for children between 6 and 24 months of age. Given the extremely high participation in food distribution events, they may present a good opportunity to provide beneficiaries with simple, illustrated, key take-home messages related to optimal health- and nutrition-related practices. This would not be used as a teaching time, but rather as a time when simple illustrations with key messages could be distributed and reinforced. These messages should reinforce those that are taught in LMCG and BMCG. Two key messages that should be immediately and widely disseminated among the beneficiary population are that:

- Children should begin receiving complementary foods, including CSB, at 6 months of age.
- Children should be fed enough times to meet their nutritional needs according to their age.

These messages and some corresponding materials already exist within the BCC materials created by FH and CRS. The best ways to disseminate these messages should be discussed among the consortium members and implemented as soon as possible.

Continued promotion of production and use of locally available micronutrient-rich foods. Promoting the production and use of locally available micronutrient-rich foods, which can be used in combination with the CSB and oil provided by the program, can improve the dietary intake of beneficiary mothers, their children, and other household members, not only now, but also after the micronutrient-rich food commodities are no longer available. About half of the leader and beneficiary mothers interviewed at home had home gardens, and some of the beneficiary mothers stated that they had created these home gardens since joining Tubaramure. This practice should continue to be encouraged, and the inclusion of micronutrient-rich fruits and vegetables in these home gardens that can be mixed with CSB to create an enriched porridge should be promoted.

4.2. Knowledge–Use of Preventive Health Care Services Pathway

Evaluation of this pathway focused on the provision of quality preventive health services at the district health centers and utilization of these services by the beneficiary population. Four potential areas for improvement stood out along this pathway.

- The first was the need to improve the training and associated health- and nutrition-related knowledge among nurses and CHW.
- The second was the need to improve the specific training for CHW in the use of the MUAC tape to screen children for severe acute malnutrition. This improved training should then be used to train any other program implementers expected to use this method (e.g., leader mothers).

- The third was the need to improve the provision of health and nutrition advice given by nurses during preventive health visits, especially for those that have been identified as being malnourished or at risk of becoming malnourished.
- The fourth was the need to increase coverage of home visits by well-trained CHW for pregnant and lactating women and households with children under 2 years of age.

Improve training and associated health- and nutrition-related knowledge among nurses and CHW. Both nurses and CHW stated that they wanted to receive more training and liked to learn and increase their knowledge. Their motivation to participate in training should be capitalized on because there were a number of topics covered in Tubaramure's BCC strategy that the nurses and CHW could use further training on. These topics include:

- Danger signs during pregnancy
- Danger signs during childhood illness
- Feeding during illness and recovery
- Timing of the introduction of complementary foods (for CHW only)
- The importance of washing hands before feeding children that have defecated

In addition, they requested further training related to HIV and IMCI because these proved to be the most challenging topics for them to understand.

Improve training for CHW in the use of the MUAC tape to screen children for severe acute malnutrition. Currently, the CHW are expected to use the MUAC tape to screen children for severe acute malnutrition. All but two of the CHW interviewed said that they were familiar with this technique, but the results indicated that, in general, they did not know how to correctly read the measurements from this tape. Practical demonstrations, standardization exercises, and ultimately verification that the CHW, or any other program implementer expected to use this method, knows how to accurately use this method should be included in the training sessions.

Improve provision of health and nutrition advice given by nurses during preventive health visits. Preventive health services at the observed district health centers were being provided, and nurses were following many of the technical steps required for prenatal and GMP services. However, very few of them gave pregnant women or mothers of children under 24 months of age any health- or nutrition-related advice during these visits. Although it seems that the nurses face time constraints, this shortfall does need to be addressed. At a minimum, those identified as being severely malnourished or at risk for becoming malnourished should be given some health- and nutrition-related advice at the time of their preventive health visits. Recordkeeping on children's yellow health cards could also be improved and should be encouraged.

Increase coverage of home visits by well-trained CHW for pregnant and lactating women and households with children under 2 years of age. Lastly, the home visits provided by the CHW seem to be yet another way that women and children living in Cankuzo and Ruyigi could learn about optimal health- and nutrition-related practices. Higher coverage of the beneficiary population with home visits by well-trained CHW could contribute to increasing the adoption of optimal health- and nutrition-related practices and, in turn, potentially contribute to improvements in maternal and child health and nutrition outcomes.

4.3. Knowledge–Adoption of Essential Nutrition and Hygiene Practices Pathway

The results related to the program components along the ***knowledge–adoption of essential nutrition and hygiene practices pathway*** were quite favorable in some areas and were identified as needing some improvement in others. The THP stood out along this pathway as being not only highly knowledgeable in the topics that should be covered in the LMCG and BMCG but also good facilitators of LMCG, employing a number of adult education techniques when providing training.

The areas that were identified as needing some improvement along this pathway relate to (1) improving attendance at, and quality of, the BMCG and (2) improving health- and nutrition-related knowledge and practices, especially with regard to complementary feeding.

Improving attendance and quality of BMCG. To improve the quality of BMCG, leader mothers could benefit from both continued technical training and receiving more training related to adult education techniques, because their facilitation of the BMCG was not nearly as good as that of the LMCG by the THP. More opportunities to practice what they learn and how best to convey the lessons could also enhance their ability to provide high-quality BMCG. The ability to provide higher-quality and more dynamic BMCG may increase attendance at the BMCG and increase understanding among those in attendance.

Improve health- and nutrition-related knowledge and practices, especially with regard to complementary feeding. While leader and beneficiary mothers' health- and nutrition-related knowledge and practices were good in some areas, they were sub-optimal in others, indicating that they had probably not formally learned about those topics yet. One specific message that appeared to need reinforcement was the importance of washing hands after a child has defecated. Beneficiaries should be reminded of the important handwashing times, with a specific emphasis on washing hands after cleaning a child who has defecated.

A general area that stood out was complementary feeding. Some of the key areas that require immediate attention are the timing of the introduction of complementary foods, meal frequency for children 6–24 months of age, and feeding children during illness and recovery. Although these lessons will likely be covered in the coming year in BMCG and LMCG, it is essential that beneficiaries with children under 24 months of age begin learning about these topics as soon as possible. Enhancing the dissemination of key messages related to complementary feeding should be a priority, as many beneficiaries may leave the program without having learned enough about complementary feeding.

5. References

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